

Small-holder credit: roles of farmers, government and private sector

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List of abbreviations

CDO	Cotton Development Organisation, Uganda
CFC	Common Fund for Commodities
CPHP	Crop Post Harvest Programme (RNRKS, DFID)
CPP	Crop Protection Programme (RNRKS, DFID)
DFID	Department for International Development, UK
FAO	Food and Agriculture Organisation of the United Nations
IFPRI	International Food Policy and Research Institute
ISNAR	International Service for National Agricultural Research
NGO	non-governmental organisation
NR	natural resources
NRI	Natural Resources Institute
NRPAD	Natural Resources Policy and Advisory Department (of DFID's predecessor, the Overseas Development Administration)
ODI	Overseas Development Institute
OPM	Oxford Policy Management
RNR	renewable natural resources
RNRKS	Renewable Natural Resources Knowledge Strategy
UGEA	Uganda Ginners and Exporters Association

Executive Summary

The project purpose was to develop and promote efficient and effective crop marketing and credit systems. It focused on the use of credit to improve access by resource-poor farmers to productivity-enhancing purchased farm inputs. Two cotton input credit schemes were studied in detail, both still in a state of evolution and development. Each has coverage far in excess of any other formal sources of credit available to smallholders (60,000 farmers in Zimbabwe and 300,000 farmers in Uganda). They are particularly interesting, moreover, because both are private sector initiatives, and the Uganda example has especially strong poverty focus.

The project activities comprised field work in Uganda and Zimbabwe, focusing on the cotton credit schemes and potential application in other sectors, workshops, and the production and distribution of dissemination outputs.

Although very different, both credit schemes studied have novel features. The cotton schemes in Zimbabwe are almost state-of-the-art examples of best practice in lending to smallholders, using a number of measures to facilitate and coerce repayment by smallholders. The programme is strictly commercially-run, and focuses on the more productive farmers. By comparison, the Uganda programme seems clumsy and paternalistic, with the cotton ginners taking responsibility for an input loan, and inputs distributed “free” to farmers. Costs are recouped via a uniform deduction in the price farmers receive for their seed cotton, but the ginners are contractually responsible for repayment, with each contributing on the basis of individual volumes ginned. Yet, the scheme has many advantages. It promotes cotton production, where farmers do not have sufficient cash to pay for inputs and where individual farmer loan programmes are unlikely to work (earlier attempts at this resulted in farmers simply selling their crop to other ginners to avoid repayment). Moreover, although input “hand-outs” are not the best way to promote their efficient use by farmers, the programme does have extremely large coverage amongst resource-poor farmers. (In Uganda, less risk-averse, better-resourced farmers would not choose to grow cotton).

The research and the workshops made an extremely timely contribution to current debate in both countries where, for different reasons, smallholder access to purchased inputs is receiving a lot of attention. The workshops also highlighted a number of other measures to improve access to inputs – both complements and alternatives to credit.

The work has generated a good deal of interest in the two countries concerned, and elsewhere. In addition to the planned distribution of dissemination outputs, there have been unsolicited requests for presentations and/or copies of relevant publications, and the research has already been cited in other work. Extra dissemination outputs have been produced.

However, the main channel for uptake of results is through contribution to policy development in Uganda, Zimbabwe and elsewhere (for instance, by informing the Programme for the Modernisation of Agriculture, in Uganda), and by the development of new projects and initiatives which build on the research. The prospects for this appear promising in both countries, with new work under discussion with DFID, FAO and in-country collaborators.

Background

The research described here sought to investigate the conditions under which the private sector will extend credit to smallholders in Africa. In particular, it explored scope for co-operation between traders or processors to achieve quasi-crop purchase monopolies (such that farmers cannot avoid repayment of input loans) and the use of other mechanisms (including group lending, and private/public co-operation) in support of sustainable farm input credit schemes.

Historically, increases in agricultural output in sub-Saharan Africa were largely attributable to the expansion of cultivated area – through destruction of forest and cultivation of increasingly marginal areas. However, the scope to convert new lands has declined and it is now widely accepted that further production increases can only come (with a few exceptions) from more intensive production (see for example, Badiane and Delgado, 1995, Marter and Gordon, 1996, Lipton, 1988).

Whilst some intensification is achievable using farmers' own inputs, there is also an important role for purchased inputs – particularly improved seed and inorganic fertiliser. Prior to the economic reforms that have swept through most of Africa in the last 10-15 years, many farmers had better access to purchased inputs than they do now (though this is not to imply that this situation was sustainable or problem-free). For instance:

- over-valued exchange rates made imported inputs seem less expensive
- commodity marketing boards often operated crop purchase monopolies which made it relatively easy to collect on input loans advanced to farmers
- credit and inputs were often subject to public sector subsidies, and
- governments often provided agricultural marketing, extension and input services.

The adjustment vision was that an appropriate enabling environment, with less state intervention and economic distortion, would unleash the commercial sector – such that farmers would benefit from access to new markets and privately provided services. Yet the reality is that commercial activity has been highly selective and often disappointing. Those farmers most in need of productivity increases are those least able to pay for inputs. Devaluation, a more limited sphere of state activity, and tighter controls on loan programmes, have reduced access to inputs.

“The nature of the challenge is not so much one of prices, although relative price changes have undoubtedly exacerbated the difficulties in recent years. Rather, it is that the majority of smallholders cannot afford to purchase adequate quantities of seasonal inputs on a cash basis at the start of the production season” (Poulton *et al.*, 1998, p42).

There has been considerable work on issues affecting smallholder access to credit - but significantly less focused on private sector mechanisms for credit within the current liberalised market context in sub-Saharan Africa. There has, nonetheless,

been an expectation that the private sector would fill the gap left by the withdrawal of the public sector - and provide more efficient cost-effective services. However, there is growing concern and evidence that in Africa's capital-scarce economies, there are a number of factors (including risk and high transactions costs) which inhibit private sector investment in the agricultural sector. Policy-makers are increasingly stressing the need for a judicious mix of state and private intervention - where the former works in support of the latter:

“Development - economic, social, and sustainable - without an effective state is impossible. It is increasingly recognised that an effective state - not a minimal one - is central to economic and social development, but more as partner and facilitator than as director. States should work to complement markets, not replace them.” (World Development Report, 1997, p18).

The idea of complementarity of action is echoed in the investigation of farmer-controlled enterprise and access to services, by NRI and the Plunkett Foundation:

“One area where assistance might be justified is in developing and piloting new institutional arrangements between companies, banks and smallholders which are mutually acceptable in terms of risk-sharing and the distribution of benefits”. (Stringfellow *et al.*, 1997).

The research reported here builds on three main areas of work:

- it is informed by the now considerable literature on rural finance, and the development of viable credit programmes (this literature is summarised in Goodland *et al.*, 1999)
- it complements recent research by Wye College on interlocking markets (Dorward *et al.*, 1998), and
- it draws on the NRI/Plunkett Foundation work on farmer controlled-enterprise (Stringfellow *et al.*, 1997), as well as other work on producer groups and access to rural services.

The specific case studies were identified during the course of earlier research by the project leader on agricultural markets in Zimbabwe and Uganda (Gordon, 1997a and 1997b). However, in a broader sense, the demand for the research is evident in the growing concern about farmer access to rural services in post-liberalisation Africa. This concern is evident in, for instance:

(a) DFID's focus on credit in the CPHP, and in other programmes (for instance, the Policy Research Programme focus on the delivery of agricultural services);

(b) the results of research funded under those DFID programmes (for instance, Poulton *et al.*, 1997, stress the prevalence of credit market failure in small-holder agriculture, and the need for further work in this area, and Stringfellow *et al.*, 1997 similarly focus on the need for more work on “...developing and

piloting new institutional arrangements between companies, banks and smallholders...”);

(c) in Uganda, credit is seen as a critical component in the response to the President’s call for the “modernisation” of agriculture (1997)

Project Purpose

The purpose of the research was the development and promotion of efficient and effective marketing and credit systems.

The project analysed two unusual private sector farmer credit schemes and identified key factors affecting viability. Both schemes demonstrate potential to enforce repayment in the absence of crop purchase monopolies.

The case studies yielded information on critical factors affecting the viability of credit schemes and mechanisms to screen borrowers, monitor and enforce repayment. This information can be used with data on the characteristics of other small-holder crop sectors (structure of primary output, market players, functions, asset profile, access to working capital, linkages) to identify sectors where (a) there is a need for credit (b) a source of funds for credit, and (c) conditions which favour the application of the lessons from the case studies.

Research Activities

The project activities were focused on the achievement of four principal outputs:

- (i) critical analysis of cotton sector farmer credit schemes in Uganda and Zimbabwe
- (ii) review of potential applications of these models to other commodity sectors
- (iii) stakeholder workshops, and
- (iv) dissemination outputs

The first activity was the collection of background information on smallholder credit programmes and the agricultural sectors in Uganda and Zimbabwe. This was an essential part of the planning and preparation of field work. It was carried out in the UK, through review of secondary data, correspondence and discussions with key individuals in Uganda or Zimbabwe, and contact with others who had recently worked there.

Field work was conducted in Uganda and Zimbabwe during September – November 1998, by Andrew Goodland and Ann Gordon (both economists at NRI). Field assistance was provided in Uganda by Rosetti Nabbumba of the Economic and Policy

Research Centre at Makerere University, and in Zimbabwe by Taswell Chivere of the Cotton Company of Zimbabwe. Joanne Mhunduru, Crop Post-Harvest Research Programme Co-ordinator, also provided invaluable advice on the work programme and suggested contacts in Zimbabwe. Many other individuals and organisations contributed to research and discussions, and these are listed in the field work reports (Goodland, 1999a and Goodland, 1999b, submitted together with the present report).

Detailed studies of the cotton credit schemes were undertaken (output 1). In Uganda, the scheme involves the distribution of “free” seed and chemicals to farmers, financed by a loan taken out jointly by the ginners. The costs are recouped from farmers by a uniform reduction in the price ginners pay for seed cotton, and from ginners on the basis of individual volumes ginned. The work in Uganda involved interviews with farmers, extension agents, ginners (including representatives of the Uganda Ginners and Exporters Association), staff of the Cotton Development Organisation and the Agricultural Policy Secretariat, donors, NGOs, farm input suppliers, banks, and others working in agricultural or rural development, as well as review of relevant data on cotton production and ginning.

In Zimbabwe, two of the three cotton companies run independent farmer credit schemes, in which credit advanced as inputs is deducted from the price received for subsequent sales of seed cotton. The work in Zimbabwe involved interviews with a similar group of stakeholders, but included in addition the Zimbabwe Farmers’ Union (which is much more active than its approximate counterpart in Uganda, the Uganda National Farmers Association), and the third cotton company, which deliberately declines to operate a smallholder credit programme.

In both countries information was also collected on the experience with smallholder credit in other sectors. In addition, potential application of the cotton models to other sub-sectors was explored, drawing on preliminary analyses of the factors governing the performance of the cotton programmes (output 2), and interviews with commercial sector stakeholders involved in the purchase of other smallholder crops.

The field studies in both countries yielded new information on smallholder credit (novel approaches to smallholder credit are being developed in both countries). However, the field work pointed up much wider interest in interventions that improve smallholder access to purchased inputs (both alternatives and complements to credit). In response to this, it was decided that the stakeholder workshops (output 3) should not only focus on credit mechanisms – but should also cover other issues affecting smallholder access to inputs.

Stakeholder workshops were conducted in February and March 1999. Each workshop included invited contributions on various aspects of smallholder access to farm inputs, working groups, and a plenary session at which group findings were presented and conclusions developed. Participants included: cotton sector representatives; companies involved in the purchase of other smallholder crops; input supply companies; farmer organisation representatives; extension agents; NGOs and projects involved in smallholder credit and input programmes; donors; researchers; and agricultural sector policy-makers. The workshop proceedings (Gordon and Goodland, eds., 1999a and 1999b) are submitted along with the present report.

Activities in support of dissemination commenced once the initial field work was complete. These activities included: the production and distribution of formal dissemination outputs; stakeholder participation in workshop planning, presentations; debate and proceedings; informal discussions and planning of potential follow-up to the research. (The latter was not funded by the project, but is noted here because of its importance in the dissemination process). Full details of dissemination outputs are provided in the next section.

Planned inputs were achieved. The finalisation of the workshop proceedings was brought forward, however, because of intense interest in the topic. The workshops had attracted enthusiastic participation, and made a timely contribution to current debate in both countries, where for different reasons smallholder access to inputs is a key commercial and policy priority. In view of this, permission was obtained to vire some funds from in-country costs (the direct costs of the workshop and local consultancies were less than anticipated) into staff costs, and extend the reporting period by two months, to produce additional dissemination outputs.

Outputs

Analysis of the cotton sector credit programmes in Uganda and Zimbabwe

The first output from the project was a critical review of the cotton sector credit programmes in Uganda and Zimbabwe. Box 1 summarises the characteristics of the cotton sectors in each country (essential background to an understanding of how the credit programmes have developed). The motive for the credit programmes is similar in both countries: a desire to increase small-holder production, in order to achieve higher levels of ginning plant utilisation. In Zimbabwe, the large-scale commercial farmers are now supplying less cotton as they shift into more lucrative commodity sectors (such as high value horticulture). In Uganda, there has been large-scale recent and relatively sudden private investment in the ginneries, following liberalisation of the sector. Cotton grown in tropical zones is particularly prone to pests, and in both countries, an input credit programme (covering expensive chemicals particularly) is regarded by many as an essential ingredient in promoting cotton production by smallholders¹. In Uganda, low yields and bitter memories of low state-controlled prices and an unreliable voucher payment system, have resulted in a slow farmer response to the new marketing arrangements, underlining the urgent need for the new ginners to demonstrate their commitment to the crop, and help farmers overcome cash constraints in acquiring the necessary inputs.

In Zimbabwe, the former parastatal operated a relatively successful input credit programme. A comprehensive database, and a monopoly on purchases of seed cotton, made it easy to deduct the costs of inputs advanced, when farmers sold their crop. Following liberalisation, however, farmers were able to sell their crop to any of three cotton companies, and loan repayment rates fell dramatically from 98% (1992/93) to 79% (1994/95). Procedures were subsequently tightened (see Box 3 for a description of the best practice measures adopted, and Annex 2 for more detail), such that repayment

¹ For completeness, Uganda's organic zone should be mentioned. Parts of Uganda produce certified organic cotton. Chemicals are not necessary here because of the presence of a beneficial black ant.

rates are now 100% (and 98% in the smaller but similarly-run scheme operated by one of the other companies). Interesting points about the Zimbabwean schemes are:

- their scale – they reach far more rural households than any other formal source of rural finance (a total of roughly 60,000 farmers in 1998/99)
 - the institutions (legal, political and cultural) which reinforce financial discipline and enable the companies to seize assets promptly in the event of default
 - their explicit commercial focus on the more able smallholders (who reliably repay and who normally achieve a certain minimum cotton yield)
 - the package of measures used to facilitate and coerce repayment, involving the farmer, his/her peers, and village-based and company monitors
-
- extreme confidence in repayment, such that some farmers are able to take out cash (not in-kind) loans
 - transport and bulk purchase arrangements with input companies which help reduce costs
 - innovative plans to graduate the best performers onto bank loans, thereby extending coverage at even less cost to the cotton company, and
 - a strict commercial focus on “value for money” – sticking with productive reliable farmers for whom the transaction costs are low and the returns high, and resisting the temptation to expand the scheme to cover a less reliable cadre of less productive farmers
 - development of these schemes without co-operation (information sharing) between the companies (which although ostensibly easy for just three companies, may not have occurred because the former parastatal, whose operations dwarf those of the other two, probably has more to lose than to gain from co-operation of this nature).

Box 1: How the cotton sectors of Uganda and Zimbabwe compare*Similarities*

- both have been producing cotton since the early part of this century
- both sectors were liberalised in 1994 – resulting in competitive crop purchase markets
- ginning capacity exceeds seed cotton production in both countries
- market and state reforms have led to changes in the availability of inputs for smallholders
- both sectors have received considerable donor/government support in the 90s
- the small-holder crop in both countries is unirrigated

Differences

- cotton production in Uganda is 100% smallholder; in Zimbabwe the large-scale commercial farmers produce roughly 1/3 of output
- cotton production in Zimbabwe is much higher than in Uganda (the 1997/98 Zimbabwean harvest was about 275,000 tonnes of seed cotton, compared with roughly 45,000 tonnes in Uganda in 1998/99)
- the agricultural sector is more developed in Zimbabwe with better infrastructure, a well-developed agro-processing sector, and more use of purchased inputs – but some of these services are geared to the large-scale commercial sector
- Uganda has a large number of cotton ginners (around 30), though a few large companies (5?) account for 50-60% of the cotton ginned; Zimbabwe has only three ginning companies, and one (the Cotton Company of Zimbabwe) dwarfs the other two
- In Zimbabwe small-holder cotton production has been increasing since the early 80s, whereas recovery in Uganda is more shaky and more recent
- Zimbabwe is a significantly higher income country than Uganda and commercial services are more developed in almost all sectors.

The Uganda scheme is quite different. By comparison with the Zimbabwe schemes it appears clumsy and inefficient. Yet it is also a pragmatic, stop-gap mechanism, which although suffering from several problems currently, has the potential (and inherent pressure) for improvement. The back-drop to the scheme was a poor farmer response to the recently liberalised sector, an urgent need to boost production, and disastrous repayment rates on the individual input credit schemes run by some of ginners (due to farmers avoiding repayment by selling to one of the other numerous cotton companies). The ginners formed an association, with compulsory membership by all companies, and jointly took out a loan to cover the costs of a minimal package of farm inputs (seed and sufficient pesticide for two sprays). Inputs are distributed to farmers, and the costs recouped in the first instance through a cess on the price farmers receive for their seed cotton, but with responsibility for repayment resting firmly with the ginners on the basis of volumes ginned by individual companies (verified by independent contracted monitors, and export licence applications). Annex 2 provides more detail. Nonetheless, there are a number of problems with the scheme:

- difficulties assuring the timeliness of input delivery
- diversion of inputs by intermediaries responsible for their distribution, or attempts to charge farmers for the inputs at the point of delivery
- inputs given out to non-cotton farmers and cotton farmers going without
- farmers using the inputs on other crops, or selling them
- too few spray pumps with which to apply the chemicals
- farmers deprived of the opportunity to make an informed decision based on the cost and benefits of pesticide application
- all cotton farmers selling seed cotton to Ugandan ginners², bar registered organic producers selling to specific ginners, pay equally for the cost of the scheme since it affects the price ginners can afford to pay for seed cotton³
- critics claim that the scheme is vulnerable to rent-seeking at all levels

Yet, it is also interesting and innovative in a number of ways, and points a way forward in situations where less (institutionally) complicated approaches to credit may not work. Interesting features of the Ugandan model include:

- its scale (reaching around 300,000 farmers) and poverty focus (cotton is now a low-risk, marginally profitable crop, unattractive to better resourced farmers, and grown partly because of benefits to following crops, and the timing of crop sales which coincide with Christmas and new school year expenditures)
- the potential it offers for input credit in situations where interlocking (of credit and crop sales) would not work (because of the market characteristics, and because of weak legal and political institutions for enforcing repayment), without removing the potential for competition between ginners (who use price to compete with one another for the farmer's crop)
- the key role played by the public regulatory board (the Cotton Development Organisation), using public and donor funds, to facilitate the establishment of the ginners association and its access to concessionary finance (in the first year only), advising on and co-ordinating the distribution of farm inputs, and helping establish mechanisms to monitor ginning volumes to ensure fair contributions to repayment of the input loan
- its precarious dependence (at least at the outset) on manipulating information – so, for instance, the first year of the scheme effectively involved a 50% subsidy⁴ because the ginners' contractual obligation was to repay at a certain rate per kg of seed cotton ginned (a higher rate would probably have been unacceptable to ginners and farmers alike), but the rate was based on a

² Unknown quantities of seed cotton are illegally exported to Kenya where significantly higher prices are paid. This probably affects the neighbouring districts more than other areas. Seed cotton is traded by the bag, loaded on bicycles. It is not clear whether there is any significant large-scale organised trade in seed cotton.

³ CDO and UGEA state erroneously that the cost of inputs is met 50:50 by ginners and farmers, and the seed cotton guide price is adjusted downwards to reflect the 50% contribution by farmers. However, there is intense competition for seed cotton, since all the gineries are operating well below capacity, and all are having to meet the costs of loans taken out for rehabilitation and modernisation. Farmers almost always receive more than the guide price and it appears that ginners pay as much as they can afford to secure their supplies of seed cotton.

⁴ excluding the cost of CDO's own inputs

grossly optimistic crop forecast, such that a government guarantee on the loan came into effect; footnote 3 provides another example of how information was manipulated

- the conditions under which ginners were willing to co-operate to achieve a common goal (there were probably more uniform gains from this, than might have arisen in Zimbabwe, but even so the co-operation was not always enthusiastic with CDO perhaps able to exert influence, and pressure from the larger ginners who also export on behalf of some of the smaller ginners)
- in-built commercial pressure for improved performance despite evident teething problems (the ginners are unlikely to tolerate an operation which on-goingly misses its target, particularly once the subsidy element is reduced)

Box 2 compares the performance of the contrasting input credit schemes.

Box 2: Summary of credit scheme performance

Performance criteria	Countries	
	Zimbabwe	Uganda
<i>Repayment</i>	High: 98%+	Effectively only 50% in 1 st year
<i>Farmer participation</i>	53,000 small-holders probably more able farmers	300,000 including many self-selecting resource-poor, risk averse farmers
<i>Efficient use of inputs</i>	No data available but inputs likely to be used efficiently because of: <ul style="list-style-type: none"> • monitoring and extension • farmers pay for inputs • inputs not significantly subsidised 	Evidence of significant “leakage” and inputs not necessarily available when needed in a form that farmers can use (ie too few spray pumps). Perverse incentives: efficient producers effectively pay more for their inputs, and less efficient more
<i>Dependence on subsidies</i>	Minor subsidy element only?	Major subsidy in 1 st year to be reduced in years 2 and 3. Scheme presently relatively high cost – and may collapse in the absence of subsidy
<i>Effect on seed cotton output</i>	Positive – particularly as focus seems to be on more productive farmers	Effect not clear – ginners nonetheless confident that scheme is necessary
<i>Wider development impacts</i>	Capacity-building with farmers and groups, empowerment	Wider impacts are limited – inherently paternalistic scheme, with benefits related directly to any increased income accruing to farmers
<i>Sustainability</i>	Appears sustainable: <ul style="list-style-type: none"> • subsidy is small • capacity-building • demonstrated ability to repay • process permits further development 	Questionable – unless costs can be significantly reduced, inputs more focused on intended beneficiaries, and dependence on subsidy reduced. Ginners nonetheless still confident – and likely to exert pressure for more efficient operation

Potential application of cotton input schemes to other sectors

The second project output was the identification of other sectors with scope for application of similar input schemes.

In post-liberalisation Africa, there has been considerable reflection on private sector reticence to provide services previously provided by the state. One of the areas that has suffered is small-holder access to inputs and credit. However, this research in Uganda and Zimbabwe illustrates that there are some very considerable successes – with very high farmer participation – that are significantly funded by the private sector (and are unarguably a private sector initiative). Although both of these case studies focus on cotton, a number of more generic lessons can be drawn.

In the first instance, it is possible to identify the conditions under which credit is likely to be offered. The main reason for offering credit is to address some kind of supply constraint:

- assuring supplies of appropriate quality, volume, regularity and price
- reducing costs of acquiring raw material
- keeping markets or plant supplied at levels which assure viability, future market access or desired market share
- protecting long run raw material supply.

Small-holder credit programmes are risky and administratively onerous, and in the absence of any need to improve the supply of raw material (in various ways), traders or processors are unlikely to offer farmers production credit.

Secondly, farmer interest in participating in a credit scheme will be influenced by:

- perception of benefits derived from use of inputs and market access
- scheme offers better/cheaper/easier access to inputs and/or credit
- farmer operates in context where s/he is able to plan ahead and willing/able to take some risk

Unfortunately, where there is a recent history of loan amnesties and default without penalty, farmers may not consider participation in the scheme to confer an obligation to make repayments. (The accessibility of the scheme will also influence farmer participation, but this is discussed below under viability and *modus operandi*).

Thirdly, providing there are incentives for crop purchasers to offer credit, and for farmers to take credit, it is possible to identify the factors which influence the viability of such input credit schemes. In Box 3 these are divided into: crop market characteristics; input characteristics; the overall commercial context; and *modus operandi* of the scheme.

So-called “killer assumptions” are also identified: where crop purchase monopolies persist, it is relatively easy to ensure repayment, but this situation is increasingly rare; it is generally less risky to provide inputs in-kind, but this does not provide a water-

tight guarantee that inputs will be used in the manner intended because their opportunity cost may be higher when applied to other crops or when resold.

Box 3: Factors which influence viability of crop input credit schemes		
Factors/aspect	Effect	
<i>Crop market characteristics</i>		
1. Crop purchase monopoly and no food/farm use of crop	+	*
2. Possible for all buyers/users to form association and no food/farm use	+	
3. Multiple marketing channels and/or food use	-	
<i>Input qualities</i>		
1. Inputs provided in-kind	+	
2. Limited alternative use or market for input	+	*
3. Returns to input use are greatest for the crop in question	+	*
<i>Commercial/credit context</i>		
1. Farmers treat farm as a business and are integrated into markets	+	
2. History of loan amnesties, default without penalty, subsidised inputs	-	
3. Supportive legal/political/contract enforcement institutions	+	
<i>Modus operandi of scheme</i>		
1. Group schemes for peer pressure	+	
2. Group or individual schemes backed up by monitoring/good information, support staff, and ability to act	+	
3. Incentives for repayment and penalties for non-repayment	+	
4. Appropriate incentives for field monitors/co-ordinators	+	
5. Training provided to farmers – extension and business management	+	
6. Developing relationship/trust/loyalty through field presence/contact	+	
7. Accessibility of scheme – minimise red tape and transaction costs; organise so location and timing of contact is convenient to farmers	+	
8. Effective and timely monitoring of input use and crop marketing	+	
<i>Note: * denotes killer assumption</i>		

The significance of these categories, and particular aspects, is that they need not all be present for a scheme to work, but most schemes will need to incorporate several aspects to ensure a degree of success. For instance, the Ugandan example relied on the buyers forming an association (crop market characteristic 2), but for the scheme to succeed it was also necessary for inputs to be provided in-kind, and to incorporate several measures from the *modus operandi* group (eg., monitoring, extension and accessibility). The scheme can then function, even if the overall commercial context is weak.

The research in Zimbabwe indicates that even when few favourable crop market and input conditions are present (fertiliser and cash (!) are available on credit in Zimbabwe), it is nonetheless possible to develop strong and viable input schemes. The success of the schemes in Zimbabwe is very dependent on the presence of favourable conditions relating to overall commercial context, and *modus operandi*.

The measures listed in the *modus operandi* group are essentially best practice in lending to small-scale farmers. They are carrot and stick measures – which do not depend solely on unrealistic assumptions about, for instance, the ability to enforce contracts using legal mechanisms (which even if possible, would probably be very transaction costs-intensive). These are the measures used in the Zimbabwe cotton credit schemes. Their focus on groups, training and the development of appropriate incentive systems makes them initially costly – but once in place, farmers can take on a greater share of these costs (groups can act as crop assembly points, distribution points for inputs, a vehicle for extension, and a means by which farmer participation in wider democratic processes can be encouraged – reducing the transaction costs inherent in reaching small-scale farmers). Moreover, these measures build group/individual capacity so that farmers are able to combine their knowledge of, for instance, land qualities and crop management, with information about inputs, and use this to make informed decisions about input use. Without capacity building such as this, technology packages tend to be inflexible (and therefore not ideal in all situations) or very costly in terms of extension (as seen, for instance, with some of the intensively-managed small-holder outgrower export horticulture schemes in Africa). Nonetheless, the implicit start-up costs, and the fact that the benefits are long-term (and also, far wider than just the crop in question) mean that they are only likely to be attractive to companies able to take a longer view.

Such best practice mechanisms in rural lending are robust to different situations. For instance, they are similar to the measures used by Grameen Bank type schemes – where inputs are not necessarily provided in-kind or targeted to a particular crop. This approach, moreover, yields benefits even where the marketing structure does not demand such an approach. (In Mali, for instance, the cotton parastatal⁵, which has a crop purchase monopoly, uses virtually all of these measures to reduce transaction costs and increase cotton output). There seems to be a clear lesson here for Uganda too: whilst it is difficult to envisage a preferable viable alternative to the existing scheme given current conditions and circumstances (and this is true, despite all the problems in the operation of the input scheme), it does not obviate the necessity and desirability of investment in longer term measures aimed at more sustainable and substantive improvements in small-holder productivity. At the same time, it may be more difficult still to get commitment to such long-term goals amongst a large group of companies, many of whom are reluctant participants in the current scheme (see below).

The possibility of creating a buyers' association seems to greatly expand the potential for viable commercially-provided small-holder credit. Yet, on closer examination, there are probably relatively few situations where this is likely to happen. In Uganda, it was administratively costly and time-consuming to organise such an association (the CDO played a key role in this, with the support of a small number of larger ginners,

⁵ The parastatal is in fact a hybrid, with a 40% share retained by The Compagnie Francaise pour le Developpement des Textiles.

but the smaller ginners were apparently reluctant partners). The larger ginners had most to gain from an increase in cotton output. They were able to exert pressure on the smaller ginners via the CDO (membership of the Uganda Ginners and Exporters Association is compulsory) and also because the larger ginner-exporters export some of the cotton ginned by the smaller companies. Moreover, all the ginners face similar problems and constraints – and no single company is privileged in the resources it has to tackle these issues. So although there are a few larger companies (which are substantially better-resourced/cushioned than the smaller ginners), these larger companies are on a fairly equal footing with one another. By contrast in Zimbabwe, a buyers' association (of just three cotton companies) would be relatively easy to organise – but there is little interest in doing so. The largest company (the former parastatal whose operations dwarf those of the other companies) undoubtedly has privileged access to information about individual farmers, farm output and repayment history. It appears to have judged its competitive advantage best-served by protecting this exclusive access to information (and devising alternative measures to combat the problems encountered in the wake of crop marketing liberalisation). Another factor which limits the potential to replicate the buyers' association approach is that it will only solve the problem of “side-selling” (farmers taking credit from one company and selling output to another) if the crop in question has no value on-farm or in local markets. This limits potential considerably – mostly to crops which need to be industrially processed (such as fibres and some oilseeds) or which are exclusively produced for export (such as tobacco, in some places).

In summary, the potential to use the buyers' association approach to credit seems to depend on:

- existence of mechanisms to exert pressure on laggards/reluctant partners
- a fairly level playing field between buyers (ie comparability in what they stand to gain/lose), and
- crop use options limited to those buyers (little food use or local marketing).

A number of complements and alternatives to input credit schemes were also identified (see below) which have application across many sectors.

Stakeholder workshops

Stakeholder workshops comprised the third project output. The starting point for this research was the need to increase smallholder productivity through improved access to purchased inputs. Credit was assumed to hold the key to this. However, in Uganda and Zimbabwe, although there was widespread interest in access to purchased inputs, many people stressed the role of non-credit factors, and some people were outspoken in their view that credit was often inappropriate. The stakeholder workshops conducted in Zimbabwe and Uganda therefore focused on the broader picture – looking at credit and other factors that influence access to inputs, as complements to credit or as alternatives. Five categories of factors were identified:

- affordability
- availability

- information
- risk and uncertainty, and
- commercial context.

For example, credit helps make inputs more affordable. However, affordability can also be improved by:

- timing of sales to coincide with times when farmers have cash (seen with cotton input sales in Zimbabwe)
- inputs sold in pack sizes suited to small producers (eg seed)
- lower prices, achieved by cost reductions in distribution and marketing (eg through bulk purchases, transport sharing arrangements, and farmers' groups taking on more responsibilities).

The physical availability of inputs in rural areas is also an important constraint, with thin and unreliable rural distribution networks in most African countries. Innovative projects in Uganda and Zimbabwe, seeking to promote the development of input stockist networks, were reviewed at the workshops.

Information constraints were highlighted by many people – be they in terms of information gaps (some basic research on fertiliser response for certain crops and soil conditions has not been undertaken) or information flows (accessing and disseminating this information). Innovative arrangements between farmers' organisations, extension agents, NGOs, input companies and output traders were reviewed – with particularly interesting examples from Zimbabwe. Improved information on input application is clearly needed – and extension makes an important contribution to the performance of input credit programmes.

The role of risk and uncertainty, and the overall commercial environment within which farmers operate, were also reviewed.

The wider lessons on input access are explored in a further output of the project (a publication in NRI's policy series, attached here at Annex 3).

The workshops made an extremely timely contribution to debate in both countries. There was considerable interest in the workshops and potential follow-up. In Uganda, the specific context for this is the Programme for the Modernisation of Agriculture. This is a current consultative process aimed at the development of appropriate policy and intervention to develop smallholder agriculture along more commercial and productive lines. It is accorded a high priority at all levels, with the term first coined in a speech by Museveni in 1997. In Zimbabwe, there is growing commercial and public sector focus on the communal farming sector.

Workshop proceedings (Gordon and Goodland, eds, 1999a and 1999b) are submitted together with this present report.

Dissemination outputs

The fourth output from the project was the preparation and distribution of dissemination outputs.

Formal dissemination outputs are listed in Box 4. Outputs 1, 2, 3, 4 and 6 were originally proposed, and outputs 5, 7, 8 and 9 are additional.

Dissemination of project outputs was also achieved by other mechanisms, notably relating to follow-up proposals. These are discussed in the following section.

Box 4: List and status of formal dissemination outputs	
Output	Status
1. Discussion papers on cotton credit programmes and other potential applications	Presented at workshops and included in workshop proceedings.
2. Workshop proceedings	Distributed to workshop participants and wider audience in March 1999. Copies of proceedings submitted together with present report.
3. Journal article on credit schemes	Currently under review with Savings and Development, with draft attached at Annex 2
4. Publication in NRI's policy series on smallholder access to purchased inputs	In press, with text attached at Annex 3.
5. A Development Issues paper (a shorter format series published by NRI and available on the web)	In press, with text attached at Annex 4.
6. Shorter articles intended for a wider audience, for publication in (eg), Spore and the bulletin of the Zimbabwe Farmers' Union.	Submitted, with example attached at Annex 5.
7. Paper presented at workshop on Agricultural Marketing Reform in southern Africa, organised by OPM and funded by DFID.	Presented July 1999, and attached at Annex 6.
8. Paper to be presented at seminar on New Development Finance, Goethe University of Frankfurt, organised by University of Frankfurt and The Ohio State University. Sponsored by USAID; DFID; Kreditanstalt fur Wiederaufbau (KfW); and 3 consulting companies.	In preparation, for presentation 27 September – 1 October 1999.
9. Journal article comparing experience with cotton input networks in Uganda with situation in India (drawing on CPP-funded research still in process)	In preparation, pending further data collection in India by NRI co-author

Contribution of Outputs

The goal of the DFID's Crop Post-Harvest Programme of the RNRKS is: "livelihoods of poor people improved through sustainably enhanced production and productivity of RNR systems". Its purpose is: "poor people benefit from new knowledge applied to food commodity systems". (When this project was approved the programme purpose gave less explicit emphasis to poverty reduction: "productivity and productive potential of selected production systems improved through reduction of post harvest losses and development of processing and marketing innovations").

This project sought to contribute to those aims through the development and promotion of efficient and effective marketing and credit systems, focusing particularly on the use of credit to improve access by resource-poor farmers to productivity-enhancing purchased farm inputs. Two credit schemes were studied in detail, both still in a state of evolution and development, that have coverage far in excess of any other formal sources of credit available to smallholders. Moreover, they are particularly interesting because both are private sector initiatives, and the Uganda example has especially strong poverty focus.

The project memorandum anticipated three principal mechanisms for dissemination and uptake of project results:

- (1) via the involvement of key stakeholders in the research and workshops
- (2) via publication of the research results, and
- (3) via uptake in the form of further work and projects.

In Uganda, the work has contributed to the longer-term consultative process concerned with the Programme for the Modernisation of Agriculture. Three people playing a key role in this process participated in the workshop. Two contributed papers, and the third helped with the planning of the workshop, and chaired one of the sessions. The workshop was also attended by other stakeholders who contributed to the debate.

At a more concrete-level, however, the research has contributed to, or led to the development of, several other initiatives in Uganda, for instance:

- DFID's private sector development adviser and the RNR adviser, in Uganda, asked the project leader to prepare two concept notes dealing with (a) seed supply and (b) fertiliser markets; this was a direct result of issues raised by the research; the concept notes were well-received and follow-up is anticipated, once new advisers are in post (both original advisers have now left Uganda);
- the cotton studies have been discussed with stakeholders in the sector (both private and public), and there is interest at Serere Agricultural and Animal Production Research Institute (which has the remit for cotton research), and the Cotton Development Organisation, in exploring longer-term farmer group-based approaches to extension and input supply; this was raised by the Ugandan collaborators in the context of other cotton sector work carried out by the project leader in June 1999; possible funding sources include DFID bilateral, DFID RNRKS, CFC, World Bank (in relation to current interest in extension models);
- the focus on smallholder access to inputs coincided with initiatives by USAID and FAO, who funded missions on fertiliser markets and soil fertility respectively, in late 1998; the results of all three studies have been shared, and discussions have been held with FAO on ways in which the NRI work can contribute to Uganda's Soil Fertility Initiative (FAO, 1999).

In Zimbabwe, agricultural input companies that attended the workshop, were interested in ways to extend their work with communal sector farmers. The DFID bilateral programme was also interested in this area, and the project leader was asked to prepare a

concept note on improving communal farmer access to soil fertility enhancing inputs in Natural Regions IV and V. This was well-received and a decision on further work is awaited pending revisions to the country NR strategy (expected September 1999).

The project outputs have also found a wider audience via distribution outside Uganda and Tanzania, and presentation at other workshops (for instance at Oxford Policy Management in July 1999, and the planned presentation at Frankfurt in September 1999). Unsolicited requests for talks (the OPM talk for instance) and copies of dissemination outputs (for example, from FAO, and TWIN Trading⁶), is evidence of genuine interest in the work and the effectiveness of prior dissemination activities. Moreover, the research is already being cited in other work (Poulton *et al.*, 1999).

Further development of the work is anticipated through further dissemination of research outputs, continuation of the project processes already initiated and described above, and incorporation of the findings into other new work in which NRI and other development organisations are involved (for instance, the work will be used in a forthcoming “best practice guide” on rural credit).

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Annex 1: List of other reports submitted to CPHP with final technical report

Goodland, A., 1999a, *Smallholder credit in Uganda: roles of farmers, government and the private sector. Report of field work conducted in Uganda during September and November 1998*. Chatham, UK: NRI.

Goodland, A., 1999b, *Smallholder credit in Zimbabwe: roles of farmers, government and the private sector. Report of field work conducted in Zimbabwe during October and November 1998*. Chatham, UK: NRI.

Gordon, A. and Goodland, A. eds., 1999a, *The use of purchased inputs by smallholders in Uganda. Proceedings of a workshop held at Mukono, Uganda 4-5 February 1999*, Chatham, UK: NRI.

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Publication in NRI's Policy Series – sample of format to be used for report at Annex 3 of Final Technical Report.

Publication in NRI's Development Issues series – sample of format to be used for text at Annex 4 of Final Technical Report.

Annex 2: article submitted to Savings and Development

Production credit for African small-holders: conditions for private provision¹

By Ann Gordon and Andrew Goodland, Natural Resources Institute, UK².

Abstract

It was hoped that market reforms in sub-Saharan Africa would unleash the private sector, such that farmers would benefit from access to new markets and dynamic privately provided services. The reality is that commercial activity has been highly selective and often disappointing. Many farmers face a deterioration in market access and services, including credit. This paper examines the conditions for private sector provision of production credit for smallholders. Drawing on recent field work in Uganda and Zimbabwe, it analyses the performance of two contrasting approaches to smallholder credit. These schemes have coverage far in excess of any other formal sector source of credit for smallholders (300,000 and 53,000 farmers respectively). The Zimbabwean scheme is an apparently commercially sustainable text book model of how to run such a scheme. The Ugandan scheme is paternalistic, institutionally complicated and subject to significant inefficiencies in its operation, but nonetheless a potentially significant improvement on the "without scheme" scenario. Of note also is the scale of coverage, and its strong poverty focus. The paper concludes with a discussion of generic lessons for other credit schemes and commodities.

¹ This publication is an output from a research project funded by the United Kingdom Department for International Development (DFID) for the benefit of developing countries. The views expressed here are not necessarily those of DFID. R7197, Crop Post-Harvest Research Programme.

² The authors are grateful to Alan Marter and Colin Poulton for comments received on an earlier draft.

1. Introduction

Historically, increases in agricultural output in sub-Saharan Africa were largely attributable to the expansion of cultivated area – through destruction of forest and cultivation of increasingly marginal areas. However, the scope to convert new lands has declined and it is now widely accepted that further production increases can only come (with a few exceptions) from more intensive production (see for example, Badiane and Delgado, 1995, Marter and Gordon, 1996, Lipton, 1988).

Whilst some intensification is achievable using farmers' own inputs, there is also an important role for purchased inputs – particularly improved seed and inorganic fertiliser. Prior to the economic reforms that have swept through most of Africa in the last 10-15 years, many farmers had better access to purchased inputs than they do now (though this is not to imply that this situation was sustainable or problem-free). For instance:

- over-valued exchange rates made imported inputs seem less expensive
- commodity marketing boards often operated crop purchase monopolies which made it relatively easy to collect on input loans advanced to farmers
- credit and inputs were often subject to public sector subsidies, and
- governments often provided agricultural marketing, extension and input services.

The adjustment vision was that an appropriate enabling environment, with less state intervention and economic distortion, would unleash the commercial sector – such that farmers would benefit from access to new markets and privately provided services. Yet the reality is that commercial activity has been highly selective and often disappointing. Those farmers most in need of productivity increases are those least able to pay for inputs. Devaluation, a more limited sphere of state activity, and tighter controls on loan programmes, have reduced access to inputs.

“The nature of the challenge is not so much one of prices, although relative price changes have undoubtedly exacerbated the difficulties in recent years. Rather, it is that the majority of smallholders cannot afford to purchase adequate quantities of seasonal inputs on a cash basis at the start of the production season” (Poulton *et al.*, 1998, p42).

In this post-liberalisation era, there is considerable interest in the conditions for increased private sector provision of agricultural services – including credit. This paper draws on research conducted in Uganda and Zimbabwe in 1998/1999, where production inputs are advanced to small-holders by private cotton companies which do not operate crop purchase monopolies. The remainder of the paper provides: a description of the input credit schemes in each country; comparative analysis of performance; and a discussion of lessons for other credit schemes and commodities.

2. Production input credit schemes for cotton farmers in Uganda and Zimbabwe

Box 1 summarises the similarities and differences between the cotton sectors of Uganda and Zimbabwe.

Box 1: How the cotton sectors of Uganda and Zimbabwe compare*Similarities*

- both have been producing cotton since the early part of this century
- both sectors were liberalised in 1994 – resulting in competitive crop purchase markets
- ginning capacity exceeds seed cotton production in both countries
- market and state reforms have led to changes in the availability of inputs for smallholders
- both sectors have received considerable donor/government support in the 90s
- the small-holder crop in both countries is unirrigated

Differences

- cotton production in Uganda is 100% smallholder; in Zimbabwe the large-scale commercial farmers produce roughly 1/3 of output
- the agricultural sector is more developed in Zimbabwe with better infrastructure, a well-developed agro-processing sector, and more use of purchased inputs – but some of these services are geared to the large-scale commercial sector
- Uganda has a large number of cotton ginners (around 30), though a few large companies (5?) account for 50-60% of the cotton ginned; Zimbabwe has only three ginning companies, and one (the Cotton Company of Zimbabwe) dwarfs the other two
- In Zimbabwe small-holder cotton production has been increasing since the early 80s, whereas recovery in Uganda is more shaky and more recent
- Zimbabwe is a significantly higher income country than Uganda and commercial services are more developed in almost all sectors.

The incentives to operate input credit schemes are similar in both countries: all ginning companies are dependent to some extent on seed cotton from smallholders to maintain ginnery utilisation rates; excess capacity in the ginning sector gives companies an added reason to seek ways to secure access to smallholder seed cotton; and, the general paucity of production services for smallholders threatens seed cotton production.

However, the input credit schemes have evolved differently, so that for the 1998/1999 season the schemes in the two countries used significantly contrasting approaches. The perennial problem in operating such schemes, in the absence of crop purchase monopolies, is default by farmers who deliberately “side-sell” their crop to an alternative buyer to escape repayment of input loans.

Uganda

The withdrawal of the state from free distribution of cottonseed for planting was recognised by ginners as seriously jeopardising seed cotton production, and therefore threatening the ginning sector. The initial response by one of the larger ginneries was to launch an ill-fated input credit scheme (for seed and pesticides). The scheme proved disastrous as the majority of smallholders defaulted on their loans, due to a combination of side-selling and a poor harvest (it was the *El Nino* year). Farmers

disregarded the agreements they had entered into with the cotton company and sold to other ginners offering higher prices. The cotton company making the loans found it impossible to enforce the purchase agreements, and attempts to seize assets proved unworkable.

In order to remove the possibility of side-selling, the Uganda Ginners and Exporters Association (UGEA) was formed, with compulsory membership of all cotton ginners. For the 1998/1999 season the UGEA financed the input credit scheme from a Bank of Uganda loan. In developing and operating the input credit scheme, a critical role has been played by the Cotton Development Organisation (CDO), a parastatal formed when the sector was liberalised, to provide co-ordination and regulatory services. The CDO has co-ordinated the distribution of cottonseed and pesticides. Smallholders are free to sell their seed cotton to any ginner. The ginners are responsible for loan repayment, and these costs are met through a levy payable against volumes of cotton ginned by each ginner. (Volumes are assessed by independent monitors assigned to each ginnery). Average (not individual) input costs are factored into the seed cotton price paid to farmers (and farmers receive the same price irrespective of the quantity of inputs supplied to the individual farmer³). The problem of side-selling has therefore been overcome by removing the option of selling to alternative buyers: all ginners are members of the UGEA so it is impossible for a farmer taking credit to sell to buyers outside of the scheme⁴. Levy avoidance by individual ginners has been reduced by the presence of monitors, and dialogue with border officials and spinning factories, where ginners (or farmers) may try to make illegal sales.

Zimbabwe

Unlike Uganda, there has been little co-operation between the three ginning companies in Zimbabwe. Out of the three companies, two operate input credit schemes (the Cotton Company of Zimbabwe (Cottco), and Cotpro). Both companies use a similar approach to overcome the problem of side-selling:

- All borrowers belong to groups of cotton smallholders. Default by one member of the group brings retribution to the whole group, which may be subsequently excluded from the scheme. This increases incentives to repay. It also encourages group members to monitor and help one another to ensure that there is no default.
- Groups performing well receive cash rewards.
- If defaulting occurs, the companies act swiftly and come down heavily on defaulters, seizing assets when necessary.
- Local agents of the cotton companies are in year-round contact with smallholders, building closer relationships and a sense of loyalty to the company⁵.
- Additional services are provided in addition to the input credit. Extension advice is provided, and the Cotton Company has recently introduced cash loans. Again,

³ The only exception to this arises in the context of farmers in the organic production area selling organic cotton to the certified organic ginner.

⁴ Unknown quantities of seed cotton are exported to Kenya where significantly higher prices are paid. This probably affects the border districts more than other areas. Seed cotton is traded by the bag, loaded on bicycles. It is not clear whether there is any significant large-scale organised trade in seed cotton.

⁵ Interestingly, this seems to work in the interests of the cotton companies in Zimbabwe. In Ghana, however, in the absence of cotton output-based incentives, cotton company field assistants and contact farmers ("chief farmers") were liable to register poorly performing farmers and shirk on monitoring duties (Poulton, 1998).

these additional benefits of “belonging” to a company help to strengthen relationships and loyalty.

3. Cotton input credit schemes: comparing performance in Uganda and Zimbabwe

Seven aspects of performance are considered:

- Repayment
- Farmer participation
- Efficient use of inputs
- Dependence on subsidies
- Effect on seed cotton output
- Wider development impacts, and
- Sustainability

Box 3, at the end of the section, summarises the discussion which follows.

Repayment

The input credit schemes operating in Zimbabwe reported very high levels of repayment by farmers in 1997/98: 98% for the larger of the two schemes, and 100% for the other scheme. The larger of these two schemes had suffered low repayment rates (79%) in the season immediately following cotton sector liberalisation (1994/95), prior to which the company had a monopoly on purchases of seed cotton. As a result, however, a number of steps were taken to reduce the risk of default (discussed in the previous section).

The input scheme in Uganda places the burden of repayment on the ginners, with the ability to repay dependent on the size of the farmers’ harvest. Thus UGEA negotiated a loan whereby repayment was promised at a given rate for each kilogram of seed cotton ginned, with a government guarantee provided to cover any difference between this and the aggregate amount borrowed. Given this formula, and the ginners’ need to acquire export licenses from CDO (and hence to declare volumes processed⁶), it is relatively straightforward to achieve reported repayment rates of 100%. However, the actual harvest in 1998/99 was around 80,000 bales of lint (compared with the forecast of 150,000 bales used in calculating loan repayments). The government guarantee was therefore necessary to cover roughly 50% of the repayment cost.

Farmer participation

The size of these programmes is impressive – and dwarfs any other rural credit scheme available in both countries. In Zimbabwe, 53,000 small-holders participated in the two schemes in 1997/98 (the larger of the two schemes had 48,000 participants), representing roughly 25% of small-holder cotton farmers⁷. In order to participate in the scheme farmers must meet three criteria: good repayment records for past years; acceptance by other members of the group; and achievement of certain

⁶ The ginners also employed a private company to place monitors in all ginneries as a double-check on volumes processed.

⁷ Such farmers can be characterised as generally farming small plots of communal or resettled lands, that are not irrigated and are principally in Natural Regions III and IV.

minimum yield levels. Participation peaked in 1995/96 with 85,500 farmers in the largest scheme, but it was subsequently reigned in and procedures tightened. To the extent that these are the more able farmers, who are less poor and less vulnerable, it focuses on a large minority of more advantaged small-holders. (This focus becomes still more pronounced for a small sub-set of participants - 6,000 “gold class” farmers who are allowed to borrow cash rather than inputs in-kind).

To put the programme in more perspective, it is useful to consider the loan portfolio of the Agricultural Finance Corporation in Zimbabwe. In its peak lending year (1986), it made 94,000 loans. Since then the number of loans has fallen consistently. 50,000 loans were made in 1990, and less than 4,000 by 1998. However, the AFC has had bad experience with repayment rates. High default rates coupled with constraints on public spending that meant that government guarantees were not forthcoming, has limited the current portfolio to a small number of recipients who are not in arrears on earlier loans.

In Uganda the cotton input scheme in 1998/99 sought to target an incredible 300-400,000 farmers. Admittedly, it is unlikely that this number was reached, but even if the programme was only 70% successful (a figure suggested by CDO’s managing director), the inputs still reach a very large number of farmers. There has not yet been any systematic analysis of the impact of the scheme and who benefits – but given that large numbers of farmers are involved it seems plausible that they include a cross-section of cotton farmers, including many “typical” resource-poor Ugandan small-holders.

Poverty focus appears stronger in Uganda⁸. In Zimbabwe the credit schemes almost certainly focus on the more able farmers, whereas in Uganda, any farmer growing cotton is (to some extent) self-selected risk-averse, resource-poor. (Cotton is clearly a marginal crop in Uganda, at current prices and yields, and farmers with other options, able to take additional risk, are less likely to grow cotton). Moreover, in Uganda cotton is grown in the drier more marginal areas. In Zimbabwe, land of comparable quality would represent some of the better land farmed by communal farmers; many communal farmers live in Natural Region V which cannot support cotton.

Efficient use of inputs

In an ideal situation cotton farmers would be able to make a rational decision on the use of inputs if:

- they face real and known prices for inputs and outputs
- they have reliable information on the relationship between input use and seed cotton yields (/quality)
- they are able to purchase inputs relatively easily, when they wish to, and
- they are able to sell their seed cotton relatively easily.

Small-holder farmers in Africa rarely operate under these conditions. Output prices usually depend on market conditions and are not known in time to influence production decisions (although guide prices may be announced for some crops).

⁸ It is important to consider this aspect, particularly where government or donor subsidy is involved – even if it is not an explicit objective of the commercial cotton companies.

Input prices may be more predictable, but rural retailers operating in thin markets served by poor infrastructure are often accused of profiteering, and indeed may face very variable costs themselves, such that input prices can vary substantially between traders, and over the same season. Farmers may have a reasonable understanding of the relationship between input use and yields, but there is always a degree of uncertainty reflecting the weather or other farmer or location-specific factors (such as unforeseen labour constraints arising from illness or heavy demands in another area)⁹. Moreover, specific inputs may not be available, with retailers offering a like product, with a different (and perhaps unknown) effect on output. In many parts of rural Africa it is not easy for farmers to make timely purchases of inputs: retailers may be located some distance away and a farmer may have to visit several outlets (at a cost in time and money) before s/he can make the desired purchase; s/he may not be able to afford to pay cash, requiring negotiation of credit through formal or informal channels; input needs may arise at short notice when they are not available; and so on. The last condition, that farmers are able to sell their seed cotton relatively easily, does seem to apply, at least in Zimbabwe and Uganda at the present time, where competing ginners are anxious to secure access to the crop. Farmers in remoter areas may not face so many choices, and may for instance face transport constraints, but at least these are generally known aspects, which the farmer can factor into her/his production decisions at the start of the growing season.

Clearly, then, these conditions for efficient use of inputs are unlikely to apply in totality. However, information from extension agents, information on prices, and improved infrastructure of the sort that helps reduce uncertainty and transaction costs, will help farmers *approach* these conditions. Even then though, given the residual uncertainty, farmers would be expected to discount expected returns, and hence apply inputs at less than theoretically optimal levels.

It is interesting to use this framework to consider the conditions faced by small-holder cotton farmers in Zimbabwe and Uganda.

Zimbabwean farmers seem to face better conditions on most counts:

- inputs are available in rural areas from the cotton companies, and also through the network of commercial retailers (which is thin but nonetheless gives better coverage than in Uganda);
- however, input prices are currently subject to some extreme price variability and uncertainty caused by depreciation of the Zimbabwean dollar, high inflation, and rumours of revaluation;
- cotton companies offer credit, or sell next season inputs when farmers are paid for their cotton, and make farmgate deliveries;
- input supply transaction costs are reduced by higher volumes and innovative schemes by cotton companies that link input and output marketing and transportation;

⁹ Pesticides usually represent a high proportion of cash costs in cotton production. However, there is an important “treadmill” effect here, which complicates the relationship between input use and yields. With on-going, and increasing use of pesticides, resistance sets in – reducing the yield effect and necessitating alternative measures.

- rural finance, whilst still a constraint in Zimbabwe, is nonetheless more accessible than in Uganda – and one of the cotton companies even lends cash (rather than inputs) to small-holders with a good track record of repayment;
- seed cotton prices are not known in advance with certainty – though guide prices are announced; (small-holders are no longer offered forward contracts by the cotton companies because of high rates of default when spot market prices at harvest time were higher); exchange rate changes create considerable uncertainty at the present time;
- cotton extension systems are reasonably well-developed in Zimbabwe, and many (most?) cotton farmers belong to groups linked to the extension efforts of the government extension service, NGOs, the Zimbabwe Farmers' Union, the cotton companies and input supply companies; these arrangements seem to reduce the potential for input companies to offer partial advice; moreover, farmers have more recent first hand experience of cotton production than they do in Uganda, where production is only just increasing again after a 15-20 year decline.

Given these circumstances, it is understandable that cotton farmers in Zimbabwe make considerably higher use of pesticides and fertiliser than their counterparts in Uganda, and achieve higher yields. Crop management is also better. They typically spray five times, compared with two in Uganda, and achieve yields of 750 kg/ha (seed cotton), compared with around 500kg/ha in Uganda¹⁰.

In rural Uganda, besides from the cotton input scheme, production inputs are not easily available to small-holders. Input retailers in rural areas are virtually non-existent¹¹. Farmers do not have access to reliable information about inputs, and have less recent experience of cotton production on which to draw. The extension service is stretched and currently being restructured. Input prices are neither known by farmers nor predictable, and there are no formal sources of credit for small-holders wishing to purchase agricultural production inputs¹². Farmers are able to sell their cotton relatively easily, but this situation has only recently improved – with an understandably lagged effect on farmer confidence and production.

The cotton input scheme being operated in Uganda clearly has its problems:

- difficulties assuring the timeliness of input delivery
- diversion of inputs by intermediaries responsible for their distribution, or attempts to charge farmers for the inputs at the point of delivery
- inputs given out to non-cotton farmers and cotton farmers going without
- farmers using the inputs on other crops, or selling them
- too few spray pumps with which to apply the chemicals
- farmers do not have the opportunity to make an informed decision based on the cost and benefits of pesticide application

¹⁰ To the authors' knowledge there has been no systematic study of farmer cotton yields in Uganda, and acreage is not known with any certainty. Whilst this figure is usually quoted in Uganda, consideration of gross output alongside planting seed distributed, would suggest that yields are even lower.

¹¹ A number of donor-supported initiatives are currently trying to rectify this with "stockist" supply and training programmes.

¹² One bank is operating a pilot programme to develop farmer lending methodologies, but its present coverage is extremely limited.

- getting ginners and government to agree to the scheme seemed to depend on assurances that costs to farmers and ginners would be contained; as a consequence, an unrealistic harvest forecast was used (which virtually assured a government subsidy in the form of the loan guarantee) and farmers were misinformed as to who would bear the cost of the inputs¹³
- more efficient producers effectively pay more their inputs (because they sell more cotton, and a uniform deduction per kg of seed cotton sold is made for the cost of the input scheme) whilst less efficient producers face lower cost inputs.

The scheme is inherently paternalistic in its approach – with the cost of inputs deducted uniformly from the entire harvest, despite inevitably unequal access. In addition, farmers cannot necessarily obtain the inputs when they need them, reducing their effectiveness and creating additional yield uncertainty. “Leakage” of inputs reduces the intended impact on the cotton crop, and the scheme’s critics argue that there is potential for rent-seeking behaviour at all levels. The scheme is institutionally complicated and costly (some of these costs are currently borne by CDO, with World Bank support).

A priori these ingredients would not seem to offer a promising outcome. Yet it is useful to compare the “with” and “without” input scheme situations – since the ideal conditions for rational decisions on the use of inputs clearly do not apply, nor are approached, in Uganda. Box 2 demonstrates how the input scheme does, despite all its imperfections, actually improve many of the conditions for input use and productivity – albeit as a stop-gap arrangement pending the development or emergence of more equitable, lower cost and sustainable systems. (The information in the box is based on the situation thought to prevail – notwithstanding the unacceptably high number of alleged incidents where the scheme does not operate in the manner intended).

¹³ CDO and UGEA state erroneously that the cost of inputs is met 50:50 by ginners and farmers, and the seed cotton guide price is adjusted downwards to reflect the 50% contribution by farmers. However, there is intense competition for seed cotton, since all the ginneries are operating well below capacity, and all are having to meet the costs of loans taken out for rehabilitation and modernisation. Farmers almost always receive more than the guide price and it appears that ginners pay as much as they can afford to secure their supplies of seed cotton.

Box 2: The effect of the input scheme on Ugandan farmers' ability to make rational decisions on input use

Ideal situation	Without input scheme	With input scheme	Effect of scheme	Comment
Farmer faces real prices for inputs and output	Yes	No	Negative	Under scheme farmer faces lower output price (= disincentive) and free inputs. The result is that efficient producers pay more for their inputs whilst inefficient producers pay less
Farmer knows the technical relationship between inputs and output	Poor information	Better (though not necessarily impartial) information	Positive	Without input scheme, thin input markets and poor information available on selection and correct use of inputs. Limited extension coverage
Farmer knows cost of input in advance	Probably does not	Yes	Positive	Without scheme, poor availability of inputs leads to uncertainty on input costs
Farmer knows cotton price in advance	Knows minimum price (rarely applies)	Knows minimum price (rarely applies)	Neutral	Competition for the farmers' crop results in ginners bidding above the guide price
Farmer can easily obtain and pay for inputs	No	Some farmers can obtain inputs more easily	Positive	Scheme not applied uniformly; some farmers cannot obtain inputs; inputs not necessarily available when needed
Farmer can easily market crop	Yes	Yes	Neutral	Ginneries under-utilised at current production levels

The only negative score in the box concerns price perceptions. Under the scheme, farmers face lower output prices and free inputs. The former shifts the demand curve downwards whilst the latter shifts the supply curve to the right. However, this does not necessarily lead to uneconomic levels of input use. Farmers do not have unlimited access to inputs, so cannot apply inputs to the theoretical optimal point (where the marginal value product would equal the cost of application i.e., until there is virtually no yield effect). However, there is a perverse effect on output. More efficient producers (from the ginning companies' perspective, these would be the farmers they most want to encourage) effectively pay more for their inputs (they sell more cotton, so face a larger deduction), whilst less efficient producers face lower cost inputs.

Figure 1 presents the information graphically. The levy on the output price lowers the demand curve (from D_1 to D_S). At current levels of production (or even if output doubled), the demand curve faced by farmers is fairly elastic – since all the ginners are operating well below capacity, and are assumed to be paying as much as possible to secure a larger share of the farmers' crop. Export marketing is not likely to pose a constraint at the present time. The “free” inputs shift the supply curve to the right. The objective of the scheme is to raise output over and above what it would have been in the absence of the scheme (Q_1). To merely match former output, the supply curve would have to move from S_1 to S_e . At this point, per unit costs of production have been reduced (because of free inputs) by the value of the “wedge” (difference in price received). If per unit costs of production fall by more than this, the ginners will achieve their objective of increasing output (*ceteris paribus*). The greater the effect on production costs, the greater the increase in output. There are no empirical data on this – but it is not implausible that Q_S (with the scheme) would exceed Q_1 . The input cost in 1998/99 was calculated at 64/- per kilogram of seed cotton, out of the guide seed cotton price of 330/-¹⁴. Production costs are assumed to approach sales price, at current yields¹⁵. Generally, cotton crops in the tropics are very susceptible to pest attack, so pesticides (or other control measures) are considered essential¹⁶. Moving from a long-established absence of pest control, and no pesticide resistance, the yield effect of two sprays (allowed for in the input scheme) could be expected to be relatively large.

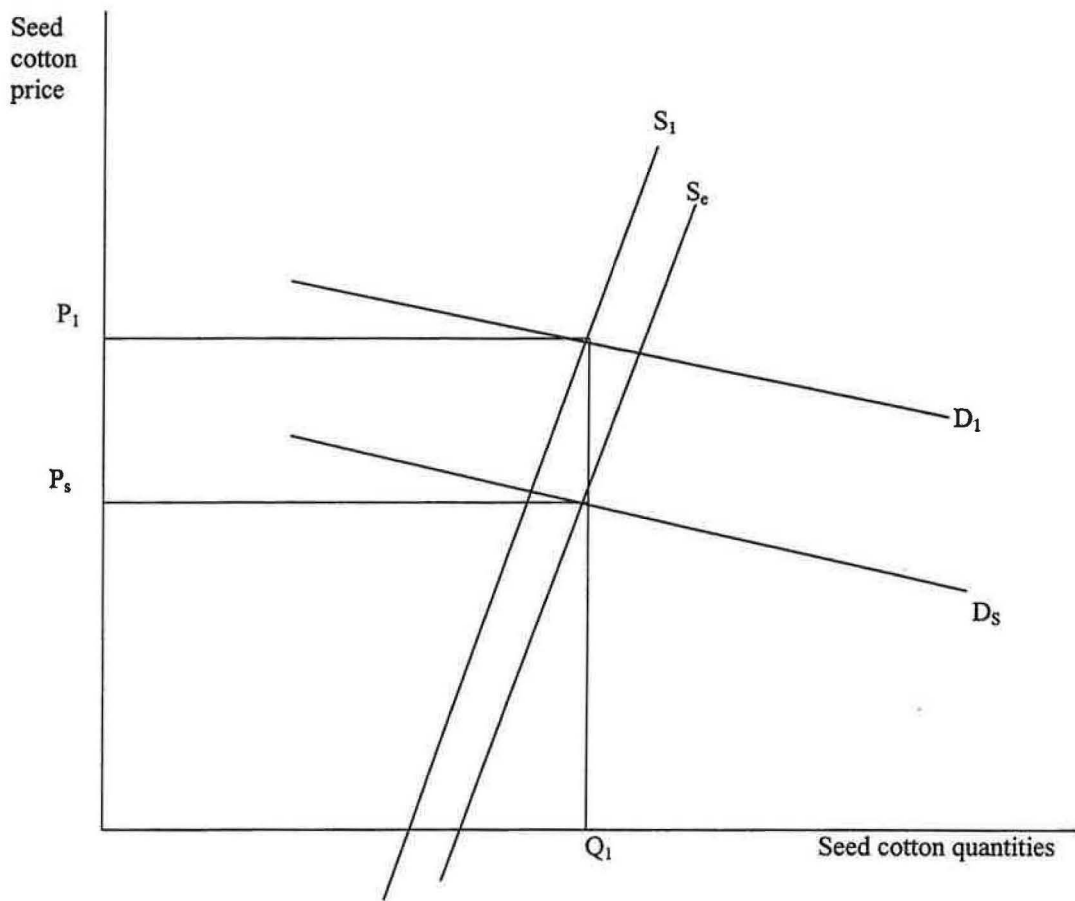
¹⁴ Referring back to the previous footnote, this price was then adjusted downwards when announced to farmers to take account of their 50% contribution to the input costs. In practice, many farmers were able to sell their crop at higher prices as ginners bid up the price to secure supplies.

¹⁵ It is clear from discussions with farmers and extension agents that cotton production is only marginally profitable at the present poor yields. Tentative estimates of cotton income suggest that a ½ acre plot may only provide gross income (essentially returns to labour and land) of around \$22. Moreover, cotton is regarded as labour-intensive because of land preparation and frequent weeding. However, it appears that farmers are nonetheless willing to grow some cotton as part of a risk-reducing multi-crop strategy because:

- they know they will be able to sell the crop for cash
- prices, although low, are relatively predictable and stable (and do not fall below the guide price announced by CDO at the beginning of the buying season)
- seed cotton sales coincide with Christmas and new school year expenditures, and
- following crops do well in fields previously planted with cotton.

¹⁶ It is not our purpose here to explore the merits of pesticides versus other control measures. However, it is worth recording that part of Lira District in Uganda is a certified area of organic cotton production. Pest control here is largely attributed to the presence of a beneficial black ant.

Figure 1: Supply and Demand for cotton with and without the input scheme



Clearly, the effect on output will be larger, the greater the difference between the fall in production costs and the costs of the input scheme. Some of the factors that affect this are listed below:

- operating the scheme so as to minimise costs whilst maintaining standards
- reducing sources of “leakage” such that “free” inputs reach farmers
- improving the effectiveness of the scheme by making sure that the inputs are available when needed and can be applied (ie there is adequate access to spray pumps)
- establishing mechanisms which reward rather than penalise the more efficient producers
- assuring high levels of repayment by ginners¹⁷
- making sure that middlemen buying seed cotton do not extract super-normal profits, and reduce the benefit seen by farmers.

Clearly there are several potential sources of inefficiency in the scheme, which would not be present in a system which permitted farmers to make their own expenditure and resource allocation decisions. Yet, as we have attempted to demonstrate in Box 2, it is unrealistic to compare the input scheme with an ideal situation that does not exist in Uganda at the present time.

Unfortunately, the 64/- cost does not reflect the real cost of running the scheme. CDO co-ordination costs are not included, and 64/- was based on an assumed harvest of 150,000 bales of cotton lint (in fact it turned out to be 80,000 bales). The UGEA were only obliged to repay 64/- per kilogram of seed cotton ginned (rather than the amount of the loan irrespective of the volume actually ginned). The loan, moreover, was obtained on concessional terms, with a government guarantee to cover the risk of non-repayment. (Given the rather unrealistic harvest forecast, this amounted to a subsidy). Viewed in these terms the viability of the input scheme appears highly questionable. Yet, the ginners plan to take out a further loan the following season – but this time at commercial rates without a government guarantee. (They are also negotiating commercial insurance cover against crop failure caused by natural events). Moreover, the ginners have a lot at stake and therefore are likely to demand high standards in the execution of the input scheme. Whilst there is an element (some observers would say a *large* element) of teething problems at the present time, these could be expected to be resolved fairly rapidly under commercial pressure.

Dependence on subsidies

The largest of the two schemes in Zimbabwe is partly dependent on funds provided at low interest under a World Bank support programme – though this now constitutes a small proportion of the loan portfolio. As a consequence input loans are charged at an interest rate of 25-26% (compared with commercial rates in excess of 40% and inflation of roughly 35% in late 1998). The smaller scheme cross-subsidises the programme from its other activities, and also makes use of an Agricultural Finance Corporation loan that is provided on concessional terms. Interest rates for farmers are roughly 29-30% per annum¹⁸.

¹⁷ If a default or shortfall factor has to be included, the cost of operating the scheme is likely to increase in subsequent years.

¹⁸ It is difficult to estimate a precise interest rate for both of these schemes. Both charge a flat rate, irrespective of the period of the loan, which varies.

At the present time, the degree of subsidy in the Ugandan scheme appears to be much more significant. It includes: uncosted inputs by CDO; a 50% subsidy in the form of a government guarantee (for 1998/99); and a loan that was obtained at less than commercial rates. For 1999/2000, the subsidy will be reduced; the ginners plan to obtain a commercial loan, and private insurance to cover a poor harvest caused by natural events (principally weather). CDO co-ordination will continue, and inputs left-over from the previous season (when the element of subsidy was higher) will also be used. In the medium-term, the CDO is supposed to fund all its activities from a 2% cess of the value of cotton exports. This is currently unrealistic (given levels of cotton output) and it is implausible that this situation could be attained by the time the World Bank project ends in December 2000.

Effect on seed cotton output

It is difficult to assess the impact empirically but there are persuasive arguments in favour of the schemes in both countries.

When the Zimbabwean scheme commenced in 1992/93 it was regarded as a way to encourage small-holder production, and maintain cotton output when large-scale commercial producers were shifting into other more lucrative crops. Small-holder production has not increased dramatically during the 90s (planted area has increased by about 10%) but levels have been maintained, and the small-holder share of total production has increased from 50% (1990/91) to 70% (1995/96). The fact that two of the three ginning companies consider the input programmes worthwhile is a strong indication that they are effective. Although only 25% of small-holders participate in the schemes, they are almost certainly more productive farmers, so their contribution to national cotton output (ie from communal farmers and large-scale commercial farmers) may exceed 20% (and could be more than 30%)¹⁹.

In Uganda, extension agents suggest that in the absence of the input scheme only 20% of farmers would buy chemicals. Yields are very low at the present time – and farmers are still cautious about cotton, with many having bitter memories of the former voucher systems where payments were late or not honoured. Moreover, cotton seems to be only marginally profitable – and a reticence to use purchased inputs is entirely understandable. In any case, inputs are not easily available, and most farmers could not afford them, even if they wished to use them. Output data (Table 1) do not reveal any immediately obvious impact. Although the harvest improved in 1998/99, this was following an exceptionally poor year (the effects of El Nino compounded by the late realisation that farmers who were expected to pay for seed for the first time would not plant cotton), and the crop in 1996/97 was larger (when seed was still distributed free). However, as in Zimbabwe, the ginners appear convinced that the programme serves a useful purpose – and have demonstrated their commitment to it by a preparedness to take out a commercial loan for the coming season (1999/2000).

¹⁹ All three companies recognise the need to improve access to purchased inputs, and all operate input purchase schemes, whereby farmers can pay for inputs for the next season's crop when they sell their seed cotton. It is argued that many farmers would rather do this, than take out a loan, and they benefit from current season input prices, which are subject to rapid inflation (though if the Zimbabwean dollar is revalued, early buyers will lose out).

Table 1: Seed cotton production in Uganda 1993/94 to 1999/2000

	Cotton lint bales (185kg) '000s	
1993/94	25	Prior to reforms
1994/95	35	Ginneries privatised
1995/96	56	Cautious supply response
1996/97	110	Growing confidence
1997/98	32	Poor harvest - El Nino
1998/99	82	1 st year of input scheme
1999/2000	150-190	Target (insured for 120 bales only)

Wider development impacts

The Zimbabwean schemes appear to offer considerably more potential as a springboard for other activities. The group approach builds farmer and community capacities in a number of ways. There is a strong focus on extension; farmers are able to make their own production decisions; and are exposed to financial discipline. They learn to act as a group, and to deal effectively with issues that arise within the group, where it is in their interests to do so. Strong performers are able to borrow cash – and one of the cotton companies intends to wean these farmers off the scheme, and “hand them over” to a commercial bank wishing to expand its rural network. The training invested in these groups is considerable (though shared by a number of parties) – but the benefits are essentially long-term and far-reaching²⁰.

The scheme in Uganda has no such benefits. Its inherently paternalistic nature does nothing to build capacity - with individual farmers or groups. It is essentially a pragmatic, short-run response to rapidly increase the cotton harvest to match the sudden increase in ginning capacity.

Sustainability

The schemes in Zimbabwe would appear to be more sustainable because:

- the element of subsidy is small
- the schemes are designed to build capacity and vest responsibility with the farmers themselves
- the farmers now enrolled are those who have demonstrated their ability to make repayments, and
- the process permits an evolution – such that farmers can graduate into bank lending schemes.

None of this is true in Uganda – yet sustainability may still be possible. It depends on:

- ability to contain costs of the scheme and to run it without subsidy
- ability to ensure that inputs reach farmers on-time

²⁰ The situation in Mali’s important cotton sector is not dissimilar. Groups take on important functions relating to assembly of the crop, input distribution, and payment to individual farmers. There has been a long-lived and on-going training input – but the benefits to the cotton company are seen in lower and transferred transaction costs, whilst the farmer sees greater cash income (because cotton company costs are reduced) and stronger capacity to be proactive as a group on other issues relating to rural services.

- ability to retain farmer confidence in the scheme (largely dependent on the above factors) and hence political commitment to it
- ability to reward more efficient producers.²¹

The encouraging point is that whilst the ginners are footing the bill, they can be expected to be critical task-masters, and intolerant of inefficiency and “leakage”. At the present time, the ginners are surprisingly committed to the scheme (surprisingly because the teething problems appear to have been considerable) – but over time, and as the element of subsidy is reduced, there should be inherent pressure from the ginners for a high quality operation.

Even if the Ugandan scheme proves sustainable, its impact will be limited to cotton, and within that, limited to narrow specific technologies. It does not replace the urgent need to strengthen other processes by which farmers can improve productivity, and gain improved access to information and farm inputs.

²¹ In Ghana, a similar scheme operated (though ginners did not compete on farm price amongst one another). It sought to address this problem of perverse incentives in two ways. First of all fertiliser was taken out of the “free input” scheme – and farmers charged directly for it; later, farmers achieving higher yields were paid more for their cotton (though farmers could manipulate this by presenting cotton produced by family or friends as their own cotton). Poulton, 1998.

Box 3: Summary of credit scheme performance

Performance criteria	Countries	
	Zimbabwe	Uganda
<i>Repayment</i>	High: 98%+	Effectively only 50% in 1 st year
<i>Farmer participation</i>	53,000 small-holders probably more able farmers	300,000 including many self-selecting resource-poor, risk averse farmers
<i>Efficient use of inputs</i>	No data available but inputs likely to be used efficiently because of: <ul style="list-style-type: none"> • monitoring and extension • farmers pay for inputs • inputs not significantly subsidised 	Evidence of significant “leakage” and inputs not necessarily available when needed in a form that farmers can use (ie too few spray pumps). Perverse incentives which encourage less efficient producers and discourage the more efficient.
<i>Dependence on subsidies</i>	Minor subsidy element only?	Major subsidy in 1 st year to be reduced in years 2 and 3. Scheme presently relatively high cost – and may collapse in the absence of subsidy
<i>Effect on seed cotton output</i>	Positive – particularly as focus seems to be on more productive farmers	Effect not clear – ginners nonetheless confident that scheme is necessary
<i>Wider development impacts</i>	Capacity-building with farmers and groups, empowerment	Wider impacts are limited – inherently paternalistic scheme, with benefits related directly to any increased income accruing to farmers
<i>Sustainability</i>	Appears sustainable: <ul style="list-style-type: none"> • subsidy is small • capacity-building • demonstrated ability to repay • process permits further development 	Questionable – unless costs can be significantly reduced, inputs more focused on intended beneficiaries, and dependence on subsidy reduced

4. Input credit for small-holders: wider lessons and discussion

In post-liberalisation Africa, there has been considerable reflection on private sector reticence to provide services previously provided by the state. One of the areas that has suffered is small-holder access to inputs and credit. However, our research in Uganda and Zimbabwe illustrates that there are some very considerable successes – with very high farmer participation – that are significantly funded by the private sector (and are unarguably a private sector initiative). Although both of these case studies focus on cotton, a number of more generic lessons can be drawn. We consider these under three headings below:

- incentives for private traders/processors to offer farmers production credit
- why farmers would participate in such schemes
- factors which influence credit scheme viability.

Incentives for private traders/processors to offer farmers production credit

The main reason for offering credit is to address some kind of supply constraint:

- assuring supplies of appropriate quality, volume, regularity and price
- reducing costs of acquiring raw material
- keeping markets or plant supplied at levels which assure viability, future market access or desired market share
- protecting long run raw material supply.

Small-holder credit programmes are risky and administratively onerous, and in the absence of any need to improve the supply of raw material (in various ways), traders or processors are unlikely to offer farmers production credit.

Factors which influence farmer interest in participation in a credit scheme

Farmer interest in credit scheme participation will be influenced by:

- perception of benefits derived from use of inputs and market access
- scheme offers better/cheaper/easier access to inputs and/or credit
- farmer operates in context where s/he is able to plan ahead and willing/able to take some risk

Unfortunately, where there is a recent history of loan amnesties and default without penalty, farmers may not associate participation in the scheme with an obligation to make repayments.

(The *accessibility* of the scheme will also influence farmer participation, but this is discussed below).

Factors which influence credit scheme viability

Box 4 provides a summary of the factors which influence the viability of input credit schemes (assuming that such schemes are operated by traders or processors interested in securing access to a particular crop).

Box 4: Factors which influence viability of crop input credit schemes		
Factors/aspect	Effect	
<i>Crop market characteristics</i>		
1. Crop purchase monopoly and no food/farm use of crop	+	*
2. Possible for all buyers/users to form association and no food/farm use	+	*
3. Multiple marketing channels and/or food use	-	
<i>Input qualities</i>		
1. Inputs provided in-kind	+	
2. Limited alternative use or market for input	+	*
3. Returns to input use are greatest for the crop in question	+	*
<i>Commercial/credit context</i>		
1. Farmers treat farm as a business and are integrated into markets	+	
2. History of loan amnesties, default without penalty, subsidised inputs	-	
3. Supportive legal/political/contract enforcement institutions	+	*
<i>Modus operandi of scheme</i>		
1. Group schemes for peer pressure	+	
2. Group or individual schemes backed up by monitoring/good information, support staff, and ability to act	+	
3. Incentives for repayment and penalties for non-repayment	+	
4. Appropriate incentives for field monitors/co-ordinators	+	
5. Training provided to farmers – extension and business management	+	
6. Developing relationship/trust/loyalty through field presence/contact	+	
7. Accessibility of scheme – minimise red tape and transaction costs; organise so location and timing of contact is convenient to farmers	+	
8. Effective and timely monitoring of input use and crop marketing	+	
<i>Note: * denotes killer assumption</i>		

The significance of these categories, and particular aspects, is that they need not all be present for a scheme to work, but most schemes will need to incorporate several aspects to ensure a degree of success. For instance, the Ugandan cotton example relied on the buyers forming an association (crop market characteristic 2), but for the scheme to succeed it was also necessary for inputs to be provided in-kind, and to incorporate several measures from the *modus operandi* group (eg., monitoring, extension and accessibility). The scheme can then function, even if the overall commercial context is weak.

The Zimbabwean cotton credit example indicates that even when few favourable crop market and input conditions are present (fertiliser and cash (!) are available on credit in Zimbabwe), it is nonetheless possible to develop strong and viable input schemes. The success of the schemes in Zimbabwe is very dependent on the presence of favourable conditions relating to overall commercial context, and *modus operandi*.

So-called “killer assumptions” are also identified in Box 4, ie. conditions which would be favourable (for the operation of a credit scheme) if in place – but rarely are so. They include: crop purchase monopolies, which are increasingly rare; situations where all buyers can form an association effectively creating a crop purchase monopoly; inputs that have no other use or cannot be put to any other comparably profitable use; and supportive institutions for contract enforcement (the importance of which is particularly stressed by Dorward *et al.*, 1998). The latter is included because although many countries may have appropriate legislation or policy, there are often compelling political economy, implementation and access factors that prevent its effective operation at local-level, or for particular groups. Also, the buyers’ association approach may be difficult to apply in practice, because of unwillingness to take joint action. The fact that these favourable conditions rarely apply means that a viable scheme is necessarily dependent on several measures which could be described as best practice in lending to small-scale farmers.

Best practice in rural credit, in company input schemes and other loan programmes

Box 4 lists a number of carrot and stick measures (under *modus operandi*) – which do not depend on unrealistic assumptions about, for instance, the ability to enforce contracts using legal mechanisms (which even if possible, would probably be very transaction costs-intensive). Their focus on groups, training, monitoring and incentive systems makes them initially costly – but once in place, farmers can take on a greater share of these costs (groups can act as crop assembly points, and distribution points for inputs – reducing the transaction costs inherent in reaching many small farmers). Moreover, these measures build group/individual capacity so that farmers are able to combine their knowledge of, for instance, land characteristics and agronomy, with information about inputs, and use this to make informed decisions about input use. Without this capacity building, technology packages tend to be inflexible (and therefore not ideal in all situations) or very costly in terms of extension (as seen, for instance, with some of the intensively-managed small-holder outgrower export horticulture schemes in Africa). Nonetheless, the implicit start-up costs, and the fact that the benefits are long-term (and also, far wider than just the crop in question) mean that they are only likely to be attractive to companies able to take a longer view.

Such best practice mechanisms in rural lending are robust to different situations. For instance, they are similar to the measures used by Grameen Bank type schemes – where inputs are not necessarily provided in-kind or targeted to a particular crop. This approach, moreover, yields benefits even where the marketing structure does not demand such an approach. (The cotton company in Mali, for instance, which has a crop purchase monopoly, nonetheless uses virtually all of these measures to reduce transaction costs and increase cotton output). There seems to be a clear lesson here for Uganda too: whilst it is difficult to envisage a viable alternative to the existing scheme given current conditions and circumstances (and this is true, despite all the

problems in the operation of the input scheme), it does not obviate the necessity and desirability of investment in longer term measures aimed at more sustainable and substantive improvements in small-holder productivity. At the same time, it may be more difficult still to get commitment to such long-term goals amongst a large group of companies (approximately 30), including many that have only participated reluctantly in the present input scheme.

When can the buyers' association approach work?

The possibility of creating a buyers' association seems to greatly expand the potential for viable commercially-provided small-holder credit. Yet, on closer examination, there are probably relatively few situations where this is likely to happen. In Uganda, it was administratively costly and time-consuming to organise such an association (the CDO played a key role in this, with the support of a small number of larger ginners, but the smaller ginners were apparently reluctant partners). The larger ginners have most to lose and most to gain from an increase in cotton output. They were able to exert pressure on the smaller ginners via the CDO (membership of the Uganda Ginners and Exporters Association is compulsory) and also because the larger ginner exporters export some of the cotton ginned by the smaller companies. Moreover, all the ginners face similar problems and constraints – and no single company is privileged in the resources it has to tackle these issues. So although there are a few larger companies (which are substantially better-resourced/cushioned than the smaller ginners), these larger companies are on a fairly equal footing with one another. By contrast in Zimbabwe, a buyers' association (of just three cotton companies) would be relatively easy to organise – but there is less interest in collaboration of this type. The largest company (the former parastatal whose operations dwarf those of the other companies) undoubtedly has privileged access to information about individual farmers, farm output and repayment history. It appears to have judged its competitive advantage best-served by protecting this exclusive access to information (and devising alternative measures to combat the problems encountered in the wake of crop marketing liberalisation). Another factor which limits the potential to replicate the buyers' association approach is that it will only solve the problem of "side-marketing" (farmers taking credit from one company and selling output to another) if the crop in question has no value on-farm or in local markets. This limits potential considerably – mostly to crops which need to be industrially processed (such as fibres and some oilseeds) or which are exclusively produced for export (such as tobacco, in some places).

So, in summary, the potential to use the buyers' association approach to credit seems to depend on:

- existence of mechanisms to exert pressure on laggards/reluctant partners
- a fairly level playing field between buyers (ie comparability in what they stand to gain/lose), and
- crop use options limited to those buyers (no food use or local marketing).

Lessons for governments wishing to promote private provision of smallholder credit

The Ugandan example does provide an alternative model with application in situations where financial discipline and contract enforcement mechanisms are weak. The Ugandan Government, via CDO, played a critical role in focusing ginners' attention on the scope to collaborate, and in facilitating the formation of an association, and its initial access to funds. It has also contributed concretely through the co-ordination on the input distribution process. The niche for an agent such as CDO was probably there partly because, following liberalisation, most of the ginners were relatively new and inexperienced in the workings of the Ugandan cotton sector. In the medium-term, there should be no need for an input by CDO, or if still involved in input distribution, these services should be provided on strictly commercial grounds. However, during the initial re-establishment of cotton in Uganda, their role has been important, and may have application in other sectors and countries.

Looking beyond these early stages in the rehabilitation of the Ugandan cotton sector, it will be important to shift to more efficient and sustainable means of increasing smallholder productivity. Governments can promote public/private/NGO/farmer partnerships that improve farmer access to purchased inputs – much as they work in Zimbabwe. Building farmer group capacity, as a vehicle for extension, input distribution, crop assembly, and participation in wider consultative processes, is a particularly important part of this process.

Governments should also seek to fill research and information gaps on the use of purchased inputs, including combination packages which exploit synergies between farmer-supplied and external inputs.

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Annex 3: text of NRI Policy Series Publication (in press)

**IMPROVING SMALL-HOLDER ACCESS TO PURCHASED INPUTS IN
SUB-SAHARAN AFRICA**

**by Ann Gordon
Natural Resources Institute
1999**

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Executive summary

This paper is about policies and interventions to promote increased access to purchased inputs by smallholders in sub-Saharan Africa. It is one of a series of papers, targeted to a wide audience in the development community, intended to contribute to increased focus on poverty by informing and stimulating debate, policy and action amongst key players in the development process.

Increased use of inputs in African agriculture is an important policy issue because: most of Africa's population lives in rural areas, and is dependent on agriculture for at least part of its income; in the past, increases in productivity were achieved through expansion of planted area, but as population pressure increases there is less scope to do this; few African countries have been able to keep pace with the food needs of growing populations, and food imports are rising steeply; much of Africa's agricultural production is located in vulnerable low potential areas, and even higher potential lands are now showing signs of environmental degradation; and reform of agricultural markets has left many farmers with poorer access to purchased inputs.

Five sets of issues affecting access to inputs are explored: affordability; availability; information; risk and uncertainty; and the overall commercial context. Case studies are used to illustrate how these issues can be addressed.

Credit is often assumed to hold the key to improved access. Different approaches to input credit are reviewed, and best practice measures are outlined. Other ways to improve affordability are also identified: timing input sales to coincide with times when farmers have cash; selling inputs in small pack sizes suited to small producers (eg seed); and lowering prices, by making cost reductions in distribution and marketing (eg through bulk purchases, transport sharing arrangements, and farmers' groups taking on more responsibilities).

Many consider the physical availability of inputs to be a more important constraint to access, with thin and unreliable rural distribution networks in most African countries. Innovative approaches to the development of input stockist networks are reviewed, illustrating what can be achieved through constructive partnerships between the commercial, private non-profit, farming community and government sectors.

Information constraints are also important – be they in terms of information gaps (basic research on fertiliser response for instance) or information flows. Although farming is, to some extent, inherently risky, better information reduces uncertainty, enabling farmers to make informed production decisions.

In addition to policies aimed the general development of rural economies, a number of more specific policy recommendations are made: avoid actions which undermine the development of sustainable commercial input supply networks; support input markets by setting standards and regulations, and providing information and training; promote synergistic partnerships between commercial, private non-profit, farming community and government sectors; and fill critical research and information gaps.

List of abbreviations

ADC	Agribusiness Development Centre (Uganda)
ATAIN	Agent Training and Input Network
CBO	community-based organisation
CDO	Cotton Development Organisation (Uganda)
DFID	Department for International Development (UK)
FAO	Food and Agriculture Organisation of the United Nations
GDP	gross domestic product
IARC	international agricultural research centre
IFDC	International Fertiliser Development Center
IFPRI	International Food Policy Research Centre
MALD/DAO	Ministry of Agriculture and Livestock Development/District Agricultural Office (Kenya)
NARS	national agricultural research system
NGO	non-governmental organisation
NRI	Natural Resources Institute
SSA	sub-Saharan Africa
UGEA	Uganda Ginners and Exporters Association
USAID	United States Agency for International Development
USP	Uganda Seed Project

INTRODUCTION

This paper is about policies and interventions to promote increased access to purchased inputs by smallholders in sub-Saharan Africa.

This is one of a series of papers which seeks to elaborate the relationship between poverty, rural livelihoods and key policy areas. The papers are targeted to a wide audience in developing country governments, donor agencies, research institutes and other organisations concerned with development or governance. They are intended to contribute to increased focus on poverty by informing and stimulating debate, policy and action amongst key players in the development process.

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Improving access to purchased agricultural inputs: why it's important

Small-holder agriculture in much of sub-Saharan Africa is essentially low-input low-output. Since 1970, cereal yields in Africa have stagnated, whilst they have trebled in Asia, and risen by 2.5 times in Latin America. Green revolution technology has not been widely adopted. For instance, for all developing countries, the shares of cropped area devoted to modern varieties are 57% (maize), 70% (wheat), and 74% (rice). Of these three, maize is the crop most relevant to Africa – and only 43% of maize area in sub-Saharan Africa is devoted to modern varieties of maize. (Fritschel *et al.*, 1996). Moreover, crops that are important in African food systems are less important in other regions, and have been the subject of less research (for instance, sorghum and millet, roots and tubers, and cooking bananas). Fertiliser use is also extremely low at 9-11 kgs/hectare (Badiane and Delgado, 1995). Indian rainfed agriculture has three times the fertiliser applied to African crops (African Development Bank, 1996). Such aggregate data, moreover, conceal extreme variability in application: five countries account for roughly 2/3 of fertiliser consumption in sub-Saharan Africa (*ibid*).

Increased use of inputs in African agriculture is an important policy issue because:

- most of Africa's population lives in rural areas, and is dependent on agriculture for at least part of its income
- in the past, increases in productivity were achieved through expansion of planted area, but as population pressure increases there is markedly less scope to do this
- few African countries have been able to keep pace with the food needs of growing populations, and food imports are rising steeply
- much of Africa's agricultural production is located in vulnerable low potential areas, and even higher potential lands are now showing signs of environmental degradation
- changes in agricultural markets following structural adjustment have left many farmers with poorer access to purchased inputs.

The pivotal role of agriculture

Sub-Saharan Africa, more than any other region in the world, is overwhelmingly dependent on the agricultural sector. It accounts for a large proportion of GDP and exports in most countries (countries with significant mineral deposits are the only exception to this); it provides both direct employment and secondary employment in handling and processing industries; it is central to the livelihoods of the poor who are predominantly rural; and its development is closely linked with environmental issues of soil fertility, deforestation and water use. Anyone concerned with poverty in Africa is necessarily concerned with agriculture – because of its role in the incomes and consumption of the poor.

Expansion of cultivated area

Historically, increases in agricultural output in Africa were largely attributable to the expansion of cultivated area - through destruction of forest and cultivation of increasingly marginal areas. However, the scope to convert new lands has declined. For instance, the rate at which new arable land was developed in Africa (including North Africa) was about one third less in the 70s than it had been in the 60s - and in some regions the decline was much starker. In southern Africa, for instance, arable land development fell from about 2% per annum to around 0.5%. Reserves of good quality land were running out, and farmers had little incentive to expand given poor producer prices, labour shortages and the decline in rainfall since the mid-50s. It is now widely accepted that further production increases can only come (with a few exceptions) from more intensive production (see for example, Badiane and Delgado, 1995, Marter and Gordon, 1996, Lipton, 1988).

Keeping pace with food needs

Analyses of trends in population growth, food production and incomes consistently emphasise growing food deficits in Africa, under most reasonable assumptions (see, for example, Agcaoili and Rosegrant, 1994, and Fritschel *et al.*, 1996).

Population growth in Africa overtook Latin America and the Caribbean in the 1970s. In many African countries the 1990 population was more than three times the 1950 figure. The raw data indicate that in SSA the countries with the highest population growth were Kenya, Uganda, Zimbabwe and Cote d'Ivoire - where 1990 populations were at least 3.6 times those in 1950 (United Nations, 1995)¹. Moreover, Africa is *urbanising* at an alarming rate. Roughly one third of the population is now urban. Table 1 illustrates considerable inter-country variability in urbanisation but an unmistakable upward trend. (Total populations are included to add perspective).

	Urban share 1950	Urban share 1990	Total population 1990
Nigeria	10%	35%	96 million
Ethiopia	5%	12%	47 million
Dem Rep of Congo	19%	28%	37 million
Kenya	6%	24%	24 million
South Africa	43%	49%	37 million
Tanzania	4%	21%	26 million

¹ Caution is needed in interpreting much of the population data for Africa. For many countries, current figures are estimates or projections based on census data from the early 1980s.

One of the implications of these trends is that if African countries are to sustain or improve on current levels of food self-sufficiency, agriculture labour productivity must continue to increase. This has happened - but not as fast as population growth, and not enough to feed the growing share of non-food producing consumers. For the population as a whole, per capita cereal production has actually fallen by about 15% in Africa (1992-94 production compared with 1970-72, Fritschel *et al.*, 1996). The data on other staples (notably roots and tubers) are notoriously unreliable - but it is implausible that growth in their output has been significantly faster. Banana yields have been falling in Uganda (the country where it is most important as a staple). New cassava varieties have been introduced – but the crop has also been affected by some major pests and diseases such as cassava mosaic disease.

Low potential areas

Much of Africa's agricultural production and rural poor are located in low potential areas (80% of cultivated area is low potential, according to Delgado, 1997). This label conceals considerable differences in the nature of low potential land but it does underline the challenges implicit in increasing agricultural productivity in Africa. The term encompasses consideration of economic, physical and technological factors – reflecting, for instance, market access, the inherent productivity of the natural resource base, and use of appropriate environment saving technologies. Land potential can change over time. Both high potential and low potential lands may deteriorate through unsustainable practices, whilst infrastructure development, changes in production technology, and policy changes which favour domestic crops over imports, may improve potential. The key issues of concern here are:

- production on low potential lands can only be sustained or increased with increased use of inputs
- whilst some of those inputs may come from within the farming system, there is an important place for some purchased inputs (particularly improved varieties and some use of inorganic fertiliser)
- economic factors which contribute to low potential (poor market access and low purchasing power of farmers) also limit small-holder ability to purchase the required inputs, whilst low and uncertain rainfall increases the risk associated with higher input systems.

Structural adjustment

Although somewhat mixed and patchy, there is growing evidence that structural adjustment has reduced small-holder use of purchased inputs. This can be attributed to various aspects of economic reform:

- depreciation has led to increases in the domestic value of externally traded goods, and a relative decline in the value of non-tradeables; as a consequence the use of imported fertiliser on food crops is now less economic or even uneconomic;
- governments have closed loss-making credit programmes and subsidised input schemes;
- remote areas, once served by the parastatals, have tended to be neglected by private marketing agents, who have now taken over crop and agricultural input trade;

- crop prices are less predictable such that risk-averse farmers are less likely to use purchased inputs
- the abolition of crop purchase monopolies has made it difficult to establish viable farmer credit schemes, which in the past relied on repayment being made when the harvest was sold, and
- public sector spending restraint has reduced the resources available to extension services.

Intensification: purchased inputs and farmer-supplied inputs

The focus of this paper is *purchased* inputs. This focus is not intended to imply any exclusivity in this strategy to increase productivity – rather that purchased inputs, even in small quantities, can usefully complement other means of intensification. Moreover, many of the issues affecting access to purchased inputs are somewhat different to those that apply to farmer-supplied inputs. In addition, the conditioning environment in African agriculture, in which farmers take and act upon production decisions, has been subject to considerable recent change – making re-analysis of these issues an urgent priority.

What this paper covers

Following this introductory section, there are three sections:

- a review of the issues affecting small-holder use of purchased inputs
- strategies to improve small-holder access, and
- conclusions

In addition to the extensive literature on this topic and related issues, the paper draws heavily on field work and workshops conducted by NRI in Uganda and Zimbabwe in 1998 and 1999. The purpose of this research was to identify viable private credit schemes that facilitate small-holder access to production inputs. Whilst the work confirmed the importance of credit, it pointed to a number of other constraints presently affecting the use of purchased inputs. It is this breadth of issues which is explored in this paper.

ISSUES AFFECTING SMALL-HOLDER USE OF PURCHASED INPUTS

Five sets of issues are explored:

- affordability
- availability
- information
- uncertainty
- commercial context.

There is no prioritisation implicit in the order of the topics. Rather, they are all important and linked by many inter-related issues.

Whilst some of these topics may seem obvious, they have been broken down into their various components – lest certain aspects of a particular constraint should be overlooked. In the following section, where strategies to increase the use of purchased inputs are explored, the importance of these components becomes clearer. Thus, for example, affordability can be improved by a change in the timing of sales.

Affordability

Many African small-holders cannot afford to buy agricultural inputs. Although this is a straightforward enough concept, it does encompass different dimensions.

Price

At its simplest, farmers cannot afford inputs because they are too expensive. Many agricultural inputs have been subject to dramatic price increases – as a result of the removal of subsidies, price controls and currency depreciation. Gibbon (1992) reports that under structural adjustment in Ghana, fertiliser and pesticide price rises exceeded inflation by a factor of five or six. In some cases, the price structure and yield response is such that the use of certain inputs may no longer be justified on crops produced for the domestic market – but whether or not this is the case, most African small-holders have very limited purchasing power, and agricultural inputs represent a major outlay.

Whilst there is no doubt some profiteering by traders, there are many other factors which contribute to inherently high costs in delivering inputs to farming areas, under the market and infrastructure conditions prevailing at the present time. These factors include:

- low volume imports – so less discount for bulk purchases and higher per unit transport costs (the latter is particularly true of land-locked countries)
- dispersed local markets making low volume purchases, in a tightly concentrated seasonal window – which all contribute to high costs per unit of input
- poor roads and telecommunications, and transport bottlenecks (including the operation of transport cartels) increase transaction costs, and

- payment of bribes in order to obtain timely import clearance on seasonal inputs.

Transaction costs

Closely related to price, are the cash costs involved in input purchase other than the price of the input itself (there are other costs too, including the time needed to find about and source inputs). Purchase may require the farmer to travel to a local (or distant) town, necessitating expenditure on transport and accommodation; it may require phonecalls (where these are possible); or even signing up for a larger package which includes unwanted inputs (some farmers in Uganda apparently sign up for seed and fertiliser packages available through development projects, simply to obtain the seed, which is in short supply).

Unit size

Some inputs would be more affordable if they were available in smaller pack sizes (notwithstanding the additional packaging costs). African farmers tend to plant small areas; they plant many crops, and they intercrop. When they try out new seed they often only want small quantities initially – and may still demand modest quantities of seed which is known to them. Obvious though this may be, inputs such as seed are often not available in sufficiently small pack sizes. Even purpose-built seed handling systems may not have appropriate pack size capacity. (For example, the Uganda Seed Project, a parastatal concerned with small-holder seed provision, has the capacity for 25kg and 10kg seed packs. In an attempt to respond to farmer needs, they fill 5kg and 2kg packs manually, but recognise that pack sizes of 1kg and 500g would be better still). Whilst retail outlets, projects or farmers may split packs, this always calls into question seed quality guarantees.

Credit

Although credit may theoretically provide a solution to low purchasing power, Africa's small-holders are notoriously ill-served by formal credit mechanisms. Banks regard farmers as high risk and high cost (because of the small size of individual transactions) and tend to have very poor rural networks. Former loss-making state-supported schemes have been closed, along with the schemes run by parastatals that had crop purchase monopolies. Although some NGOs and other organisations are trying to develop sustainable farmer lending methodologies, there are few good examples, and farmer participation in such schemes is the exception rather than the rule. Informal sources of credit are no doubt important – particularly from friends and family – but inadequate, since expenditure patterns follow a similar seasonal pattern in rural areas, with everyone's need arising at the same time.

Timing of income and expenditure

Cash flow is important – and the timing of expenditure may be a crucial determinant of affordability. In poor households there is intense demand for scarce cash resources, and a prior crisis may eat into resources otherwise ear-marked for important agricultural inputs. In Zimbabwe the cotton companies sell next season inputs when they purchase seed cotton, knowing that farmers have the resources to make purchases at that time. Similarly, in Uganda, farmers grow cotton despite its questionable profitability, and it seems that the timing of crop sales, which coincide with Christmas and new school year expenditures, is an important consideration.

Household decisions on expenditure

The decision to purchase inputs for a particular crop may be influenced by access to cash within the household and traditional domains of decision-making. Whilst men are often involved in the production and marketing decisions concerning traditional cash crops, women tend to play a greater role in the production and marketing of food crops. They may find that their husbands do not attach a priority to input needs on these crops whilst their own resources may be too stretched to extend to input purchase.

Availability

Even when households can afford inputs, they may be unavailable. Again, there are several aspects to this.

Small domestic markets and low volume imports

Despite large numbers of farmers, many African countries represent very small markets for agricultural inputs – largely because of low purchasing power. Thus many inputs may not be available in the country simply because the volumes that can be sold are very small. This is less of an issue in, for example, Kenya, where small-holders and estates make high use of inputs, than, say, Uganda, where the estate sector is small and small-holders generally have very low purchasing power. (Kenya's imports of fertiliser were 150,000 tonnes in 1998, compared with only 10,000 tonnes in Uganda. Magnay, 1999).

Availability of specific formulae

Consideration of aggregate availability may conceal some important distinctions. Fertiliser may not be available in the appropriate formulae, for instance, or important complementary inputs may not be available, thereby reducing the effectiveness of the overall package. (In Uganda, although chemicals were distributed to cotton farmers, too few had access to the spray pumps needed to apply them).

Timeliness

Farming is a highly seasonal activity – and inputs are needed at very specific times. Some peak needs can be anticipated (seed at planting time for instance – even if planting dates shift depending on rainfall), whilst others arise at short notice (the sudden emergence of a pest requiring rapid action to save the crop). Where inputs need to be imported at short notice, it is unlikely that the market can respond in time – and even where it is a question of distributing inputs from the capital to rural areas, information and transport constraints may prevent a sufficiently timely response.

Distribution networks

For the farmer, the non-availability of inputs often manifests itself in the first instance in the absence of local agricultural input retailers. Farmers must generally travel some distance to locate inputs (sometimes to the capital) with no guarantee of success or affordability. Moreover, where input needs arise at short notice during the planting season, there is an especially high premium on the farmer's time, making the uncertainty and absence of local outlets all the more problematic.

Information

Information constraints arise at different levels.

Yield response to inputs under farmer conditions

The information constraint is first of all apparent in the straightforward lack of reliable information on yield response to, for instance, fertiliser, under the conditions and soils prevailing in farmers' fields. Stakeholders participating in the NRI workshops stressed this lack of information in small-holder systems as different as those in Zimbabwe and Uganda. Under certain conditions, and for some inputs, the research has been done – but it is not easily accessible. Nor would it seem that these are areas on which an informed consensus view can be easily reached, given the widely differing views expressed at the workshops.

Extension services

Even assuming that the information exists, it may not easily reach farmers. Extension services in many countries have been hit hard by public sector budgetary constraints – leaving many workers with their salaries paid but no funds to visit farmers. In many cases they are doing the best they can in difficult circumstances, but certain problems are widespread:

- bias towards less poor farmers, men and accessible farmers
- lack of printed extension material available in local languages
- messages not suited to conditions which prevail in farmers' fields, and
- inflexibility in adapting messages to farmer needs.

Other sources of information

As a consequence farmers rely heavily on information available from other sources:

- friends and family
- farmers with privileged access to information - those involved in trials, demonstration plots, seed multiplication or contract farming, for instance
- NGOs and development projects
- farmers' groups and associations
- radio and newspaper
- traders and purchasers of farmer crops
- farm input retail outlets (where they exist)
- information provided with the product.

The first four are likely to have very piecemeal information – expanding the farmer's knowledge, but with no certainty that s/he has sufficient information on which to make a well-informed choice between technologies or inputs.

Mass media may, in some countries, provide targeted farmer information services – but in many countries provision for farming communities is very weak.

Traders can be a good source of information on preferred varieties – and may actually get to see enough farmers to gain an understanding of problem remedies that work.

Companies buying particular products – or running contract farmer schemes – are more likely to have knowledgeable field agents.

In an ideal world, retail outlets would offer comprehensive impartial advice on the farm inputs available. Too often, however, the temptation to tout particular products is too high – and in many areas there is no alternative supplier to which the farmer can turn for a second opinion. (Recent work by NRI in India suggests, plausibly enough, that where retailers are farmers themselves, and located within the farming community, they are more likely to offer impartial advice). Where products are retailed in their original packaging, information provided with the product is likely to comply with international information standards (giving the active ingredients, intended use, recommended rates and methods of application, and shelf-life) but again may be in an inaccessible form (written in small dense print, in a non-native language, using technical terms). Its inaccessibility may extend to the retailer as well as the farmer.

Price information

An informed decision on the use of purchased inputs also requires information on prices, and in thin markets, prices can be particularly uncertain and variable. Likewise the transaction costs incurred in locating the input. Again, stakeholders at the NRI workshops in Zimbabwe and Uganda considered this an important issue affecting small-holder access to purchased inputs.

Safe use of chemicals

Farmers need information on the safe use of chemicals – and the means of compliance with such recommendations. Whilst development projects stress these aspects, and international companies “cover” themselves with the information they supply with their products, the reality is that farmers are often unaware of particular risks – or may be unable to apply the input in the recommended manner (making use of protective clothing for instance).

Quality criteria

Another issue which arose at the NRI workshops concerned the standards set/regulated by the public sector, and farmer (/retailer) needs for information on how to assess input quality where such standards do not exist or are unreliable. This applied particularly to seed viability – and arose in the context of government plans to privatise seed production and sales units.

Risk and uncertainty

Farmer willingness to purchase inputs is also affected by risk and uncertainty.

Weather risk

Low and uncertain rainfall is closely linked to low use of purchased inputs, since it creates additional yield risk. Most African agriculture is rainfed. Only 8% of cereal production is irrigated, compared with 20-40% in other developing regions.

Market risk

Where output prices are very volatile, farmers may be unwilling to apply inputs for fear that they may not cover costs. Maize prices in Uganda are a case in point. They

are subject to major swings on account of large, lumpy, unpredictable relief purchases for neighbouring countries. Some years, maize is a highly profitable crop for farmers, whilst in other years, other crops offer much better returns.

Input quality or suitability

The quality and suitability of a particular input is a further source of uncertainty. Chemicals, in particular, are often very specific and very expensive – and farmers will be reluctant to apply them unless confident of their suitability. Unviable seeds are another problem. Whilst suppliers may willingly replace or refund when this happens, planting has to be repeated and the ideal sowing date has passed.

Export market concern with the use of inputs

Some farmers are aware of northern market concerns about the use of chemicals, and in some countries there may be a small local market for organic products. Organic export schemes are beginning to spring up in developing countries – in some cases merely putting a more profitable label on long established practices. This may add to farmer uncertainty on the use of purchased inputs – particularly inorganic fertiliser, chemicals and GM crops – because of his/her concern to be able to market the crop, or because of concern over local environmental harm.

Commercial context

There are a number of ways in which the overall commercial context affects the use of purchased inputs. These issues overlap with some of the other topics already discussed, but as a group they offer an additional explanation for overall levels of input use. These issues were highlighted particularly by stakeholders at the workshop in Uganda – where most farmers were characterised as operating partly or largely in a non-commercial way, with important exceptions arising in areas bordering Kenya, where marketing is easier, and has taken place without disruption for a much longer period than is typical elsewhere in strife-torn Uganda.

Output marketing and price expectations

Farmers' expectations of being able to market their crop at a remunerative price are an important determinant of willingness to use purchased inputs. Although market prices may vary, some will be subject to larger swings than others (the Ugandan maize example, for instance). With sufficient experience, farmers may nonetheless develop technology strategies which are robust in the face of expected price variation, or where resources permit may be able to take a calculated risk on the likelihood of covering costs.

Financial discipline

Where debt amnesties and subsidised credit programmes have been common, it may be more difficult to establish viable credit schemes than in situations where those taking out loans expect to repay them. Viable credit schemes need to have the capacity to impose penalties, but if these become the norm rather than the exception, the cost of enforcing repayment may become excessive. Small-holder credit schemes in Uganda and Zimbabwe provide contrasting evidence of financial discipline. In the former, there are few examples of viable farmer credit schemes, with strategic default common. A private scheme mounted by one of the cotton companies found that although they had planned to seize assets in the event of default, this was socially and

politically impossible to enforce. In Zimbabwe, however, the private cotton companies have managed to enforce such measures and have achieved very high repayment rates of 98%+ (although interestingly the state-run Agricultural Finance Corporation has suffered high rates of default among the farmers it deals with).

Rural traders

Many parts of rural Africa are poorly connected to local towns, and poorly served by specialist retail outlets, crop traders and transport networks. Although farming is the single most important source of livelihood in most rural areas, it is often extremely difficult to obtain farm inputs. In recognition of this, government offices (often extension units), NGOs, and projects, may market some inputs. The absence of retail outlets is not limited to farm inputs. It affects all sectors, and reflects the limited purchasing power of farming communities.

Critical mass and transaction costs

When taken together, these factors which reduce access to inputs, combine to create an additional disincentive: high and unpredictable transaction costs. Trading in small quantities, to dispersed markets, with irregular, seasonal demand, contributes to high transaction costs (low volume transactions incurring the same fixed “negotiation” costs as those for higher volumes, higher transport costs than could be negotiated for regular or larger shipments, lack of competitive pressure). High transaction costs incurred by the trader translate into higher retail prices, and in addition to these, transaction costs incurred by the farmer contribute to uncertainty and conflict with alternative use of his/her time and resources.

Farming as a business

In Uganda, it is often argued that years of civil strife made many farmers adopt low risk, food self-sufficient farming strategies. In this context, farming was not really a business – more a means of producing food for the household, subject to certain constraints. Although most parts of Uganda are now more secure, commercial sector development is only taking place slowly. Yet where increased pressure on land necessitates greater use of purchased inputs, it is useful to emphasise the *business* aspect of farming – because it is only within this financial and trading context that farmers are likely to recognise that careful use of selected purchased inputs is a viable strategy. The situation in Uganda is probably more extreme than that experienced in many countries, but the principle nonetheless has wide application. Farmer willingness to use purchased inputs depends in part on the overall commercial environment, including the extent to which farming decisions are influenced by business (profitability) criteria.

IMPROVING ACCESS: RECENT EXPERIENCE AND BEST PRACTICE

The purpose of this section is to provide readers with a menu of practical ways in which constraints to purchased input access can be addressed. Drawing on recent (90s) African experience, the material is presented in two main sub-sections:

- the use of credit to improve access to purchased inputs
- mechanisms to improve input access that do not rely on credit

These different approaches were developed as a response to different country and farmer circumstances – and each has its strengths and weaknesses.

The section concludes with an assessment of the extent to which the various approaches reviewed address the five issues discussed in the previous section: affordability, availability, information, risk and uncertainty, and commercial context.

Using credit to improve access to purchased inputs

Four approaches are discussed:

- contrasting cotton farmer credit schemes used in (1) Uganda and (2) Zimbabwe
- intensively managed outgrower schemes, and
- extending banking services to small-holders

Cotton companies taking a joint loan to provide inputs for farmers in Uganda

Liberalisation of the cotton sector in Uganda led to substantial private investment in ginning. Ginning capacity greatly exceeded the cotton harvest. Farmers, who had bitter memories of low state-controlled cotton prices and an unreliable voucher payment system, were unwilling or unable to buy inputs (even seed). Whilst the cash payments made by the privatised ginneries were gradually attracting more farmers back into cotton, this alone seemed insufficient to boost output as rapidly as the ginneries hoped. The initial response by one of the larger ginneries was to launch an ill-fated input credit scheme (for seed and pesticides). The scheme proved disastrous as the majority of smallholders defaulted on their loans, due to a combination of side-selling (avoiding repayment of loans by selling to another ginner) and a poor harvest (it was the *El Nino* year). It proved impossible to enforce the purchase agreements, and attempts to seize assets proved unworkable.

In order to remove the possibility of side-selling, the Uganda Ginners and Exporters Association (UGEA) was formed, with compulsory membership of all cotton ginneries. For the 1998/1999 season the UGEA financed the input credit scheme from a Bank of Uganda loan, guaranteed by the Ugandan Government. The Cotton Development Organisation (CDO), a parastatal formed when the sector was liberalised to provide co-ordination and regulatory services, played a critical role in the development and operation of the input credit scheme. The CDO has co-ordinated the distribution of cottonseed and pesticides. Smallholders are free to sell their seed cotton to any ginner. The ginneries are responsible for loan repayment, and these costs are met through a levy payable against volumes of cotton ginned by each ginner. (Volumes are assessed

by independent monitors assigned to each ginnery). Average (not individual) input costs are factored into the seed cotton price paid to farmers (and all farmers, bar those registered in an organic scheme, receive the same cotton price irrespective of the quantity of inputs supplied to the individual farmer). Side-selling is prevented by removing the option of selling to alternative buyers: all ginners are members of the UGEA so it is impossible for a farmer to sell cotton to buyers outside the scheme. Levy avoidance by individual ginners has been reduced by the presence of monitors in the ginneries, and dialogue with border officials and spinning factories, where ginners (or farmers) may try to make illegal sales.

The scheme is certainly not problem-free and suffers from:

- difficulties assuring the timeliness of input delivery
- diversion of inputs by intermediaries responsible for their distribution, or attempts to charge farmers for the inputs at the point of delivery
- inputs given out to non-cotton farmers and cotton farmers going without
- farmers using the inputs on other crops, or selling them
- too few spray pumps with which to apply the chemicals
- farmers cannot make their own production decisions based on real prices
- all farmers selling cotton to the ginners pay equally for the cost of the scheme (through the seed cotton price) irrespective of individual input use
- critics contend that the scheme is vulnerable to rent-seeking at all levels

Moreover, the sustainability of the scheme is in question on account of: the element of subsidy (its first year of operation turned out to be heavily subsidised by the Government guarantee because the levy on cotton volumes ginned was based on an over-optimistic harvest forecast, plus CDO's own co-ordination inputs are currently provided without charge to the industry); the absence of capacity-building to help farmers make appropriate production decisions; and "leakage" of inputs which may threaten the intended impact on output. Yet for the next year, the ginners plan to take out a commercial loan, with private crop insurance to cover a shortfall due to natural disaster – and this "stake" should provide inherent pressure (on CDO) for a higher quality (less leaky) operation.

A scheme with so many problems cannot be described as a model – yet it is an interesting example of a pragmatic stop-gap measure to increase farmer productivity. Its coverage is impressive – around 300,000 small-holders who are, to a certain extent, self-selecting resource-poor farmers (because although now low-risk, cotton is not very profitable, and therefore unattractive to farmers with other choices or able to bear more risk). The challenges are essentially two-fold: to improve on the operation so that the benefits are maximised whilst containing the cost; and to simultaneously build longer-term farmer capacity through extension and group activities.

Cotton companies in Zimbabwe providing inputs on credit to farmers.

In contrast to Uganda, there has been no co-operation between the three ginning companies in Zimbabwe, although all rely to some extent on small-holder cotton production. Two of the companies operate input credit schemes. Both companies have a similar approach for overcoming the problem of side-selling:

- All borrowers belong to groups of cotton smallholders. Default by one member of the group brings retribution to the whole group, which may be subsequently excluded from the scheme. This increases incentives to repay. It also encourages group members to monitor and help one another to ensure that there is no default.
- Groups performing well receive cash rewards.
- If defaulting occurs, the companies act swiftly and come down heavily on defaulters, seizing assets when necessary.
- Local agents of the cotton companies are in year-round contact with smallholders, building closer relationships and a sense of loyalty to the company.
- Additional services are provided in addition to the input credit: extension advice is provided, and one company has recently introduced cash loans. Again, these additional benefits of “belonging” to a company help to strengthen relationships and loyalty.

Individual farmer participation in the input scheme depends on repayment records, acceptance by other members of the group, and the achievement of a certain minimum yield. Around 25% or 50,000 small-holder cotton farmers participate in the schemes, and in contrast to the Ugandan situation, these tend to be the more able farmers. The schemes are intended to help such farmers expand production, whilst other farmers are expected to make cash payments for inputs.

Schemes in both countries are still in their infancy. In Uganda, the performance of the UGEA scheme cannot be fully judged because it has only been running for one season. Box 1 compares the performance of the two schemes based on the information currently available. One interesting conclusion is that although the Uganda scheme is far from being a model farmer credit scheme, its coverage (and in particular, its ability to reach poorer farmers) is extremely impressive. The Zimbabwean schemes may represent best practice in credit delivery, but the beneficiaries are principally (and deliberately) the more able farmers.

Box 1: The performance of the cotton input schemes in Uganda and Zimbabwe

Judgement criteria	Countries	
	Zimbabwe	Uganda
<i>Repayment</i>	1997/1998 season repayment rates for the two schemes were: 98% and 100%	Only 50% of input loan repaid (see footnote)
<i>Coverage</i>	1998/1999 season (both schemes): 53,000 smallholders This represents about 25% of smallholder cotton farmers – generally farming on communal or resettled land (small plots, unirrigated, and typically on marginal land).	For 1998/1999 season. Cottonseed distributed to around 300,000 smallholder farmers, typically farming on small unirrigated plots. The scheme is intended to reach all cotton farmers (except those enrolled in a separate organic scheme)
<i>Efficient use of inputs</i>	Although no data are available, inputs are likely to be used efficiently. <ul style="list-style-type: none"> • Input use is closely monitored and extension advice is provided. • Farmers pay for inputs so have good reason to use them wisely • Inputs are supplied at cost price (cheaper than local market prices due to bulk buying by cotton companies and no retail margin). 	Again, no data are available. However, inputs are free at the point of delivery to farmers, with the cost deducted uniformly from farmgate prices – regardless of the volume of inputs supplied to individual farmers. This weakens the incentive to use inputs efficiently. To combat this, monitoring and extension advice is provided – but reports of diversion of inputs and late delivery were widespread.
<i>Subsidies</i>	One scheme includes a small element of concessional funds from a former World Bank loan at below market interest rates, whilst the other scheme is partly reliant on low interest Agric Finance Corporation loans	UGEA used donor funds loaned at below market interest rates – backed up by a Government guarantee. CDO do not charge for the logistics support provided (Govt/donor funds used for this) UGEA's inability to repay loan amounts to 50% subsidy ²
<i>Contribution to cotton sector development</i>	Small-holder credit contributes to increased production – but significant numbers of producers do not use it	Production credit almost certainly a critical component in cotton sector recovery. UGEA plan to continue scheme with commercial loan and insurance cover.
<i>Wider development impacts</i>	Potential to expand financial services available to cotton farmers (eg savings schemes) – with wider development impacts Group approach helps build community-level capacities	Whilst cotton production may increase farmer incomes, the present input scheme does not contribute to wider farmer benefits relating to eg., group capacity- building and financial discipline

² Repayments were calculated on a per kg of seed cotton ginned basis, and assumed an improbably large harvest of 150,000 bales. The use of this figure (rather than a more realistic estimate) made the scheme more attractive to ginners, and politically easier to sell to farmers (to the extent that they had any voice in this). In the event a harvest of only half this amount was achieved, with the Government guarantee effectively providing a 50% subsidy on the loan taken out by ginners (ie meeting half the repayment costs - both interest and principle).

Zimbabwe's experience with intensively managed outgrower schemes

The term "outgrower scheme" is often reserved to describe schemes where the agri-business has considerable control over the smallholder production process, providing a large number of services, such as input credits, tillage, spraying and harvesting. The smallholder provides land and labour in return for this comprehensive extension/input package. The high value horticultural export sector is currently the focus of considerable outgrower scheme development (for example Hortico in Zimbabwe and Homegrown in Kenya).

European supermarkets are the main market for horticultural exports from sub-Saharan Africa. Quality requirements are exacting in terms of physical appearance and food safety, which in turn requires highly developed technical and managerial production skills. In addition, the supermarkets need to be able to trace produce back to the grower. Together, this implies a very close working relationship between the farmer and the exporter, and a sophisticated system for providing agricultural services. In these schemes, the high cost of the service provided by the company involved is justified by the high value of the final product.

Hortico in Zimbabwe operates an outgrower scheme producing and exporting babycorn and *mange-tout* beans to the European market. Success has been achieved by establishing a thorough supervisory system and rigid enforcement of standards. By early 1999, 3,000 farmers were contracted to sell their produce to Hortico at a price guaranteed at the beginning of the crop cycle. Sixty percent of participating farmers are women. The amount grown by each farmer is restricted. This ensures that production of other crops is not neglected, whilst adequate attention is devoted to the export crop. Training, technical support, inputs and spraying are provided by the company, and farmers provide labour, land and irrigation (using watering cans). Contact between the company and the farmer is frequent – a lorry visits each farmer every second day. This reduces the possibility of side-selling. Cost recovery on inputs is nearly 100 percent.

Close monitoring of farm operations, a high level of technical support, and frequent contact with the smallholders, are required to operate outgrower schemes successfully. There may be scope for increased use of producer groups to reduce costs of the schemes and allow some of the services provided by the company to be assumed by the group. Such schemes allow smallholders to participate in high value export sector development, producing very specific products to exacting standards, whilst export companies find that the labour-intensive nature of some of the crops is ideally suited to small unit operations.

Piloting rural banking services in Uganda

In 1998 Uganda's Centenary Bank commenced a pilot scheme targeting financial services to smallholders. The scheme is currently operated at one branch only (Mbale), though if successful it will eventually be extended to all their branches (currently 12, though planned to increase to 24 by 2002).

The underpinning philosophy of the bank is that the emphasis should be on the ability of the borrower to repay a loan, rather than security of the loan. In other schemes

where loan security has been the over-riding concern, mechanisms such as group-lending have been used so that peer pressure can substitute for collateral. Regular and frequent repayment instalments are another means by which loan security (ie repayment of the loan) can be safe-guarded.

The Centenary approach places the emphasis on ability to repay. Loans are made against a projected cash flow. Household budget analysis is key: after the initial application, a Bank Field Officer visits the household to carry out an analysis of household income and expenditure, based on all income (on-farm and off-farm), and all household expenditures. From this, an estimate of household cash flow, with and without a loan, can be made. Loans are made when it is clear that the loan can be repaid. Repayment terms are then tailored to fit the cash flow analysis. The field officers are qualified agronomists who have also been trained in rural finance. As such, they are able to recognise the agricultural potential of a farm, and judge the profitability of the activities that will contribute to loan repayment.

Although security is not the basis on which the loan is made, a variety of tools are used to at least partially secure the loan: guarantors; land titles (including those for customary tenure); post-dated cheques (it is a criminal offence to have a cheque bounced in Uganda); seizure of assets; and using standing crops as collateral.

In Uganda the scheme is particularly innovative, because recent experience with loan schemes has been very poor. (Civil war, free input schemes, and frequent loan amnesties have been blamed for this). Early indications are that the scheme is viable – and will be extended to other parts of Uganda.

Improving access to purchased inputs without using credit

Credit is so often considered a key issue in expanding small-holder access to farm inputs, that a surprising result of the NRI research and workshops in Uganda and Zimbabwe, was the wealth of experience with schemes which deliberately avoid such an approach.

Six approaches are described here:

- a seed and fertiliser hand-out scheme in Malawi
- a scheme to sell inputs when farmers have available cash in Zimbabwe
- tailoring seed services to farmers' needs in Uganda
- strengthening the informal seed systems
- strengthening commercial input distribution networks in Uganda, and
- public/private partnerships in farm inputs and extension in Zimbabwe

The Malawi Starter Pack Scheme

The packs are intended to meet a short-term food security need and address the longer-term issue of declining soil fertility. They are a response to growing food deficits and poverty in Malawi, and fertiliser which is too expensive for most farmers following the economic reforms of the 80s and 90s. The packs contain cereal and legume seed, and fertiliser. Each rural household receives one pack, enough for 0.1

ha or 60-100kg of additional maize. The scheme is an initiative of the Malawi Government and donors.

The scheme commenced in 1998, with the distribution of 2.53 million packs. The actual cost of the project was \$25.12 million (approximately 70% more than anticipated). The distribution of the packs (involving government agents as well as contracted services from private transport companies and NGOs) worked well with relatively few problems considering the scale of the operation and the time available.

Preliminary findings (Kate Longley, personal communication) indicate that few households followed the instructions to plant a 0.1 ha plot with seed and fertiliser. The instructions were written in Chichewa, and not understandable by non-Chichewa readers or non-literate people. Where farmers chose not to use fertiliser or seed, this was more due to the view that fertiliser was unnecessary or the seed inappropriate to the location than the desire to sell the inputs. The groundnut seeds were regarded as being of poor quality and seldom planted. Where they were, germination was poor. Government field assistants did not provide much advice to smallholders. A lot of their time was spent in registration and distribution, which interrupted normal activities.

The incremental yields appear to be between 60 and 80 kg. Highly variable output prices make it difficult to put a precise value on this output but preliminary indications are that the return on the cost of the pack is only 1:1. In spite of its longer-term objectives of the gradual (over 5 – 10 years) spread of improved technologies among smallholder farmers, the starter pack scheme is largely perceived as a free inputs scheme, and a short-term safety net.

Selling cotton inputs in Zimbabwe when farmers have sufficient cash

In Zimbabwe three companies buy and gin smallholder cotton. The smallest of the three does not operate an input credit scheme, and has no plans to do so. Company officials consider input credit unnecessary because their supply requirements can be met from large-scale producers and from smallholders outside the other companies' input credit schemes. In addition, they wish to avoid the significant administrative burden they perceive from operating such a service. Instead of being offered credit, farmers can purchase inputs for the following season when they sell their seed cotton, with no obligation to sell them the next season's crop. Such a system has the advantage of not indebting smallholders, who in the current economic climate (in November 1998 annual inflation was 35%, and market interest rates were over 40%) may be reluctant to take credit for fear of long term indebtedness. High inflation also makes advance purchase of inputs attractive to those farmers who can afford to do so.

Tailoring seed services to farmers' needs in Uganda

The Uganda Seed Project (USP) is a parastatal established in the 1960s to meet smallholder seed requirements. Its operations include extensive contract farmer seed multiplication schemes, quality assurance and seed distribution. It concentrates on maize and beans – although smaller volumes of other grains and oilseeds are also supplied. As of 1999, plans are being made to privatise a large part of its operations.

In the run-up to privatisation there has been considerable analysis of the problems it has faced and the implicit challenge to a new owner.

There are about 2.5 million farm families in Uganda who must use seed from one source or another. The vast majority of them are small-scale farmers. Uganda's agro-ecological conditions permit the cultivation of a diverse range of crops. Theoretically this should offer enormous opportunities for seed companies. In practice, however, the use of improved seeds has eluded the majority of farmers. Of the estimated annual seed requirement for maize (10,000 tonnes) and beans (90,000 tonnes) only 15% and 1% respectively are supplied by the formal seed sector. Box 2 summarises the issues confronting USP in meeting farmer demand.

Box 2: What farmers need from seed suppliers	
<i>Technical effectiveness</i>	<ol style="list-style-type: none"> 1. good performance under farmer conditions/constraints 2. known response under different weather patterns or in different agro-climatic zones
<i>Reliable quality</i>	<ol style="list-style-type: none"> 1. quality often not obvious until crop maturity/harvest so quality assurance particularly important 2. genetic quality hard to guarantee with old varieties (used in Uganda for beans and groundnuts) – requires deliberate, rigorous maintenance breeding scheme 3. need robust systems to assure physical and physiological quality 4. inefficient delivery systems, poor infrastructure, the hot humid climate and low levels of farmer literacy, have also contributed to quality assurance problems
<i>Availability</i>	<ol style="list-style-type: none"> 1. timeliness 2. availability at location convenient to farmer 3. supply of crops/varieties farmers want – concentrating on those which informal channels cannot service
<i>Pricing</i>	<ol style="list-style-type: none"> 1. farmer willingness to buy seed depends partly on multiplication factor and market value of crop 2. farmers less willing to buy seed which is costly (low multiplication factor) unless crop has high market value 3. low yields compound reluctance to use purchased inputs
<i>Packaging</i>	<ol style="list-style-type: none"> 1. required unit size (ie in small units) 2. provides adequate protection/quality assurance 3. provides information

Adapted from: Muhhuku, 1999.

Providing small-holders with seed at a price they can afford is not likely to be problem-free for any organisation in Uganda. Climatic variability, poor infrastructure and security problems all play a role in this. However, the USP experience does provide some lessons and some of these can be addressed with appropriate investment and systems, irrespective of the exogenous constraints on supply.

Informal seed systems

Farmer sources of seed can be divided into 4 categories: own seed; neighbours; local market; and commercial seed. The informal system comprises the first three. In Africa, farmers are often said to be dependent on informal sources for 90% of their seed needs. Table 2 illustrates this with data from the Machakos area in Kenya.

Table 2: Seed sources as a percentage of total seed use in Machakos area, Kenya (short rains, 1983)

	Own seed	Commercial seed	Neighbours	Local market
Maize	83%	12%	1%	4%
Sorghum	77%	8%	8%	5%
Beans	89%	2%	2%	7%
Cowpeas	80%	2%	8%	10%
Pigeon peas	81%	1%	2%	15%

Source: Muhammed *et al.*, 1985, and de Bruijn *et al.*, 1994, cited in Longley and Richards, 1998.

Informal seed systems are likely to remain important. Even in developed countries, a significant proportion of seed planted has been retained from the previous harvest. Once farmers have first acquired improved open-pollinated varieties, they may subsequently use saved seed or informally traded seed. Vegetatively propagated planting material, such as cassava, is almost entirely dependent on informal sources – a point that became abundantly clear when cassava mosaic disease in Uganda suddenly created a need for large quantities of clean planting material which could not be met initially by local sources.

In addition, agricultural systems in Africa are subject to rapid change as a result of market liberalisation (and changes in prices that affect choice of technology and crop) and pressure to intensify. This means that informal seed systems, notwithstanding their present effectiveness, will have to adapt and change to meet different needs. This may have implications, for instance, for varietal selection and storability. NRI's work in Kenya, Malawi and Ghana has indicated strong demand for improved varieties – and anecdotal evidence from Uganda echoes this, at least for open-pollinated varieties.

Box 3 explores three aspects of informal seed systems: their attributes (both positive and negative); ways in which they can be strengthened; and intended outcomes. This is analogous to current thinking in rural finance – where there is a perceived opportunity to build on the strengths of informal systems (notably in outreach), with some of the knowledge or technology used by the formal system. There is very little experience in either area, and a need to pilot and review such models.

Box 3: exploiting the potential of informal seed systems

Attributes of informal seed systems

1. May be considered better value for seed which is:
 - bulky and therefore incurs high transport costs (eg grains and legumes)
 - openly traded (eg grain) such that farmers know the price (eg grain)
 - easily stored
 - self-pollinated (and hence subject to slow genetic deterioration)
2. May be the only source of crops and varieties needed in small quantities to meet local preferences, or suited to local, temporary, or evolving conditions; local varietal selection tends to yield seed which performs well locally
3. Likely to be more accessible in rural areas
4. Informal sources can supply seed on a timely basis (or not at all)
5. Informal systems are more robust in the face of major disruption (such as civil war) but more vulnerable to local climatic risk than formal systems sourcing seed more widely; aid agencies buy seed in Uganda for relief programmes in neighbouring countries, and these “lumpy” purchases lead to extreme volatility in the prices and availability of formal sector seed
6. Some crops which are almost entirely dependent on informal seed systems (roots and tubers) are also those valued by farmers vulnerable to disaster (whether man-made or natural) because they can be kept in the ground until needed
7. Informally sourced seed cannot be certified, but it can be “truthfully labelled”
8. The quality of farmer-saved seed tends to be very good but subject to very variable storage management (work by NRI in Zambia and Ghana suggests that these practices are often “passed down” and probably not discussed that much within the community); seed management also tends to fall outside the extension system (extension officers often take leave after the harvest, and are pre-occupied with their own demonstration plots at planting time)

Ways in which informal seed systems can be strengthened

1. Providing them with access to NARS/IARC-bred foundation (/breeder) seed
2. Extension advice on seed production, processing, treatment and storage
3. Supporting a legal framework that permits the marketing of uncertified, “truthfully labelled” seed which would conform to the prescribed standards regarding the genetic purity, germination and moisture content for that variety, except it would not carry an official certification tag

Intended outcomes

1. Greater availability, accessibility and affordability of seed which has locally preferred characteristics
2. Improved quality and reliability of informally-sourced seed
3. Greater integration of modern varieties into traditional seed systems
4. Identification and wider dissemination of local varieties whose characteristics make them suitable for wider cultivation.

Strengthening commercial input distribution systems in Uganda

The Ugandan Government's Agribusiness Development Centre (ADC), with support from USAID, has done considerable work on the intensification of maize and bean production. This focuses on the use of improved seed, fertiliser and crop management, sometimes with small quantities of chemicals, to increase yields and reduce costs of production. ADC works with the extension services and NGOs to expose farmers to these technologies - using small demonstration plots (to compare traditional and improved systems), field days and farmer site supervision to reach approximately 120,000 farmers per annum. Rather than using credit, farmers have been encouraged to draw on their own resources, and to make these investments a high priority. ADC stresses the business management aspects of farming.

Rural areas are poorly served by farm input networks and farmers usually lack information on purchased inputs. An additional focus for ADC has therefore been to try to bring inputs physically within reach of farmers, by providing support to the input supply chain: wholesaler importers, district distributors and village stockists. The support provided under ATAIN (Agent Training and Input Network) comprises:

- mediation between the parties concerned
- a loan guarantee (on which there has so far been no call)
- training (product knowledge, safe use and handling, marketing, record-keeping and business management).

ATAIN facilitates trade between five regional distributors and village stockists, by guaranteeing small loans (made in the form of inputs advanced) to the stockists by the distributors. There has been no call on this guarantee so far, and stockists are not aware that the guarantee exists. There are roughly 180 stockists participating in the scheme – and all have benefited from the guarantee.

The stockists also provide critical extension on the products – and the product training provided to the stockists has proved to be one of the most popular components of the project. Just as stockists are able to be extensionists, some government extension agents have become stockists as well. If these distribution systems can be sustained, the challenge will be to maintain objectivity in the advice provided by stockists.

Should stockists choose to advance inputs to their customers, without first receiving full payment, ATAIN has no role in this transaction. (Certainly such arrangements occur – and village-level stockists are well-placed to assess the credit risk before entering into such informal agreements). An estimated 30-40,000 farmers have benefited from improved access to inputs. Despite these achievements, and the fact that ATAIN is operational in one of the most agriculturally progressive parts of Uganda (Mbale and Kapchorwa), small-holder demand for inputs is still very low (around 500 tonnes of fertiliser/season).

ADC is also working on output marketing to enhance farmer confidence that his or her harvest will be sold at a fair price. This pilot scheme illustrates the potential to improve access to inputs and underlines the importance of co-ordinated action on technology transfer, input supply and output marketing.

Public/private partnerships in farm inputs and extension in Zimbabwe

With growing emphasis on the communal sector in Zimbabwe, input companies are turning their attention to this potentially large market. Box 4 describes a number of pilot initiatives experimenting with ways to increase communal farmer access to purchased inputs. Each of these has different characteristics but all use partnership approaches and incorporate extension. (Although one of these also uses credit, it is included here to illustrate the potential when different players collaborate).

Box 4: Piloting public/private partnerships in extension and inputs in Zimbabwe

- input supplier links with the Grain Marketing Board, Zimbabwe Farmers Union and transport brokers to reduce transport costs and exploit warehouse storage available in rural areas
- input supplier links with cotton marketing companies to sell inputs at the point of cotton sale (orders are taken, paid for, and farm delivery subsequently made by the input company)
- input company linkages with other input companies, government extension services and farmers groups, with extension costs met partly by the input companies³, without strings attached
- input companies working with NGOs and local retailers to support the development of local retailer networks (by providing training and loan guarantees)
- collaboration between cotton companies, banks and input supply companies, to transfer farmers who reliably repay input loans from company schemes to bank schemes, with the banks aiming to strengthen their rural outreach and savings mobilisation.

Alternative approaches to input constraints: how they compare

Box 5 summarises how each of these schemes affects the key constraints identified in the previous section. The schemes' impacts are fairly evenly spread across the five constraints (affordability, availability, information, risk and uncertainty, and commercial context) – and virtually all schemes perform well in at least four of the five areas. Most of the schemes help reduce risk by providing farmers with better information (on the appropriate input to use, and recommended methods of application) or by an explicit link to crop marketing. The table could be used as a check-list to identify areas for improvement in poorly performing schemes. The Malawi scheme, for instance, would be improved by better extension on the inputs distributed, and recommended practices.

³ For instance, Novartis has been working with a number of local companies and supplying Agritex staff with motorbikes, which they subsequently are able to buy, with payment by instalments.

Box 5: How different input schemes affect key constraints to farmer use of purchased inputs					
Scheme	Affordability	Availability	Information	Risk and uncertainty	Commercial context
Uganda credit	More affordable – factored into crop price	Improved – but timeliness still a problem	Information on input package	Risk reduced and decision taken out of farmers' hands	Little or negative effect
Zimbabwe credit	Improved – via credit	Little direct effect	Package includes extension	Links to crop marketing reduce risk	Reinforces commercial approach
Outgrower schemes	Improved – input credit integral to package	Improved access to marketing system and required inputs	Package includes extension	Risk reduced and decisions taken out of farmers' hands	Participation in export development – though approach is rather paternalistic
Centenary Bank	Improved – by credit	No direct effect	Some additional extension advice	Reduced a little through extension and planning advice	Farmer encouraged to be “business-like”
Starter packs	Improved – inputs are free	Improved – otherwise hard to obtain	Some extension – but inadequate	Free inputs shield farmer from some consequences of risk and uncertainty	Little or negative effect
Input sales when crops sold	Improved by timing of sales	Inputs made available at location suited to farmer	Little direct effect	Little direct effect	Farmer encouraged to be “business-like”
Farmers' seed needs in Uganda	Improved by small unit size	Timing, location and seed type all important	Little direct effect	Risk reduced if seed is of reliable quality	Farmer can more easily develop farm business
Informal seed systems	Affordable local sources	Improved	Reinforces informal sources	Risk reduced – locally suitable	Farmer can more easily develop farm business
Building commercial input systems in Uganda	Little direct effect	Vastly improved	Retailers give product and safe use information	Information and crop marketing component helps reduced risk	Farmers can more easily plan/develop farm – and commercial networks expand
Partnerships in Zimbabwe	Some effect on costs via more efficient use of transport	Improved services – including delivery of inputs to farm	Improved through collaboration on extension	Information helps reduce risk	Helps develop rural economy and services

PRIORITIES FOR POLICY AND DIRECT INTERVENTION

Getting the private sector involved in small-holder input credit

Developing viable smallholder input credit schemes

Credit is often considered the major issue in increasing farmer access to purchased inputs. Yet smallholders are almost invariably very poorly served by the formal financial sector on account of high transaction costs associated with small loans, a dispersed rural clientele, and a poor information on crops and marketing. In some situations, however, the private sector (notably processors or traders) may be willing to extend input credit to smallholders in order to overcome a supply constraint. Box 6 summarises the factors that influence the viability of such input credit schemes.

Box 6: Factors which affect viability of commercial crop input credit schemes		
Factors/aspect	Effect	
<i>Crop market characteristics</i>		
1. Crop purchase monopoly and little food/farm use of crop	+	*
2. Possible for all buyers/users to form association and little food/farm use	+	*
3. Multiple marketing channels and/or food use	-	
<i>Input qualities</i>		
1. Inputs provided in-kind	+	
2. Limited alternative use or market for input	+	*
3. Returns to input use are greatest for the crop in question	+	*
<i>Commercial/credit context</i>		
1. Farmers treat farm as a business and are integrated into markets	+	
2. History of loan amnesties, default without penalty, subsidised inputs	-	
3. Supportive legal/political/contract enforcement institutions	+	*
<i>Modus operandi of scheme</i>		
1. Group schemes for peer pressure	+	
2. Group or individual schemes backed up by monitoring/good information, support staff, and ability to act	+	
3. Incentives for repayment and penalties for non-repayment	+	
4. Appropriate incentives for field monitors/co-ordinators	+	
5. Training provided to farmers – extension and business management	+	
6. Developing relationship/trust/loyalty through field presence/contact	+	
7. Accessibility of scheme – minimise red tape and transaction costs; organise so location and timing of contact is convenient to farmers	+	
8. Effective and timely monitoring of input use and crop marketing	+	
<i>Note: * denotes killer assumption</i>		

The significance of these categories, and particular aspects, is that they need not all be present for a scheme to work, but most schemes will need to incorporate several aspects to ensure a degree of success. For instance, the Ugandan cotton example relied on the buyers forming an association (crop market characteristic 2), but for the scheme to succeed it was also necessary for inputs to be provided in-kind, and to incorporate several measures from the *modus operandi* group (eg., monitoring, extension and accessibility). The scheme can then function, even if the overall commercial context is weak.

The Zimbabwean cotton credit example indicates that even when few favourable crop market and input conditions are present (fertiliser and cash (!) are available on credit in Zimbabwe), it is nonetheless possible to develop strong and viable input schemes. The success of the schemes in Zimbabwe is very dependent on the presence of favourable conditions relating to overall commercial context, and *modus operandi*.

So-called “killer assumptions” are also identified in Box 6, ie. conditions which would be favourable (for the operation of a credit scheme) if in place – but rarely are so. They include: crop purchase monopolies, which are increasingly rare; situations where all buyers can form an association effectively creating a crop purchase monopoly; inputs that have no other use or cannot be put to any other comparably profitable use; and supportive institutions for contract enforcement (the importance of which is particularly stressed by Dorward *et al.*, 1998). The latter is included because although many countries may have appropriate legislation or policy, there are often compelling political economy, implementation and access factors that prevent its effective operation at local-level, or for particular groups. Also, the buyers’ association approach (similar to the Uganda cotton example described earlier) may be difficult to apply in practice, because of unwillingness to take joint action. The fact that these favourable conditions rarely apply means that a viable scheme is necessarily dependent on several measures which could be described as best practice in lending to small-scale farmers.

Best practice in rural credit, in company input schemes and other loan programmes

Box 6 lists a number of carrot and stick measures (under *modus operandi*) – which do not depend on unrealistic assumptions about, for instance, the ability to enforce contracts using legal mechanisms (which even if possible, would probably be very transaction costs-intensive). Their focus on groups, training, monitoring and incentive systems makes them initially costly – but once in place, farmers can take on a greater share of these costs (groups can act as crop assembly points, and distribution points for inputs – reducing the transaction costs inherent in reaching many small farmers). Moreover, these measures build group/individual capacity so that farmers are able to combine their knowledge of, for instance, land characteristics and agronomy, with information about inputs, and use this to make informed decisions about input use. Without this capacity building, technology packages tend to be inflexible (and therefore not ideal in all situations) or very costly in terms of extension (as seen, for instance, with some of the intensively-managed small-holder outgrower export horticulture schemes in Africa). Nonetheless, the implicit start-up costs, and the fact that the benefits are long-term (and also, far wider than just the crop in question) mean that they are only likely to be attractive to companies able to take a longer view.

Such best practice mechanisms in rural lending are robust to different situations. For instance, they are similar to the measures used by Grameen Bank type schemes – where inputs are not necessarily provided in-kind or targeted to a particular crop. This approach, moreover, yields benefits even where the marketing structure does not demand such an approach. (The cotton company in Mali, for instance, which has a crop purchase monopoly, nonetheless uses virtually all of these measures to reduce transaction costs and increase cotton output). There seems to be a clear lesson here for Uganda too: whilst it is difficult to envisage a preferable viable alternative to the existing scheme given current conditions and circumstances (and this is true, despite all the problems in the operation of the input scheme), it does not obviate the necessity and desirability of investment in longer term measures aimed at more sustainable and substantive improvements in small-holder productivity. At the same time, it may be more difficult still to get commitment to such long-term goals amongst a large group of companies (approximately 30), including many that have only participated reluctantly in the scheme.

Non-credit mechanisms that make inputs more affordable

Subsidy is not the only option

In the absence of credit, there are nevertheless a number of other ways in which inputs can be made more affordable for small-holders. In Malawi, inputs were distributed free of charge to farmers – but this must be regarded as an exceptional response to an evolving crisis. There are many other ways to improve affordability, without reliance on a public subsidy.

Making inputs available in the small quantities farmers want

In Uganda, seeds could be made available in packet sizes more closely suited to farmer needs. Had appropriate packing plant been installed from the outset, this would have added little to per unit costs of seed.

Selling inputs when farmers have the cash to buy them

In Zimbabwe, input and cotton companies have collaborated to sell next season cotton inputs when farmers sell their cotton harvest. This arrangement is beneficial to all concerned – without locking the farmer into a credit agreement that s/he may find difficult to honour, and the cotton company may find costly to monitor/enforce. From the cotton company's perspective, it is a relatively low-cost way to promote increased cotton production, whilst the input company can make extra sales with relatively low transaction costs. (Inputs are delivered to the farmer subsequently – so transport costs are incurred by the input company – but savings are made in rural retail and storage costs).

Reducing input marketing and distribution costs

In Zimbabwe there has been collaboration between the cotton companies, the input companies, transport companies and the banking sector, to reduce the cost of farm inputs and services. Information has been shared to enable transport costs to be

reduced by the co-ordination on input and output marketing. The banking sector has been able to “adopt” reliable agricultural borrowers (with the banks benefiting in the medium-term from access to rural savings), enabling the cotton companies to achieve greater coverage with their own loan programmes.

Addressing other factors that constrain smallholder access to purchased inputs

All the interventions described in the previous section addressed some of the other four issues identified: availability, information, risk and uncertainty, and commercial context. One scheme addressed these whilst not addressing affordability at all.

Availability

Improved availability of inputs is emphasised by most of the schemes reviewed. There is good reason for this, and much evidence to suggest that it is a more important constraint than affordability. IFDC (1990), cited by Larson and Frisvold (1996), reports that on average, farmers in sub-Saharan Africa must travel 18 miles to the nearest fertiliser supply point. Larson and Frisvold’s conclusions (*ibid*, p522) emphasise the availability constraint:

“Several studies document that the simple physical availability of fertiliser to farmers, in appropriate quantity packages and at the appropriate time of the year, remains a constraint to increasing fertiliser use in sub-Saharan Africa.”

Several authors (including Shepherd, 1989 and Larson and Frisvold, *op.cit*) point to the inevitable role of the private sector in improving input availability. In promoting this role, it is important that consideration be given to the fact that private rural suppliers choose between different products (for example, tinned food, soap powder, and farm inputs). The ATAIN programme in Uganda, which focuses explicitly on the development of commercial input networks, does not emphasise the need to improve returns to fertiliser marketing *relative* to those obtained from other products retailed in rural areas. Rather, ATAIN demonstrates that inputs can be retailed profitably – but the way in which it links this, responsibly, to training in safe and appropriate use of inputs, almost certainly adds significantly to retailing costs relative to those incurred on other products.

Interestingly, the private initiatives in Zimbabwe implicitly take account of this, by using retail points where synergies with other activities (and hence economies of scope) can be exploited (sharing transport costs, and marketing inputs alongside output purchases).

Information

The need for better farmer information on inputs and yield response is widely stressed, and is reflected in the extension component included in some of the input schemes reviewed. The importance of extension in improving the performance of input credit schemes is also widely recognised. Improved information helps reduce the risk and uncertainty to which the farmer is exposed when adopting new technology.

The information constraint is partly an information *flow* constraint, but there are also some fundamental gaps in knowledge on the technical and economic effects of improved use of purchased inputs and other crop management strategies. Although some of the necessary research has been conducted (even if the results are not available, nor the conclusions updated to reflect current prices), much has not – even in countries which have accorded a relatively high priority to agricultural research (such as Zimbabwe). As the pressure to intensify and develop packages which African farmers can and will adopt increases, the need for research and dissemination on farmer-adapted input and crop management strategies becomes more critical.

For example:

“No work has been done to revise, in view of changing soil, variety, and economic conditions, the recommendations developed during the early 1960s...

While introducing fertiliser as an essential input to achieve yield increases is important, it is equally important that the correct message on nutrient requirements by crop and by area is delivered. The information presently available in Uganda on fertiliser nutrient requirements for Uganda’s crops and soils is inadequate”. (IFDC, 1999, pp11-12).

There is a key role here for public-funded research. The private sector is unlikely to do this research – because it would be difficult to recoup such costs through product sales. (Smallholders have limited purchasing power, and the most useful research is likely to focus on synergies between farmer-supplied and purchased inputs). In many countries, a useful starting point would be to collate and review existing information before identifying priorities for revision, updating, and new research.

Risk and uncertainty

In the second section, four categories of risk and uncertainty were identified: weather risk, market risk, uncertainty over input choice and quality, and uncertainty over export market acceptance of produce treated with chemicals.

The schemes reviewed in the previous section relied principally on two mechanisms to reduce risk and uncertainty: the provision of extension advice, to improve farmer knowledge on the correct choice and use of purchased inputs; and links with output markets, such that the farmer would be confident of selling his/her produce. Implicitly, most of the programmes assured “fair” retail prices for inputs, and some were able to offer lower prices on account of bulk purchase orders (eg cotton inputs in Zimbabwe). ATAIN argues that it tackles market risk (ie uncertainty over output price) by improving the overall profitability of the farm enterprise, such that a fall in output price is less critical.

Although farming is to some extent an inherently risky activity, there are some other ways in which risk can be reduced. There is always a degree of weather risk – but in Uganda, the UGEA was negotiating commercial crop insurance to cover the loan taken out for cotton farmer inputs, in the event that natural disaster should lead to a significant reduction in the expected cotton harvest. From the farmer’s perspective,

there may be little that s/he can do to reduce this risk, except by diversifying, and cultivating some known drought-tolerant varieties. New varieties will carry a higher perceived risk, and the risk of crop failure in the event of poor weather conditions may indeed be higher. Moreover, the stakes will be higher still if other purchased inputs have been used.

For some crops, unpredictable output prices are the major risk. Interventions which lead to better market integration (ie smoother flows of produce between surplus and deficit areas) will help reduce (but not eliminate) this source of risk. This might include improvements in infrastructure (roads, telecommunications), financial services (such that traders can more easily finance their operations), deregulation of rural transport and trading to increase competition, and better information on farmer production and market prices. In some countries, where large unpredictable purchases of food crops for relief programmes in neighbouring countries contribute to price volatility, it may be possible for the government to negotiate with the donors to obtain advance notification, and to smooth such purchases (over time and crops) where possible.

Improved information on inputs (including information on input quality assessment criteria) will help reduce the risk perceived by farmers in using purchased inputs. The government can also play an important role in setting and enforcing appropriate product standards – for instance, in seed quality. Where the government is itself involved in the supply of seed or inputs, it should ensure that these meet the highest standards. (A failing of the Malawi scheme was the poor germination rate of the groundnut seed distributed). Farmers often face uncertain prices for inputs too. In Zimbabwe, input company representatives at the NRI workshop proposed that input prices in rural areas should be monitored, because they feared that unnecessarily high retail prices were undermining the scope to develop the smallholder market.

Commercial context

In the second section it was noted that the overall commercial context affects the production and marketing strategies adopted by farmers. This not only affects output marketing options, it influences the availability of retailers/traders willing to supply farm inputs. Transaction costs are reduced as commercial activity increases, and as the rural economy develops, more services become available and affordable in rural areas. Government policies on market reform and competition (for instance in transport and banking), and infrastructure development, influence these trends – though on their own they may be insufficient to fuel economic development in particular areas. At the micro-level, extension programmes might reinforce these tendencies, by stressing farm budgets and marketing, but trends in the rural economy are likely to have a greater bearing on farmer activities.

Governments and donors, however, need to consider carefully how their actions and programmes affect the development of sustainable commercial services in rural areas. In Uganda, private companies argue that the establishment of viable rural farm input networks is undermined by subsidised input programmes in Uganda and neighbouring countries. Such programmes, which are normally donor-funded, are popular with farmers and politicians alike. They are often undertaken as an emergency response – making it still more difficult to build an effective consensus around the need to

minimise this type of action. The input companies, moreover, agree to supply them – thus undermining their own position (though in the absence of co-ordinated action, if they did not do this they would simply see lucrative contracts go to their competitors, without any progress towards the development of commercial networks). Yet, the emphasis accorded to this problem in Uganda suggests that there is a need to review the impact of such actions and develop alternative strategies that offer greater prospects for the development of sustainable supply networks in the medium-term.

Policies to promote smallholder access to purchased inputs in Africa

Building on the conclusions above, policies to promote better access to purchased inputs can be divided into two groups:

- agricultural sector policies
- policies to promote general market development and competition

Agricultural sector policies

1. Avoid agricultural input interventions that undermine the development of sustainable commercial input distribution networks or contribute to poor financial discipline (such as subsidised input schemes and loan amnesties). In dialogue with donors, NGOs and private companies, governments should seek to develop alternative strategies to deal with emergency needs which assure longer term development goals too.
2. Support the development of the farm input sector with appropriate standards and regulation, information and training. Identify appropriate channels for dissemination, exploiting opportunities in the commercial and voluntary sectors, as well as with extension services and farmer groups or CBOs.
3. Promote public/private/NGO/farmer partnerships that improve farmer access to purchased inputs. Identify appropriate roles for government agents (eg in extension partnerships, or the pivotal co-ordinating role played by CDO in Uganda). Build farmer group capacity, as a vehicle for extension, input distribution, crop assembly, and participation in wider consultative processes.
4. Fill research and information gaps on the use of purchased inputs, including combination packages which exploit synergies between farmer-supplied and external inputs.

Policies to promote general market development and competition

1. Undertake market reforms and liberalisation where still necessary, relating to agricultural marketing (inputs and outputs), financial services, and transport – to improve the availability of and competition in rural services.
2. Ensure that the appropriate legislative frameworks and contract enforcement mechanisms exist, and that these are accessible to the groups for which they are intended.

3. Develop rural infrastructure – particularly relating to roads, telecommunications and electrification.

Although these last three policy areas are not specific to input markets, they contribute to the overall context in which the farming sector develops. The four areas identified under agricultural policy, however, provide some clear pointers on government actions to promote access to farm inputs, whilst the earlier analysis provides guidelines on the nature and design of direct interventions likely to succeed. Without exception, the latter depend on constructive dialogue and collaboration between public and private agents.

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Annex 4: text of NRI Development Issues Series publication, in press

Improving smallholder access to purchased inputs in sub-Saharan Africa¹

by Ann Gordon

Why smallholder access to purchased inputs in Africa is important

Smallholder agriculture in much of sub-Saharan Africa is essentially low-input low-output. Since 1970, cereal yields in Africa have stagnated, whilst they have trebled in Asia, and risen by 2.5 times in Latin America. Green revolution technology has not been widely adopted. For instance, for all developing countries, the shares of cropped area devoted to modern varieties are 57% (maize), 70% (wheat), and 74% (rice). Of these three, maize is the crop most relevant to Africa – and only 43% of maize area in sub-Saharan Africa is devoted to modern varieties of maize. (Fritschel *et al.*, 1996). Moreover, many crops which are important in Africa (roots and tubers, cooking bananas, sorghum and millet) are not as important elsewhere, and have therefore received less research. Fertiliser use is also very low. Average use is only 10kg/ha (Larson and Frisvold, 1996). Indian rainfed agriculture has three times the fertiliser applied to African crops. Such aggregate data, moreover, conceal extreme variability in application: five countries account for roughly 2/3 of fertiliser consumption in sub-Saharan Africa. (African Development Bank, 1996).

Increased use of inputs in African agriculture is an important policy issue because:

- most of Africa's population lives in rural areas, and is dependent on agriculture for at least part of its income
- in the past, increases in productivity were achieved through expansion of planted area, but as population pressure increases there is markedly less scope to do this
- few African countries have been able to keep pace with the food needs of growing populations, and food imports are rising steeply
- much of Africa's agricultural production is located in vulnerable low potential areas, and even higher potential lands are now showing signs of environmental degradation
- changes in agricultural markets following structural adjustment have left many farmers with poorer access to purchased inputs.

The focus of this paper is *purchased* inputs – especially improved seed and fertiliser. This is not intended to imply any exclusivity in this strategy to increase productivity – rather that purchased inputs, even in small quantities, can usefully complement other means of intensification. Moreover, the issues affecting access to purchased inputs are somewhat different to those that apply to farmer-supplied inputs. In addition, agricultural markets in Africa, which influence the production strategies adopted by farmers, have been subject to considerable recent change – making re-analysis of these issues an urgent priority.

¹ This publication is an output from a research project funded by the United Kingdom Department for International Development (DFID) for the benefit of developing countries. The views expressed here are not necessarily those of DFID. (R7197 Crop Post-Harvest Research Programme).

Factors which affect input access

Box 1 summarises some of the factors that influence smallholder access to purchased inputs.

Box 1: Factors that influence smallholder access to purchased inputs	
Affordability	<ol style="list-style-type: none">1. price – input is too dear2. transaction costs – supply cost to rural areas and farmer costs in sourcing inputs influence affordability3. unit size – small pack sizes more appropriate and affordable4. credit – can improve affordability5. timing of purchase – farmers can afford inputs better if they are sold when the farmer has income from crop sales6. who makes the purchase within the household – input decision may depend on access to household cash resources
Availability	<ol style="list-style-type: none">1. low purchasing power results in small domestic markets and limit the availability of farm inputs2. even if, eg, fertiliser is available, specific formulae may not be3. products may not be available when needed4. even when available in the capital, weak or absent rural distribution networks constrain farmer access to inputs
Information	<ol style="list-style-type: none">1. basic information on yield response not always there2. extension services stretched3. other sources of information limited and unreliable4. farmers need reliable information on prices5. information on safe use of chemicals also important6. information on how to assess input quality important
Risk and Uncertainty	<ol style="list-style-type: none">1. weather risk2. market risk3. risk that input is unsuitable or of poor quality4. risk that export markets reject chemically treated crops
Commercial context	<ol style="list-style-type: none">1. farmers' expectations of markets and prices2. financial discipline and availability of credit3. critical mass in rural services affects transaction costs4. rural traders offering inputs and information5. farmers market-oriented and treat farming as business

Smallholder input credit programmes

Credit is one way to make inputs more affordable to smallholders. Yet African farmers are extremely poorly served by formal financial institutions. Lending to farmers is considered high cost and risky. The size of individual loans is small, and banks have poor information about farming operations and their potential rural clients. Nor can the informal sector meet this need, because there are insufficient funds to cover the seasonal demand for input loans, when everyone's need arises at the same time.

Cotton grown in tropical zones is normally vulnerable to pest attack, so cotton crops tend to be heavy users of relatively expensive pesticides. NRI recently reviewed cotton input schemes with extremely large coverage – far in excess of numbers served

by conventional financial institutions. Two of the schemes reviewed in Zimbabwe have combined participation of around 60,000 communal farmers – and the tools they use to facilitate and coerce repayment of input loans are almost state-of-the-art best practice (see Box 2), yielding repayment rates of 98%+.

Box 2: Best practice in cotton company lending to smallholders in Zimbabwe

1. Group schemes for peer pressure
2. Group or individual schemes backed up by monitoring/good information, support staff, and ability to act
3. Incentives for repayment and penalties for non-repayment
4. Appropriate incentives for field monitors/co-ordinators
5. Training provided to farmers – extension and business management
6. Developing relationship/trust/loyalty through field presence/contact
7. Accessibility of scheme – minimise red tape and transaction costs; organise so location and timing of contact is convenient to farmers
8. Effective and timely monitoring of input use and crop marketing

In Uganda, a completely different approach involves the 30 or so ginners forming an association, and jointly taking responsibility for an input loan. Seed and chemicals are then distributed “free” to some 300,000 farmers. Ginners make a uniform deduction in prices paid to farmers for their seed cotton, to cover the cost of the inputs, but they still use price to compete amongst themselves for the farmers’ crop. Ginners’ contributions to loan repayment are then calculated on the basis of volumes ginned by the individual companies. The scheme certainly has its problems, not least assuring that the inputs are used on cotton, and are available when needed. Moreover, a less paternalistic scheme in which farmers make their own production technology decisions would no doubt be more efficient – were it possible at the present time. However, it is an imaginative way to boost production rapidly. The ginneries were recently privatised but when individual companies set up their own loan schemes they made massive losses because farmers took out loans but avoided repayment by selling their crop to other ginning companies. Recent experience of loan amnesties and subsidised inputs made it administratively and politically impossible for the companies to enforce the contracts drawn up with participating farmers.

Both types of scheme are interesting because they are undoubtedly commercially-driven. In Zimbabwe, the cotton companies only lend to farmers who achieve a certain level of production. Their objective is to boost production, and to achieve as much increase in output as possible with their resources. So the scheme focuses on the more able and reliable farmers. In Uganda, however, the scheme is very poverty-focused. Cotton is now a low-risk crop, but it is only marginally profitable – and many farmers only grow it because of the benefits to following crops, and the timing of sales, which coincides with Christmas and new school year expenditures. Better-resourced farmers, more willing or able to bear some risk, do not grow cotton.

But credit is not the only way to make inputs more affordable

There are alternatives to credit, however. Cotton companies in Zimbabwe sell cotton inputs for the next season crop when farmers sell this year’s crop. Farmers have the

cash – and the transaction is all the easier, because cotton companies arrange for the input suppliers to make farmgate deliveries. They have also tried to reduce the cost of supplying inputs to rural areas, by making cost reductions in distribution and marketing (eg through bulk purchases, transport sharing arrangements, and farmers' groups taking on more responsibilities).

Input availability is a key constraint

Although agriculture is the most important sector in most African countries, low purchasing power by farmers means that the markets for inputs are still relatively small. Moreover, these markets are dispersed and often in areas poorly served by roads and telecommunications. Thin or absent rural input distribution networks are the consequence – meaning that even those farmers who can afford inputs may not find them available locally. Several development agencies are now experimenting with innovative programmes aimed at promoting the development of commercial input distribution networks, but a critical constraint remains the profitability of selling farm inputs vis a vis other rural retail goods, that can be marketed all year round, and do not depend on credit. Zimbabwean attempts to reduce input distribution costs give implicit consideration to this, at least, because they do not depend on the involvement of normal rural retail outlets.

Information

Increasing smallholder use of purchased inputs also requires improved information. In some countries, critical information on yield response to inputs, on certain crops, grown on different soil types, is simply not available. Elsewhere, the information exists but does not reach farmers – because extension services are over-stretched, and there are few alternative means by which farmers can obtain such information. Farmers need different sorts of information. They need information on the best input to use – but they also need to know how to apply, how to do so safely and what it will cost. Quality assessment is also critical. Where possible, farmers need to know how to assess the quality of inputs without waiting to see how they perform in practice. Seed quality can be particularly problematic – even if guarantees of refunds or replacement are made in the event of non-germination. By the time seed has to be sown a second time, the farmer has already used extra labour (when demands on his/her time are onerous) and the ideal planting date has passed, so there is an opportunity cost in terms of crop income, from this or an alternative crop.

Risk and uncertainty

Farming is inherently risky – because of weather and market factors. Schemes aimed increasing smallholder use of purchased inputs should try to reduce uncertainty, by giving farmers as much information as possible on the appropriate choice and application of inputs. Many schemes that involve the supply of specific inputs effectively reduce market risk faced by the farmer, by providing a market for the end-product (as with the cotton input schemes, or the horticultural outgrower schemes).

Commercial context

The overall commercial context affects farmers' willingness to use inputs and to take out and repay loans. Farmers who are reasonably confident about being able to sell a product at remunerative prices are obviously more likely to use inputs than if they were concerned they might cover their costs. In Uganda, where farmers retreated to a largely subsistence economy during years of civil war, and many areas are still very

poorly served by commercial traders, markedly more progressive agricultural practices are evident in the some of the areas bordering Kenya. In these areas, trading activities have continued unabated for much longer, with Kenya providing inputs and an output market even when markets in Uganda were completely disrupted. Attitudes towards credit can also vary markedly. In Uganda, many credit schemes have run into difficulties because of expectations of input subsidies and loan amnesties, and administrative and political difficulties in enforcing loan repayments. By contrast, supportive legal, political and cultural institutions in Zimbabwe, partly explain the success of the cotton company input schemes there.

Policies to improve smallholder access to purchased inputs in Africa

In addition to policies aimed the general development of rural economies, a number of more specific policy recommendations are made:

1. Avoid agricultural input interventions that undermine the development of sustainable commercial input distribution networks or contribute to poor financial discipline (such as subsidised input schemes and loan amnesties).
2. Support the development of the farm input sector with appropriate standards and regulation, information and training. Identify appropriate channels for dissemination, exploiting opportunities in the commercial and voluntary sectors, as well as with extension services and farmer groups or CBOs.
3. Promote public/private/NGO/farmer partnerships that improve farmer access to purchased inputs. Identify appropriate roles for government agents (eg in extension partnerships, or the pivotal co-ordinating role played by Cotton Development Organisation in Uganda, which supported the ginners in their bid to associate, access funds and distribute inputs). Build farmer group capacity, as a vehicle for extension, input distribution, crop assembly, and participation in wider consultative processes.
4. Fill research and information gaps on the use of purchased inputs, including combination packages which exploit synergies between farmer-supplied and external inputs.

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Annex 5: example of wider-audience article for eg., Spore or ZFU publication

Farmer credit schemes run by the private sector in sub-Saharan Africa¹

Ann Gordon, Natural Resources Institute

Economic liberalisation has left many farmers in Africa with worse access to purchased inputs. Governments no longer subsidise inputs, loss-making loan schemes have been closed, crop purchase monopolies (which made it easier to collect repayment from farmers) are largely a thing of the past, and widespread devaluation means that imported inputs now seem much dearer, when expressed in local currencies.

Much hope was pinned on the emergence of a dynamic private sector in the wake of market reforms. In fact, commercial activity has been highly selective and often disappointing. Many farmers find their access to markets and services worse than it was before the reforms. Recent research by NRI highlights some encouraging and surprising developments, however. For instance, in Uganda and Zimbabwe private cotton companies are the most important source of formal sector credit in the smallholder sector. In Uganda, an estimated 300,000 farmers benefit, whilst around 60,000 communal farmers participate in the Zimbabwean schemes. The schemes operate along entirely different lines – but both models point a way forward in otherwise difficult circumstances.

First, Zimbabwe, where the schemes could aptly be described as state-of-the-art in lending to smallholders. Before liberalisation there was just one cotton parastatal. It operated a loan programme – and was easily able to collect on these loans when farmers sold their crop. After liberalisation, however, repayment rates fell, as farmers avoided repayment by selling their crop to one of the other two companies. Steps were taken to tighten up the scheme, and one of the other companies started its own scheme, operating along very similar lines. The companies now achieve repayment rates in excess of 98%, using a variety of measures:

- All borrowers belong to groups of cotton smallholders. Default by one member of the group brings retribution to the whole group, which may be subsequently excluded from the scheme. This increases incentives to repay.
- Groups performing well receive cash rewards.
- If defaulting occurs, the companies act swiftly and come down heavily on defaulters, seizing assets when necessary.
- Local agents of the cotton companies are in year-round contact with smallholders, building closer relationships and a sense of loyalty to the company.
- Additional services are provided in addition to the input credit. Extension advice may be provided, and the Cotton Company has recently introduced cash loans. Again, these additional benefits of “belonging” to a company help to strengthen relationships and loyalty.

¹ This publication is an output from a research project funded by the United Kingdom Department for International Development (DFID) for the benefit of developing countries. The views expressed here are not necessarily those of DFID. R7197 Crop Post-Harvest Research Programme.

The scheme is run along strict commercial lines. Farmers have to achieve a certain threshold yield before they may participate (so it effectively focuses on the more able farmers) – and the companies have resisted the temptation to expand the scheme to cover a larger group of less productive farmers.

In Uganda, the scheme seems clumsy and inefficient by comparison. The sector has recently been privatised – and farmers were initially reluctant to grow cotton, having bitter memories of the former voucher system, where low state-controlled payments were often late or not honoured at all. Some of the larger ginning companies tried to run schemes like the Zimbabwean model, but soon found that they were losing massive amounts, with farmers simply selling their crop to other ginners to avoid repayment of loans. Moreover, in Uganda it proved logistically and politically impossible to enforce loan/crop purchase contracts – and there was no support for ginners trying to seize farmers' assets in compensation for unpaid debts.

So the ginners (there are about 30 in Uganda) jointly took out a loan to pay for inputs, which were then distributed “free” to farmers. Individual contributions to repayment of the loan are based on the volume of cotton ginned by each ginners. Farmers receive less for their cotton, to take account of the cost of inputs – but the ginners still compete on price for the farmers' crop. Farmers cannot avoid paying for the inputs – because all the ginners participate in the scheme. There are lots of problems with the scheme – not least making sure that the farmers receive inputs free of charge, when needed, and that the inputs are used on the cotton crop. Also, the more efficient farmers are effectively penalised: they actually pay more for their inputs (because they sell more cotton) whilst the less efficient farmers pay less for their inputs. Clearly, in the long run it will be important to shift to more efficient sustainable input credit mechanisms - but in the short-run, as a pragmatic stop-gap measure to rapidly increase cotton output, it has much to commend it.

Both schemes have much wider application. The Zimbabwean scheme could be applied to a variety of crops. It depends on strict application of a package of “best practice” measures and a supportive institutional framework for contract enforcement. The Ugandan scheme, notwithstanding its problems, still points a way forward where financial discipline amongst farmers and the conditions for contract enforcement are weak. However, the scope for buyers to form a fairly “watertight” association may be limited to crops with fairly specific marketing options, such as certain export crops, or crops that need processing like fibres or oilseeds. Also, both models depend on private sector preparedness to provide credit – which is only likely to arise when they face some sort of supply constraint.

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Annex 6

Credit provision for small-holder farmers: lessons from Uganda and Zimbabwe¹

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Introduction.

The agricultural supply response to market liberalisation in Africa has been extremely variable, but often disappointing – particularly for food crops. For some crops and regions, it seems that policy-makers over-estimated commercial willingness to become involved in the marketing of small-holder production. Perceived risk, poor information and high transaction costs have contributed to an often weak commercial presence in the more marginal or remote areas. Yet the parastatals that formerly provided output and input marketing services, sometimes with a credit component, have been largely dismantled. This leaves a critical gap in the provision of agricultural marketing and associated rural services.

Smallholder access to agricultural services (financial services, inputs, extension, output marketing) is recognised as a critical factor in achieving productivity gains. State withdrawal puts the onus on the commercial sector to provide these services – and there is particular interest in partnership approaches which build on the competences of commercial, non-governmental and public players.

NRI has been conducting preliminary research on the conditions necessary for private provision of credit to small-holders. The initial research has focused on differing experiences from the cotton sectors in Uganda and Zimbabwe – where private cotton companies are involved in small-holder credit programmes – with a view to identifying other sectors or situations where these models could be applied.

Uganda and Zimbabwe have both recently been through periods of market liberalisation. Private companies in the cotton sectors of both countries have taken initiatives to provide agricultural services to cotton smallholders. The approaches taken in each country are markedly different, despite similarities in the problems faced. However, in both cases there are considerable grounds for optimism, with smallholder cotton production increasing, in part because of the credit schemes. These input credit schemes involve the provision of production inputs on credit to farmers by companies, which recover the loans by having exclusive purchase rights to the produce of those farmers. The schemes in both countries are still in their infancy, and questions remain over their sustainability, though they provide many lessons for the successful operation of input credit schemes in cotton and other sub-sectors.

Cotton sector development in Uganda and Zimbabwe

There are some parallels between the development of the cotton sub-sectors in Uganda and Zimbabwe, but also differences that help to explain the characteristics of the input credit schemes.

Similarities:

- Both Uganda and Zimbabwe have a long history of cotton production.
- Both countries have recently liberalised their cotton sectors. Prior to 1994, state parastatals held monopolies on the marketing of seed cotton. Market liberalisation has resulted in competitive purchasing markets.
- The market and state reforms have led to changes in local availability of inputs (seed, fertilisers and pesticides) for small-holders
- The small-holder sectors of both economies are poorly served by financial institutions (commercial banking sector, non-governmental organisations, parastatals), and there is little access to credit for small-holder crop production.

- The cotton sectors of both countries have received considerable support in recent years to regenerate the industries. In Zimbabwe, severe drought in 1992 had disastrous consequences for the whole agricultural sector. In Uganda, years of low state-controlled prices and voucher payments had dramatically reduced output and smallholder interest in growing the crop. In both cases, World Bank funds have been allocated to the cotton sector to aid recovery.

Differences:

- The structure of the agricultural sectors is different in the two countries. Zimbabwe has a significant large-scale commercial farming sector, accounting for about 1/3 of national cotton production in 1998.
- The agricultural sector in Zimbabwe is more developed than in Uganda, with good infrastructure, a well developed agro-processing sector, and relatively high input usage. However, some of these services are geared towards the large-scale commercial sector, which has far higher productivity than the smallholder sector.
- Uganda has a large number of cotton ginners (over 30), ranging from small operations with a single ginnery, to larger international companies with networks of modern ginneries. In Zimbabwe there are only three ginning companies, and the sector is dominated by the privatised Cotton Company of Zimbabwe. Given that Zimbabwe's production is also much higher than Uganda's, the structure of the ginning sector is considerably more concentrated in Zimbabwe.
- In Zimbabwe, small-holder cotton production increased in importance throughout the 80s, whereas recovery has begun in the mid-90s in Uganda.
- Zimbabwe is a significantly higher income country than Uganda, and commercial services are more developed in almost all sectors.

Different approaches to input credit

In both countries private companies have developed input credit schemes. The incentives to operate input credit schemes are similar in both countries: all companies are dependent to some extent on seed cotton from smallholders to maintain ginnery utilisation rates; excess capacity in the ginning sector gives companies an added reason to seek ways to secure access to smallholder seed cotton; and, the general paucity of production services for smallholders threatens seed cotton production.

The input credit schemes have evolved differently, so that for the 1998/1999 season the schemes in the two countries have significantly contrasting approaches. The universal problem with input credit schemes is defaulting farmers, especially those who intentionally sell to an alternative buyer to escape repayment of their loan (known as 'side-marketing').

Uganda:

The withdrawal of the state from the distribution of cottonseed for planting was recognised by ginners as seriously jeopardising seed cotton production, and therefore threatening the ginning sector. The initial reaction of one of the larger ginneries was to launch an ill-fated input credit scheme. The scheme proved disastrous as the majority of smallholders defaulted on their loans, due to a combination of side marketing and a poor harvest (on account of El Nino-related weather effects). Farmers disregarded the agreement they had entered into with the cotton company and sold to other ginners offering higher prices. The cotton company making the loans

found it impossible to enforce the purchase agreements, and attempts to seize assets proved unworkable.

In order to remove the possibility of side-marketing, the Uganda Ginners and Exporters Association (UGEA) has been formed, with compulsory membership of all cotton ginners. For the 1998/1999 season the UGEA has financed the input credit scheme from a Bank of Uganda loan. In developing and operating the input credit scheme, a critical role has been played by the Cotton Development Organisation (CDO), a parastatal formed when the sector was liberalised, to provide co-ordination and regulatory services. The CDO has coordinated the distribution of cottonseed and pesticides. Smallholders are free to sell their seed cotton to any ginner. The ginners are responsible for loan repayment, and these costs are met through a levy payable against volumes of cotton ginned by each ginner. (Volumes are assessed by independent monitors assigned to each ginnery). Average (not individual) input costs will be factored into the price paid to farmers. The problem of side-marketing has therefore been overcome by removing the option of selling to alternative buyers: all ginners are members of the UGEA so it is impossible for a farmer taking credit to sell to buyers outside of the scheme. Levy avoidance by individual ginners has been reduced by the presence of monitors, and dialogue with border officials and spinning factories, where ginners may try to make illegal sales.

Zimbabwe:

Unlike Uganda, there has been no cooperation between the three ginning companies in Zimbabwe. Out of the three companies, two operate input credit schemes (the Cotton Company of Zimbabwe (Cottco), and Cotpro). Both companies have a similar approach for overcoming the problem of side-marketing:

- All borrowers belong to groups of cotton smallholders. Default by one member of the group brings retribution to the whole group, which may be subsequently excluded from the scheme. This increases incentives to repay.
- Groups performing well receive cash rewards.
- If defaulting occurs, the companies act swiftly and come down heavily on defaulters, seizing assets when necessary.
- Local agents of the cotton companies are in year-round contact with smallholders, building closer relationships and a sense of loyalty to the company.
- Additional services are provided in addition to the input credit. Extension advice may be provided, and the Cotton Company has recently introduced cash loans. Again, these additional benefits of 'belonging' to a company help to strengthen relationships and loyalty.

Judging performance of input credit schemes

Schemes in both countries are still in their infancy. In Uganda, the performance of the UGEA scheme cannot be fully judged because it has only been running for one season.

Judgement criteria	Countries	
	Zimbabwe	Uganda
Repayment	Cottco: 1997/1998 season repayment rate: 98% Cotpro: 1997/1998 season repayment rate: 100%	Only 50% of input loan repaid (see footnote)
Coverage	For 1998/1999 season: Cottco: 48,000 smallholders Cotpro: 5,000 smallholders This represents about 25% of smallholder cotton farmers – generally farming on communal or resettled land (small plots, unirrigated, and typically on marginal land).	For 1998/1999 season. Cottonseed distributed to around 300,000 smallholder farmers, typically farming on small unirrigated plots. The scheme is intended to reach all cotton farmers (except those enrolled in a separate organic scheme)
Efficient use of inputs	Although no data are available, inputs are likely to be used efficiently. <ul style="list-style-type: none"> • Input use is closely monitored and extension advice is provided. • Farmers pay for inputs so have good reason to use them wisely • Inputs are supplied at cost price (cheaper than local market prices due to bulk buying by cotton companies and no retail margin). 	Again, no data are available. However, inputs are free at the point of delivery to farmers, with the cost deducted uniformly from farmgate prices – regardless of the volume of inputs supplied to individual farmers. This weakens the incentive to use inputs efficiently. To combat this, monitoring and extension advice is provided – but reports of diversion of inputs and late delivery were widespread.
Subsidies	Cottco: funds for the input credit scheme have come from the World Bank at below market interest rates. Cotpro: partly reliant on low interest Agric Finance Corporation loans	UGEA uses donor funds loaned at below market interest rates – and the loan is guaranteed by the Govt. CDO do not charge for the logistics support provided (Govt donor funds used for this) UGEA's inability to repay loan amounts to 50% subsidy ¹
Contribution to cotton sector development	Small-holder credit contributes to increased production – but significant numbers of producers do not use it	Production credit almost certainly a critical component in cotton sector recovery. UGEA plan to continue scheme with commercial loan and insurance cover.
Wider development impacts	Potential to expand financial services available to cotton farmers (eg savings schemes) – with wider development impacts Group approach helps build community-level capacities	Whilst cotton production may increase farmer incomes, the present input scheme does not contribute to wider farmer benefits relating to eg., group capacity- building and financial discipline

¹ Repayments were calculated on a per kg of seed cotton ginned basis, and assumed an improbably large harvest of 150,000 bales. The use of this figure (rather than a more realistic estimate) made the scheme more attractive to ginners, and politically easier to sell to farmers (to the extent that they had any voice in this). In the event a harvest of only half this amount was achieved, with the Government guarantee effectively providing a 50% subsidy on the loan taken out by ginners (ie meeting half the repayment costs - both interest and principle).

Why have the schemes evolved differently?

In Uganda the ginners decided that co-operation was needed to overcome the problem of side-marketing. Credit schemes implemented prior to this co-operation met with spectacular failure. In Zimbabwe, co-operation between the cotton companies has not proved essential. (With a small number of large companies it seems that individual companies feel they have more to lose than gain from co-operation). Instead, a set of other mechanisms has been developed for the successful operation of the schemes.

The development of the credit schemes has been affected by various factors:

- The Cottco scheme in Zimbabwe started prior to liberalisation, when the parastatal (Cottco's predecessor) still operated a crop purchase monopoly. Farmers participated in the scheme for two years before liberalisation, and this may have contributed to the successful continuation of the scheme when new companies entered the market. (There were initial problems with default immediately after liberalisation, but Cottco moved quickly to tighten up procedures).
- Financial discipline appears to be stronger in rural Zimbabwe, with farmers increasingly recognising the obligation to repay loans. Asset seizure in Zimbabwe has the desired effect of forcing people to repay, whilst in Uganda it has caused outrage and soured relationships between ginners and farmers. In Uganda, there has perhaps been more recent experience and expectation of loan amnesties, and weak follow-up by NGOs and state lenders (whose credit programmes ran at a loss). In addition, it was politically difficult to enforce loan repayment given that the poor harvest was largely attributable to extreme weather conditions.
- The use of groups in Zimbabwe has been beneficial to the input credit schemes. In Uganda there appears to be general scepticism towards groups, possibly due to bad experiences in the past. The capacity to run and facilitate such groups is almost certainly weaker in Uganda at the present time.
- The Zimbabwe schemes involve many incentives for good performance. Perhaps the greatest incentive is the opportunity to remain in the input credit schemes, which implies that they recognise the benefit of access to inputs. In Uganda, farmers rarely use fertilisers, and even pesticide use in cotton cultivation is not universal. They may perceive less benefit from participation in input credit schemes – hence the ginners' stop-gap measure of (effectively) compulsory participation (ie input charges are factored into seed cotton prices, regardless of participation).

Co-operation between ginners in Uganda may be possible because of the fairly level playing field they face. In Zimbabwe, Cottco effectively has a head start over the other ginners – and stands to gain little from sharing information with the others (though, of course, the latecomers would benefit from the information Cottco has on the credit and production records of individual farmers).

Moreover the UGEA mechanism in Uganda may be appropriate there because it is less demanding of skills and experience in providing services to small-holders. A group approach, for instance, would call for rapid learning on the part of the ginning companies, and co-operation with the stretched public and NGO services available in rural areas to facilitate and train groups. The relatively recent history of loan amnesties and opportunities for strategic default (intentional default, unlikely to jeopardise future income or access to services) would almost certainly exacerbate loan

repayment. The UGEA mechanism could therefore be viewed as an imperfect pragmatic response to an immediate need to provide inputs to farmers, without which there would be little cotton production, and the newly rehabilitated ginneries would be uneconomic. Whether it proves effective in this will depend on the ability of CDO and the ginners to reduce input leakage and diversion to acceptable levels, and to make timely deliveries of appropriate inputs (such that the benefits seen in cotton production do indeed exceed the costs of the scheme).

Although co-operation can be used to combat side-marketing, it also has some drawbacks. Cooperation dampens incentives for the individual ginners to provide additional services to farmers, for instance extension advice, as farmers have no commitment to sell to a specific ginner. However, it may be possible for the ginners to provide cotton extension services collectively – and in so doing, realise certain economies of scale too. However, ginners do stand to benefit from creating close relationships with growers, and although there is no evidence of it yet, theoretically ginners could compete on additional service provision as well as on price.

Lessons from these experiences

There has been a steady increase in smallholder seed cotton production in Zimbabwe during the period the schemes have been operating. The data from Uganda is more difficult to interpret. The 1998/99 harvest (approximately 80,000 bales of cotton lint) exceeded the previous El Nino harvest (32,000 bales), but did not reach the levels achieved in 1996/97 (110,000 bales). The scheme has reached large numbers of farmers in Uganda – but there were complaints of late delivery, and diversion of inputs to other uses, markets and farmers. Interestingly, however, the ginners have put their faith (and money) in the scheme, which they plan to continue in 1999/2000 at higher cost with commercial loans. In Zimbabwe, the Cotton Company is the largest provider of credit to smallholders - far larger than the parastatal Agricultural Finance Corporation.

It is useful to summarise the conditions that are conducive to the development of input credit schemes in which repayment is linked to output marketing.

Incentives

Companies providing credit will recognise the risks and costs involved. These will vary depending on the production and market conditions pertaining to individual crops, and other factors relating to company presence in rural areas, the development of other rural services and capacities, and farmer experience of other credit schemes. Companies will have an incentive to provide credit if the benefits outweigh the costs. Examples may include situations where:

- the trade is particularly profitable, making it worthwhile to assure supply sources and bear some risk (high value horticultural exports, for instance)
- there is a need to assure supplies to maintain plant utilisation at economic levels (cotton ginneries, for example)
- more assured supplies will help reduce other risks or costs faced by the buyer (by increasing market share, for instance)
- farmers have no other means by which to produce the desired crop

Farmers participating in such schemes risk indebtedness or asset seizure, and will be locked into sales agreements. Their willingness to participate will be partly dependent on:

- a clear understanding of the potential benefits of participation
- the desirability of securing market access
- inability to acquire necessary inputs from other sources or by other means
- the package of benefits on offer (for instance, inputs, transport, extension)
- the terms on which production credit is offered (input and output prices, and interest rate)
- the associated transaction costs (for instance, time spent travelling or in meetings, filling out forms) and skills required (eg., book-keeping)

Unfortunately farmers may also be willing to participate if they perceive potential for strategic default. The onus is on the provider to anticipate situations in which this might arise (for instance, where a crop can be consumed on-farm or marketed locally), to put the necessary mechanisms in place to avoid it (see below), and to make sure that farmers are aware that strategic default will not be possible.

Means

Companies operating input credit schemes need access to funds to finance the schemes. Operation of large-scale input credit schemes requires a considerable outlay over several months or a year (or even longer with perennial crops or livestock). Commercial banking sectors in both Uganda and Zimbabwe are reluctant to provide financing for small-holder agricultural activity (though there are some promising pilot projects developing more robust methodologies for lending to small-holders). In the cotton sectors in both countries, use has been made of international donor funds, but this avenue may not be available to smaller private companies (unless they co-operate, as has happened in Uganda). Larger companies may be able to use their own funds.

Mechanisms

The experience in cotton demonstrates the variety of mechanisms that may be used to operate and strengthen input credit schemes which link repayment to crop purchase:

- co-operation between buyers
- group lending
- close monitoring
- extension services
- developing good company-farmer relations
- offering incentives for repayment
- strict treatment of defaulters (asset seizure, legal action, group penalties)
- lending “in-kind” to reduce diversion of inputs to other uses
- policing potential “leakages” (crops being sold across borders for instance, or inputs being sold in local markets)

The appropriate mix of mechanisms depends on the characteristics of the commodity sub-sector (for instance, the alternative outlets or uses for the output), the level of financial discipline of small-holders, and the presence of supporting institutions (such

as a central co-ordinating authority, extension services, and experienced facilitators of farmer groups).

Clearly applications to other sectors and country situations would require careful appraisal, but the experiences in the cotton sectors in Zimbabwe and Uganda provide some very useful pointers on enabling conditions and approaches appropriate to particular circumstances.