FOOD SECURITY RESEARCH PROJECT
ZAMBIA NATIONAL FARMERS UNION

POTENTIAL IMPACT OF THE KWACHA APPRECIATION AND PROPOSED TAX PROVISIONS OF THE 2006 BUDGET ACT ON ZAMBIAN AGRICULTURE

By

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ACKNOWLEDGMENTS

INSTITUTIONAL PROFILES

The Zambia National Farmers' Union (ZNFU) is a private, non-political association representing its 33,000 small scale and 510 large scale members. The mission of the ZNFU is to promote and protect the interest of members as farmers, individuals, corporations and other organizations involved in the business of farming in order to achieve sustainable economic and social development. The ZNFU conducts consultations and fact finding efforts through its network of regional offices and through its seven commodity committees and thirteen specialized associations. The Research and Development Department at the ZNFU Secretariat is staffed by two economists, John Fynn and Ellah Chembe.

The Food Security Research Project (FSRP) is a collaborative program of research, outreach and local capacity building, between the Agricultural Consultative Forum (AFC), the Ministry of Agriculture and Cooperatives (MACO), and Michigan State University's Department of Agricultural Economics (MSU). The Zambia FSRP field research team is comprised of Jones Govereh, Steven Haggblade, Anthony Mwanaumo, Ballard Zulu, Misheck Nyembe, and Stephen Kabwe. MSU-based researchers in the Food Security Research Project include Antony Chapoto, Cynthia Donovan, Thomas Jayne, Nicole Mason, David Tschirley, Michael Weber, and Zhiying Xu.

EXECUTIVE SUMMARY

The Stakes
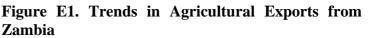
Agriculture employs 70% of the Zambian workforce and an equal number of the country's poor (Table E1). For this reason, Zambia's Poverty Reduction Strategy Paper focuses on the key role a prosperous agricultural sector must play in broad-based economic growth and poverty reduction. Even the urban poor, who spend over two-thirds of their income on basic staples, depend on growing agricultural productivity to maintain low food prices, which in turn largely govern their real income. Given agriculture's importance to the welfare of both the rural and urban poor, it is difficult to see how Zambia can achieve broad-based poverty reduction without significant growth in agricultural output and productivity. Zambia is not unique in this respect. "Since 1700, virtually all instances worldwide of mass dollar poverty reduction began with a sharp rise in labour income due to higher productivity on small family farms." (Lipton 2005).
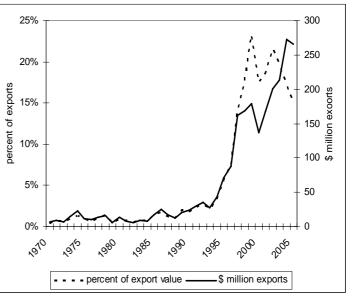
As a foreign exchange earner, agriculture has proven the most dynamic component of Zambia's export economy over the past decade and a half, since economic liberalisation began. In the 1960's and 1970's, agriculture accounted for less than 5% of total exports, while in the early years of the 21st century that share has risen to between 15% and 25% (Figure E1). Agricultural exports such as cotton, flowers, horticultural products and tobacco have formed the core of Zambia's successful diversification away from dependence on volatile mineral exports (Figure E2). In value terms, these agricultural exports amounted to $277 million in 2005, and they provided employment to 320,000 smallholders as well as 143,000 commercial farm workers.

Table E1. Scale of Zambia's Agricultural Sector

	2000 - 2005
Agricultural GDP	
million 1995 USD	594
as percent of total GDP	17%
Exports	
value (million USD)	214
as share of total	20%
Employment	
millions	2
as share of total	71%
Poverty (% of poor population)	
agricultural households	70%
nonfarm households	30%
total	100%

Sources: World Bank (2002), Zambia 2000 Census, CSO (2004).

Figure E1. Trends in Agricultural Exports from Zambia

Table E2. Projected Impact of a Kwacha Appreciation from 4,500 to 3,500 per USD on Zambian Agriculture

	Current Scale		Anticipated Reduction	
	Production ($ millions)	Employment (thousands)	Net Exports* ($ millions)	Employment (thousands)
Export Crops	$277	463	$106	190
Domestic staples	$281	511	$75	30
Total	$557	975	$181	220

* For domestic crops, a Kwacha appreciation will increase imports.

Impact of the Kwacha Strengthening

The rapid recent appreciation of the Kwacha has placed these gains at risk. The sudden strengthening of the Kwacha since November 2005 has reduced the Kwacha value of agricultural exports by 30%, forcing reductions in farmgate prices and eroding exporter profit margins. As in a classic case of Dutch Disease, large inflows of foreign exchange – whether from surging international copper prices, foreign aid or speculative financial inflows – have contributed to the strengthening Kwacha. The subsequent rapid appreciation of the Kwacha risks making much of Zambia's export agriculture uncompetitive on world markets. The largest agricultural export employers – cotton, tobacco and horticulture – will experience the steepest reductions in farmer incentives, production and export volumes. Floriculture, because of its low domestic cost component, will face less pressure from a strong Kwacha, although recent increases in petroleum prices over the past several years have placed export margins under pressure.

Under a permanent strengthening of the Kwacha at 3,500 K/$, our projections suggest that agricultural export earnings will fall by roughly $106 million per year, affecting 190,000 farm households (Table E2). For the farms that remain, largely those who are most efficient and also debt-free, competitive pressures will favour increased mechanization using cheap imported equipment at the expense of local labour. Thus, even the farms that survive will face strong pressure to reduce employment. At a 2,500 exchange rate, our budget estimates suggest that export agriculture will largely disappear from Zambia.

Though export agriculture will bear the brunt of the Kwacha appreciation, domestic food production may also be affected. Over the past decade and a half, as maize production has trended downwards, imports have become more competitive and Zambia has tended to import with increasing frequency. Looking forward, a permanent strengthening of the Kwacha will make imported maize, wheat, wheat flour, dairy products and poultry even more competitive with domestic production. During the past six years, under a hypothetical 30% appreciation in the Kwacha, import prices of maize would have fallen below domestic lean season prices for roughly four months at a stretch, compared to one month, on average, in the past (Figure E3). This suggests significantly larger maize imports – on the order of 200,000 tons per year – coupled with corresponding downward pressure on maize prices and farmer production incentives. The foreign exchange cost of this shift would be in the range of $40 million to $60 million per annum and would imply a reduction in domestic production of about 20% with associated loss of income earning opportunities for rural communities.
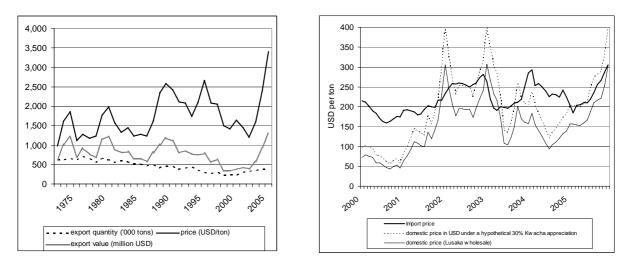
Figure E2. Trends in Zambian Copper Exports

Figure E3. Trends in Import and Domestic Prices of White Maize

Transition Year Pressures

During the current 2005/06 crop year, the timing of the abrupt Kwacha appreciation – after farmers had purchased inputs, begun field preparations and planting – has placed even greater even greater pressure on farm profits. Most farmers have purchased imported inputs at a 4,500 exchange rate or above, raising their Kwacha input costs, while they will export at a 3,500 exchange rate or below, suffering a 20% to 30% fall in Kwacha revenues.

Countering this financial pressure, however, is the bumper harvest anticipated this season due to abundant, well-spaced rainfall. Smallholder cotton, maize and tobacco farmers can expect to see yields anywhere from 15% to 25% higher than normal. This output windfall will serve to moderate temporarily the fall in Kwacha output prices. In the current transition year, smallholder cotton producers will likely see returns fall only slightly, by between 5 and 10%, rather than the full 25% fall that would occur with a strong Kwacha in a normal rainfall year (Table E3). While favourable weather will cushion farmers during the 2005/6 season, reversion to normal yield levels in coming seasons will likely result in large-scale small farmer exit from export agriculture (Table E2).

Effects of the Original 2006 Budget Proposals

The initial revenue proposals submitted with the 2006 budget place still further pressure on farm profits. Though these measures have been subsequently modified, the original budget revenue proposals would have affected Zambia's 300,000 smallholder outgrowers significantly. Unable to meet the K200 million ZRA threshold for VAT registration, the proposed standard VAT rating for agricultural products would raise their purchased input costs by 17.5%, disadvantaging them compared to large farmers who would remain able to deduct the VAT paid on inputs.

Still more onerous is the proposed turnover tax withholding provision. Under this provision, unregistered smallholders would face a 45% withholding on their revenues. On top of a 30% exchange rate reduction in Kwacha earnings, this would amount to a 75% reduction in output.

Table E3. Exchange Rate and Tax Implications for Smallholder Cotton Farmers

	Returns to labor (K/day)
Exchange rate impacts	
a) K 4500 per dollar	6,488
b) K 3500 per dollar	4,824
c) K 2500 per dollar	3,161
Tax Changes (at 3,500 exchange rate)	
d) VAT on inputs	4,514
e) 3% turnover tax, exporter pays	4,316
f) 3% turnover tax, farmer pays	2,577
g) Witholding tax	1,545
Transition Year Yield Effects (at 3,500 exchange rate)	
h) 600 kg/ha	2,953
i) 800 kg/ha	4,603
j) 1000 kg/ha	6,252

Source: Table 4

price received at harvest time. Under this scenario the largest group of the small-scale export producers, the smallholder cotton farmers, would see returns fall to roughly K1,500 per day (Table E3). Those smallholders who live in close proximity to a ZRA office and are able to register will be required instead to pay a 3% turnover tax. If exporters or buyers are permitted to deduct and remit the 3% to ZRA on behalf of the small holders, the impact of the 3% tax will be marginal. However, under individual filing, the transaction costs of this payment would amount to roughly 40% of the average cotton farmer's current profit, reducing returns to K2,600 per day and precipitating large-scale exit from smallholder cotton farming

Both the VAT and withholding tax provisions initially proposed in the 2006 budget would tend to discourage formal marketing of agricultural produce and drive producers instead to informal markets, where neither tax is imposed. Many animal health experts fear that this diversion from formal markets, with their health and sanitation controls, could have serious repercussions for the control of livestock and poultry diseases.

Policy Implications

The cause of Zambia's rapid Kwacha appreciation remains the subject of vigorous public debate. Observers typically point to one of three possible explanations: surging copper export earnings, a foreign exchange windfall precipitated by the HIPC completion, and large inflows of portfolio investment in local treasury bills.

Whatever the cause of the Kwacha appreciation, the consequences appear serious for agricultural exporters. Results from this study suggest that the current boom in foreign exchange inflows risks crippling the engines of Zambia's highly successful agricultural export diversification. The negative impact on the tourism industry, though not studied here, may prove equally severe. Once copper prices return to normal and foreign aid and speculative financial inflows recede, Zambia appears likely to revert to a copper-dependent

export economy, without an alternative foreign exchange earner. As in the classic case of Dutch Disease, the current foreign exchange windfall risks doing long-term structural damage to agriculture.

Governments who have successfully managed similar foreign exchange windfalls to the advantage of their agricultural producers have used the windfall earnings to promote, rather than impede, economic diversification. Their main tools have been active management to avoid excessive exchange rate volatility, sterilization of foreign exchange earnings to avoid currency appreciation, strict controls on government spending in order to combat inflation, and significant public investment in agricultural technology and infrastructure. To date, the Zambian government has adopted none of these measures.

Clearly, government macro economic and fiscal policies affect all sectors of the economy, not just agriculture. So any policy response will require careful consideration of the potential implications for the service and manufacturing sectors as well. This study, which has focused solely on agriculture, suggests that under the current exchange rate level and policy environment, Zambia risks losing roughly one-third of its agricultural export base over the medium run, thereby seriously undermining current economic diversification and poverty reduction efforts.

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ACRONYMS

BOZ	Bank of Zambia
CSO	Central Statistical Office
FDI	Foreign Direct Investment
FSRP	Food Security Research Project
GDP	Gross Domestic Product
GRZ	Government of Zambia
HIPC	Highly Indebted Poor Countries
IMF	International Monetary Fund
NTB	Non-tariff barrier
NTEs	The Non-Traditional Exports
PRSP	Poverty Reduction Strategy Paper
TAZ	Tobacco Association of Zambia
TPIN	Tax Personal Identification Number
VAT	Value added tax
ZCGA	Zambia Coffee Growers' Association
ZEGA	Zambia Export Growers' Association
ZESCO	Zambia Electrical Supply Company
ZNFU	Zambia National Farmers' Union
ZNFU/FSRP	Zambia National Farmers' Union/Food Security Research Project
ZRA	Zambia Revenue Authority

1. INTRODUCTION

1.1. Background

The final quarter of 2005 witnessed a rapid appreciation of the Kwacha by 30% as a result of the combined effects of attainment of Highly Indebted Poor Countries (HIPC) completion point and consequent debt relief, a boom in copper exports, successes in non-traditional exports, seasonal inflows of donor aid, delays in maize and fuel importation, and, to some extent, speculation on the currency. The potentially negative impact on the non-traditional export sector was immediately brought to the attention of the Ministry of Finance and the Bank of Zambia at various meetings by Zambia National Farmers' Union (ZNFU). The issue has been extensively discussed in the media and at the Economics Association. Government's official response was that the appreciation was due to normal market forces of supply and demand for currencies, which reflected strong economic fundamentals. Hence, they consider strengthening of the Kwacha a source of pride. Some observers suggested that the anticipated fall in input costs would mitigate the impact on exports to a degree that would retain profitability. However, other groups expected that the prospective reduction in input prices would only partially mitigate the fall in income due to appreciation.

Given these diverging views, a further meeting of major exporters in the agricultural sector was convened by ZNFU on 12th January, 2006, at which it was resolved that ZNFU should examine the issue in a study that would quantify the potential impact on both agricultural exports and domestic production with a view to revealing the likely effects on competitiveness, commercial viability, loan repayments, foreign exchange earnings, employment, rural income-earning opportunities and foreign direct investment. Draft Terms of Reference for such a study were discussed and it was resolved that the study should be conducted by the Research and Development Department of ZNFU with, in the interests of impartiality, assistance from other appropriate institutions. The TOR were modified (Annex I) in response to suggestions by stakeholders and the Food Security Research Project (FSRP) was approached to assist in the study.

Simultaneously, a separate but related study is being conducted by the Bank of Zambia (BOZ). During early discussions with the ZNFU, the BOZ indicated they would conduct a parallel study examining the general equilibrium implications of the Kwacha appreciation. In addition to agriculture, the BOZ study aims to explore potential impacts on other sectors of the economy, including services and manufacturing.

Since the Zambia National Farmers' Union/Food Security Research Project (ZNFU/FSRP) study was initiated, the agricultural sector has been confronted by a series of new revenue proposals: the imposition of a value added tax (VAT) on agricultural supplies, standard VAT rating on sales of all agricultural products except maize, and introduction of a 45% withholding tax on agricultural sales by unregistered (mainly smallholder) farmers. Though many of these proposals have been modified during the budget debates, the overall budget package remains under discussion in parliament. The initial revenue proposals in the 2006 budget have wide ramifications for the agricultural sector. While it is not intended that they are all comprehensively analysed in this study, the profitability and prospects for agriculture cannot be viewed in isolation from the changes to the new tax measures introduced in the 2006

budget. Therefore the study has been extended to show the impact of the revenue proposals as well as the Kwacha appreciation on key domestic and export agricultural undertakings.[1]

1.2.   Objective of the Study

The study, first of all, aims to quantify the impact of the Kwacha appreciation and to project the broad impact on the agricultural export, domestic production and processing sectors. Secondly, it explores the scope for mitigating actions – by farmers, commercial enterprises and government authorities – that might provide a means of survival of export operations and the retention of income-earning opportunities by rural communities in the commercial and small scale agricultural sectors. Finally, the study aims to assess the impact of the Kwacha appreciation on the viability of agricultural enterprises and income earning opportunities in the context of the new tax regulations proposed in the 2006 budget.   It is anticipated that the findings of this study should establish a foundation for formulating a strategy for the survival of agricultural exports and domestic production capacity by various stakeholder groups.

1.3.   Structure of the Report

Chapter 2 examines the background to the agricultural development context, the macro-economic environment in which Kwacha appreciation took place and the factors that led to it, with reference to the financial sector implications, the sensitivity of Zambia's competitive advantages to exchange rate fluctuations and the current predicament of exporters and domestic producers in general. In this context it examines the likelihood of, and available evidence for, changes in domestic prices of imported agricultural inputs.

Chapter 3 focuses on export agriculture, exploring its scale and performance, the employment it provides, foreign exchange earnings, and growth prospects for cotton, tobacco, vegetables, flowers, coffee, sugar, paprika and honey. These sectors are subjected to profitability analysis using a budget model that modifies input prices according to their responsiveness to exchange rate fluctuations. The propensity to mechanise operations in some cases is also discussed.

Chapter 4 explores the impact of appreciation on domestic production in the same way as the previous chapter on exports. It also analyses the import parity price movements in the light of appreciation, the implications for the production sector and for foreign exchange demand.

Building on this earlier analysis, Chapter 5 evaluates the aggregate impact of the Kwacha appreciation and tax proposals on both export crops and domestic production as well as on poverty and employment. It also reviews the distributional impact in terms of the winners and the losers within the economy.

Chapter 6 examines possible mitigating actions by briefly reviewing the experiences of other countries with management of Dutch Disease in the presence of large agricultural export sectors.

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[1] Note that many of the initial provisions of the 2006 budget have since been reversed to the pre-budget status.

2. METHODS FOR EVALUATING THE IMPACT OF THE KWACHA APPRECIATION ON AGRICULTURE

2.1. Underlying Competitive Advantages and Sensitivity to Exchange Rate Fluctuations.

Competitive advantage in the export market is achieved through efficient management of available resources, while comparative advantage relates to the structure of those resources. The structural dimension refers to geographical and logistical situations such as proximity to ports and communication linkages. Zambia is disadvantaged against some neighbours due to its land locked location and distance to export markets, but is advantaged in terms of climate. It is also well known and a frequently quoted fact that Zambia has abundant natural resource endowments in her fertile land and water available for irrigation. These two require development and servicing with infrastructure at capital cost, which somewhat diminishes the comparative advantages over more developed countries within the region. But, nonetheless, they remain advantages for future expansion.

Land and water are not diminished by Kwacha appreciation but the third advantage, labour, is diminished in terms of comparative cost since wages will not be reduced. The labourers themselves will gain advantage from reduced costs of imports, if they occur, but, as a cost to business enterprises, Zambian labour no longer provides the same competitive advantage in the regional markets. This is because it has become about 30% more costly in terms of foreign exchange. Let us not confuse this discussion with the humanitarian consideration. Labour is indeed poorly paid and there is widespread rural poverty that urgently needs to be addressed. In this context we are simply discussing the cost of labour and its impact on competitive advantage in the export market. It is the issue of employment and rural income earning opportunities that is of greatest concern in the analysis of the impact of appreciation.

The cost of finance in Zambia is high in relation to competing countries, which diminishes competitive advantage. Nominal interest rates include the element of inflation, which should be deducted to arrive at the real interest rate. The more costly element of real interest rates is that imposed by alternative options for bank capital, such as Treasury Bills, and the perception of risk. Currency appreciation would normally be expected to result in reduced inflation and therefore reduced nominal interest rates, but the decline so far experienced is minor, suggesting that they are buoyed up by the opportunity provided by Treasury Bills. Lack of infrastructure and lack of training also diminish Zambia's competitive advantage for exports and domestic production and they are exacerbated by appreciation of the Kwacha.

Since exporters into a competitive international market are price takers, they are bound to apply their expertise and resources to compete effectively against producers in other countries. A detrimental change in production dynamics simply makes them less competitive in the international market. Competition for flowers and vegetables on the markets of Europe, for example, is very stiff and dependent upon constant supply to the markets. Once market share is relinquished it is immediately replaced by alternative suppliers, so there is no scope for a producer to step back into the market once he has withdrawn for any reason. Temporary withdrawal is not an option.

Sensitivity to exchange rates in export crops may be acute since profit margins are kept in check by aggressive international competition. Many countries maintain artificially low exchange rates in order to gain market share internationally.

2.2. Recent Performance and Pressures on Export Agriculture

In recent years Zambian exporters have responded to market incentives and a stable exchange rate by investing in productive capacity, training of staff and establishment of markets. Outgrower schemes have been established or expanded in cotton, tobacco, paprika, coffee, export vegetables, maize, soya and honey. Many of the problems that plagued them in the past have been eliminated by persistent application of expertise, investment, imagination and hard work. One of Zambia's major horticultural exporters reports that it has taken 17 years to establish a reliable supply reputation with their major UK supermarket client, while the major honey exporter has invested 8 years in establishing both markets and supply sources. Private businesses and farms have invested capital at every level of production and processing on the assumption that there was sustained stability in the economy on which medium to long term plans could be based. Growth in the agricultural export sector has been impressive (Figure 1).

The predicament of exporters is that under a sustained strong Kwacha, their revenue will diminish by 30% while costs will fall by a much smaller fraction. Thus, they risk becoming unprofitable at a stroke. Survival strategies include reducing cost by switching from labour to mechanisation and from exports to domestic production. The cost to the enterprise of reducing a labour force in response to economic conditions is very high due to the obligations to pay redundancy or severance pay. Of course the cost to the employee is higher since his or her livelihood is withdrawn and new means of earning a living must be found in a new economic environment.
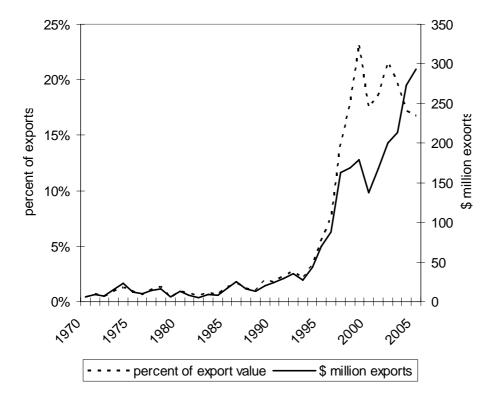
Figure 1   Trends in Agricultural Exports from Zambia

Outgrower schemes are obliged to reduce Kwacha prices paid to producers. As a result, their growers will receive less nominal reward for their labour, although the Kwachas received are of higher value. Growers of produce for the domestic market may enjoy reduced input prices for imported components, but the magnitude of these reductions will depend on the local cost component of inputs. Furthermore, many cost reductions are delayed and given the timing of the recent rapid appreciation these may be irrelevant to the current season. The other factor that threatens viability of domestic production within Zambia's high cost environment is the import parity price which appreciation brings into close proximity with domestic production cost. This is analysed in Chapter 4 below.

2.3. Key Analytical Questions

To investigate likely impact of the Kwacha appreciation on agriculture, this study has examined the following sequence of questions:

2.3.1. *How much will the Kwacha appreciation affect profitability?*

Export revenues, in Kwacha terms, will fall as the Kwacha appreciates. A 30% strengthening of the Kwacha will result in a 30% fall in Kwacha prices received. Input costs will also be affected, but the degree of impact is less clear because some are imported, some are purely local and some represent a combination of Dollar and Kwacha costs. Hence, estimating the net impact of profitability of various actors will depend on detailed knowledge of the cost structure of their production.

We address this question by constructing detailed budgets for each major sector and for each major player in the supply chain, including farmers, processors and exporters. These enable us to assess the impact of a Kwacha strengthening on output prices as well as on various categories of inputs, depending on their import and local cost contents.

2.3.2. *How sensitive are various players to these shifts?*

Given the wide array of farm sizes, locations, experience, input usage and debt levels, both productivity and cost of production vary substantially. Typically, small farmers in remote locations face the highest input costs and lowest output prices. Newer farms typically have higher debt levels than established players. Yields vary substantially according to input use, location and experience.

Qualitative discussions with a wide range of private farm and industry groups have enabled us to broadly categorize the various categories of participants according to their probably sensitivity to exchange rate induced price changes. To assess the sensitivity of various players, the analysis reviews cost of production budgets for various sizes of farm. Likewise, given the substantial rainfall and yield fluctuations from year to year, we explore sensitivity of key results to common range of yield outcomes.

2.3.3. *How will they respond?*

A great variety of response options are available to farmers and exporters. Given the highly competitive nature of export markets, and given the rapidly escalating transport costs out of Zambia, industry groups have been exploring cost-saving options for many years, for most since inception. The sudden 30% fall in Kwacha-based export revenues this season has

accelerated belt-tightening efforts already under way for some time. Common responses have included reorienting input supply sources, seeking alternate, lower-cost modes of shipping and mechanization. Those unable to compete at lower profit margins will exit the industry and seek alternative elsewhere.

In order to identify the responses under consideration by various participants, we have consulted widely with a range of farm and farm support groups as well as key players in the various agro-industry supply chains. Using this qualitative feedback, we have applied our own long-term personal knowledge of large farms, small farms and industry groups to make subjective judgments about how various groups of participants will respond. We recognize that other observers may come to different quantitative assessments, and we welcome alternate assessments of these important questions. What follows are our personal best estimates of what we consider the most likely level changes in production and export earnings.

Adjustments, of course, will take some time to percolate through the system, particularly since the recent, rapid appreciation occurred after most farm and industry groups had already procured inputs for this season. Based on our consultations, we anticipate that full adjustments will take place over the coming two to three seasons.

2.4. Data and Assumptions

2.4.1. Industry Participants

This study has collected a range of primary data from industry participants. In view of the urgency of the study, it was not possible to canvass all stakeholders in the agricultural sector. Instead, selective and representative organisations have been targeted with a questionnaire to determine the structure of their businesses and the likely scale of the impact of currency valuation changes.

In addition, we have sought out key players and industry associations for in-depth interviews. These have aimed at gaining a better understanding of the diversity among various supplier groups, their sensitivities and likely response options.

2.4.2. Secondary Sources

The study has likewise drawn on a sizeable body of empirical evidence available at the Food Security Research Project (FSRP) and at the ZNFU. These sources include farm-level budget data as well as several ongoing sub-sectoral studies, notably on maize, horticulture, fertilizer and cotton, including a comparative regional study.

Where key data have proven elusive or stakeholders have been reluctant to reveal financial information, we have petitioned the Registrar of Companies for access to the latest available certified public accounts. Through this process, we have cross-checked budget information from multiple sources and come up with what we believe are realistic cost structures.

2.4.3. *Exchange Rate*

In view of continuing uncertainties over exchange rate movements during the course of this analysis, the paper explores the impact under three indicative, equally spaced exchange rate intervals of K4,500, K3,500 and K2,500 per US Dollar. These are intended to give broadly indicative projections of profitability movements and likely break points. As several industry commentators have noted, this may result in an understatement of actual profit pressures, given that most have budgeted at a 4,7000 exchange rate and now seem likely to earn at closer to K3,300 per dollar.

2.4.4. *Output Prices*

This analysis adopts the standard small-country assumption that Zambia is a price taker in world markets. Thus world prices remain constant in dollars, while the Kwacha value of those exports falls in direct proportion to the Kwacha appreciation.

2.4.5. *Input Usage and Prices*

This analysis assumes that prices of imported input will remain as constant in dollars terms. The Kwacha costs will vary in proportion to the local content of those imports, as detailed below.

Input quantities (input-output ratios) are taken as constant during the current season. This is necessarily the case, since most farmers and processors had procured inputs prior to the Kwacha appreciation.

Over time, however, substitution among inputs and supply sources will likely take place. Thus, the discussion of potential responses highlights where these changes are likely to occur.

Wage rates are taken as fixed, given minimum wage legislation currently in force. Labour use is likewise taken as fixed in the short run given the currently legislated high costs of laying workers off. In the medium run, however, many groups indicate they will mechanize key operations and this will lead to employment reductions over the medium run.

2.4.6. *Sensitivity Analysis*

Given a broad array of scales of production and productivity among smallholder farmers, this analysis has focused on the most commercially oriented smallholders. Therefore, in the budget analyses that follow, projected yields do not necessarily reflect average national figures but rather those prevailing among the commercially oriented smallholders and emergent farmers. Thus, these numbers will tend to overstate profitability among the more remote and less experienced producers. In view of the major differences in input use and productivity, most farm budgets have been prepared separately for large and small farmers.

During the current, transition year, profitability will be affected by a number of anomalies. Farmers and processors purchased inputs at a 4,500 to 4,800 exchange rate. Yet they will sell output between 3,200 and 3,500. Likewise, the current season promises an above-average

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harvest in most areas. This will soften the blow of price reduction for many small-scale farmers during the current seasons. Therefore, many of the major commodity sub-sectors examine both the medium-run as well as the transition year impacts of the Kwacha appreciation.

2.4.7. General Equilibrium Effects

To the extent that agricultural exports diminish in coming years, the resulting loss in export earnings will tend to weaken the exchange rate in coming years. To the extent that farmers mechanize operations and lay off workers, this may influence the negotiated rate of wage rate increases. Given existing institutional rigidities, however, no industry participants anticipate an outright fall in farm wages. Output and consumer prices will change in response to changing income levels. And distributional impacts of the Kwacha appreciation will clearly emerge. Urban consumers paid in Kwachas will benefit as prices of imported cars, stereos, cell phones and spare parts fall. Rural groups will see earnings erode as their export earnings fall. Falling prices may partially arrest this fall in real incomes.

These general equilibrium effects will be examined in a separate paper being prepared by the Bank of Zambia. Under agreement between the ZNFU and the Bank of Zambia, this paper has been prepared as a companion piece to a more general analysis currently being conducted by BOZ. This analysis is intended to focus on the impacts of the Kwacha appreciation on agriculture. The companion paper by BOZ is intended to investigate impacts on others sectors of the economy which will enable them to examine the distributional and general equilibrium effects of a Kwacha appreciation.

2.5. Evaluating Export Profitability Following the Kwacha Appreciation

2.5.1. Why Prices of Imported Goods do not Move in Exact Parallel with Exchange Rates

Exchange rate movements will affect not only the Kwacha price received for exported goods but also the cost of inputs. The extent to which a strengthening Kwacha will lower production costs, thus, depends on the import content of the inputs used in any particular economic activity. Figure 2 illustrates this effect using a hypothetical example. Consider an exporter who exports a product for $100 but whose cost of production is half imported inputs and half local costs. As the Kwacha appreciates, the $50 of imported inputs do not change in cost. The firm still spends $50 on them. However, the local costs, even though they remain constant in Kwacha now require $64 (22% more dollars) to purchase. This is because wage rates and other local costs remain constant in Kwacha terms, but these require more dollars as the Kwacha strengthens. Overall, in this example, the exchange rate strengthens by 22% but total cost of production rises by only 14%, less then this amount, because only a portion of the inputs are denominated in Kwacha.

The second panel in Figure 2 illustrates the parallel case of a domestic producer who sells locally in Kwacha. As before, the firm's cost structure includes half imported inputs and half labour and other Kwacha-based costs. As the Kwacha appreciates, the Kwacha input costs remain constant at K225,000. But at the same time the Kwacha cost of imported inputs falls from K225,000 to K175,000. Overall, input costs fall by 11%, less than the 22% level of Kwacha appreciation.
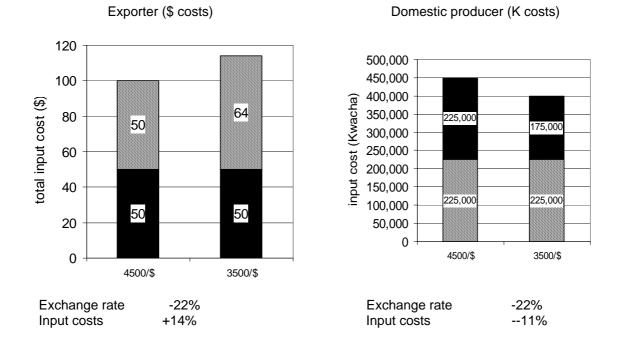
Figure 2. Why Inputs do not Change as much as Exchange Rates

Exporter ($ costs)

Domestic producer (K costs)

	Exchange rate	-22%		Exchange rate	-22%
	Input costs	+14%		Input costs	--11%

2.5.2. *Categories of Agricultural Inputs*

Inputs to agricultural production fall into three categories in terms of sensitivity to changes in the exchange rate:

1. Those that are imported directly by the user who converts Kwacha to foreign exchange, such that the costs are limited to foreign purchase price, transport, duty and VAT, where applicable. In Kwacha terms, these input prices change in direct proportion to changes in exchange rate, provided that the customs department uses the current exchange rate in the calculation of duty and the transport charges are denominated in foreign exchange. In Dollar terms they should remain unchanged since duty should be converted at the ruling rate. Businesses with the administrative capacity to manage their own importations can include a wide range of items in this category from agro-chemicals and capital equipment to fuel if they are licensed to handle it.

2. Those that are imported by an agency and are sold to the user in local currency, which bear the same initial cost as (1) above but also bear the local costs of the importing agency, such as salaries, rent, communications, taxes, storage, repackaging, insurance, interest, and reward for enterprise or commission. In Kwacha terms they become marginally cheaper and in Dollar terms marginally more expensive. When businesses do not have the capacity to manage their own importations, or the scale of their requirements does not merit the effort, they are obliged to purchase their inputs from agents and bear the Kwacha-denominated local distribution costs. All imported items are in this category for those who do not import their own.

3. Those that are purely local, like wages, electrical power, local bank charges and taxes. In Kwacha terms these remain the same and in Dollar terms they become more expensive in direct proportion to the appreciation.

2.5.3. Category 2 Inputs

Kwacha prices in the second category vary in relation to the exchange rate, though not in direct proportion since a part of their cost is directly related to the exchange rate and the other part is related to local cost. The degree to which their cost is proportional to the exchange rate depends on the extent of local repackaging, storage times, and the market forces that play on traders' margins. The latter is a function of competitive retail environment, perceived consumer surplus (consumers' willingness to pay the asking price), availability or supply and demand, trader cartels and lack of consumer awareness about what they are buying.

It is this second category that is the most contentious since it is subject to administrative complications and to opportunism. Those hailing Kwacha appreciation as a potential boost to the economy assume that prices of imported goods, retailed locally, will fall. However, several factors uphold the prices, not least the general reluctance of traders to lower prices under any circumstances while there is demand for the goods.

One of the mechanisms in play is the ratchet effect when there are two currencies involved, which allows traders to quote in the currency that gives the better return. Witness, for example, the case where a hotel charges the $140 per night or K630,000 when the exchange rate is K4500 per US Dollar. When the exchange rate falls to K3500, and encouraged by government decree to charge in Kwacha, the hotel continues to charge K630,000 which now equates to $180; an increase of 28.6% to the tourist and visiting businessman. However, had there been a devaluation, no doubt the Dollar based charge would have prevailed and the Kwacha rate increased to sustain the Dollar income. Thus traders can apply a ratchet effect to their prices by stepping from one currency base to the other according to which gives the better return.

Similarly, in the case of dutiable insecticides, an agent that imports stock at say K4500 per US$ and stores them in a bonded warehouse and declares them in his accounts as stock-in - hand nominated in Kwacha. When selling them, the exchange rate is K3500 per US$, so he is unwilling to revalue them since, denominated in Kwacha, it appears that he would be making a loss.

Another argument put forward is that when stocks are bought at one exchange rate, they must be sold at a price that reflects that exchange rate and not their replacement cost. This is erroneous because the currency applied to their selling price has a current value that compensates for the foreign exchange cost at the previous rate. One Dollar's worth of goods bought with 4800 "August 2005 Kwachas" can be replaced by 3250 "January 2006 Kwachas" and, therefore in January 2006 should be sold at a price that reflects K3250/$, although they cost K4800 in August 2005. However, it does make for complicated accounting and can give misleading profit and loss results.

One agro-chemical agent states that more than 90% of his stock is sold locally to farmers in foreign exchange, and that 75% of his costs are incurred in Kwacha which have not been reduced as a result of appreciation. Therefore, at the appreciated Kwacha exchange rate, more Dollars are required to cover the Kwacha costs, and the Dollar denominated retail price goes *up* by 75% of the appreciation rate to achieve the same gross margin, and not down as might be expected at a glance. By implication the Kwacha denominated price should go down by the extent of appreciation (say 30%) multiplied by the proportion of the cost that is foreign exchange derived (25%), which is only 7.5%.

The response to appreciation in the case of fertiliser prices is illustrated in Figures 3-5 below which chart the Kwacha/Dollar exchange rate and the fertiliser prices. It shows that the decline in exchange rate is not mirrored by decline in fertiliser price. A similar picture emerges for fuel prices, while electrical power and labour show much wider divergence form exchange rates.
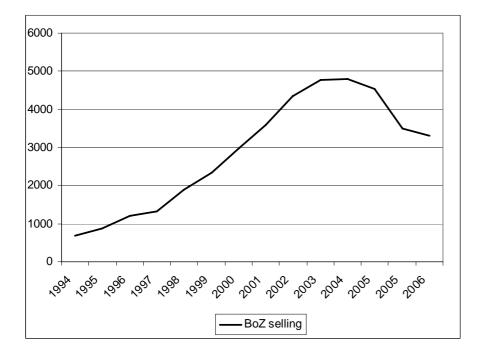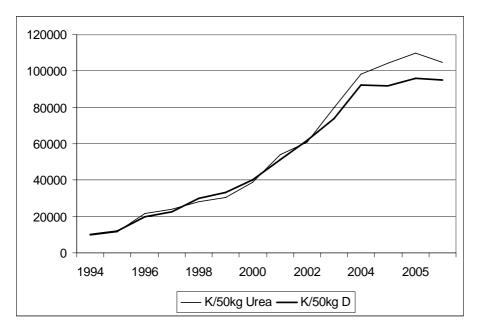
Figure 3. Exchange Rates

Figure 4. Fertiliser Prices in Kwacha per 50kg Bag
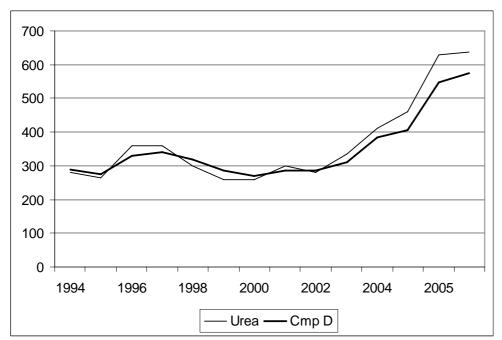
Figure 5. Lusaka Fertiliser Prices in Dollars

(The time scale is not linear but has been extended in 2005 and 2006 to show the changes in detail).

It is this situation that provides the incentive to farmers to import their requirements directly, sidestepping local agents who will either have to increase their margins even further to cover their fixed costs on lower turnover, streamline their efficiency or go out of business. Fewer outlets imply a smaller platform for competitive pricing, wider scope for establishing cartels and greater difficulty for those wishing to purchase a small quantity in a hurry that does not justify direct importation..

It has long been the case that retailers have been unwilling to publish retail prices. One reason for this is that a published price list provides a benchmark for "briefcase" companies to apply a competitive price to inferior products for the customer who is not careful about his purchases. For instance, a chemical with the same name may be available at two different prices from two different outlets, but the slightly cheaper one sold by the briefcase company may be much more diluted than the more expensive, and therefore of less value. It is against this practice that established agents covet their price lists. It also can provide scope for "consumer surplus" pricing such as is applied in street markets where prices are negotiable.

The conditions described here for agro-chemicals are not exclusive to this trade but generally applicable to the retail sector, so that the anticipated reduction in prices of imported goods may be more the result of competition between traders than the immediate result of appreciation.

2.5.4. Category 3 Inputs

Prices in the third category bear little relation to the exchange rate in the short term. It is unrealistic to believe that wages can be reduced even though their buying power may have increased. Indeed it is highly likely that there will be demands for increases in wages at the forthcoming round of negotiations. The extent to which Zambia Electrical Supply Company (ZESCO) is willing or able to reduce charges depends on their financing structures and the proportion of their costs that are incurred in local currency. Local bank charges are linked only

Table 1. Pricing Principles Applied to Factor Costs and Returns with Changes in Exchange Rate

Item	Price Change Factor for 1% Appreciation	
	For Kwacha based domestic production	For Dollar based export production
Locally purchased imported inputs	- 0.25 x change	+0.75 x change
Direct imports	-1	0
Locally produced inputs	0 as yet	+0.75
Fuel	-0.456	+0.7736
Labour	0 until agreement	+1
ZESCO power	0	+1
Interest rates on Dollar loans	-1	0
Interest rates on Kwacha loans*	0	+1
Kwacha earnings/returns	0	-1

*The factor for interest rates relate to the immediate impact of appreciation from the perspective of the business. In the longer run, appreciation should also reduce the interest rate through its effect on inflation.

indirectly to exchange rates in that an appreciation of the currency would normally imply a reduction in the rate of inflation and hence interest rates. However, in the current situation it appears that the sale of treasury bills has provided opportunities for profit taking to the banks with which the agricultural sector must compete. Hence interest charges are applied to loans that make them compatible with treasury bills in terms of income generation for the banks.

It is in the context of these influences on agricultural input prices that production budget models have been used to test the impact of Kwacha appreciation on costs of production of major crops. The principles applied to factor costs are summarised in Table 1 above on the basis of the above discussion. However, since the reaction of traders has not yet been fully revealed, these changes are presented as assumptions only, although they are based on evidence that is available to date. The impact on selected crops is traced using these principles in the chapters that follow, firstly on export crops and subsequently on crops for the domestic market.

Export sales converted to Kwacha are diminished in direct proportion to appreciation whereas in Dollars they are not affected. These exchange rate responsiveness coefficients are applied to the detailed itemized crop budgets available in the annexes to this report.

To simplify the exposition in the main text of this report, the following tables classify inputs into five categories: those that increase Kwacha costs by 100%, 75%, 50%, 25% and 0% in response to a strengthening Kwacha. This classification will serve to summarize the cost structure of each enterprise in a way that makes clear the relative vulnerability of each activity to changes in the exchange rate.

2.5.5. Capital Costs

In analysing annual production costs, the cost of capital required for the enterprise has firstly been estimated on a per hectare basis and then annualised by converting lump sum payments into a flow. The annual cost is a function of the useful life of the asset and the interest rate.

The formula applied to convert lump sum payments into annual cost is:

$$R = \frac{rK}{1-(1+r)^{-n}}$$

Where: R = constant annual capital service flow
           r = discount rate
           K = initial cost of asset (per ha)
           n = life expectancy of the asset.

For example, a capital asset worth K100 that lasts for ever while the interest rate is 15% will cost K15 annually, and one that lasts only one year will cost K115 on an annual basis.

An average life expectancy has been taken for the range of capital assets applied to each enterprise since some will last longer than others.

2.5.6. *Timing of the Kwacha Appreciation in the Context of the Current Season*

The timing of the Kwacha appreciation has affected farm incentives in two diametrically opposite ways during the current transitional season. Because the rapid appreciation occurred during the second half of November, after most farmers had purchased their inputs, prepared their fields, and had begun planting, most purchased inputs at the expensive 4,500 to 4,700 exchange rate. By harvest time, the lower 3,200 to 3,300 rate appears likely to prevail. For export crops, this means that farmers will pay high Kwacha prices for inputs while receiving low Kwacha prices for their output, placing a severe squeeze on financial margins.

Offsetting this financial squeeze is the bumper crop anticipated as the result of an unusually good rainfall year. The regularity and volume of rains appears likely to produce an above-normal harvest for most rainfed crops. Therefore, this weather-induced production boost will tend to offset the increased financial cost of inputs and the reduced Kwacha price of output. The budget analyses in sections 3 and 4 measure the net impact of these two counteracting effects.

2.6.   Changes to the Agricultural Economy as a Result of the 2006 Budget

2.6.1. *Classification*

From 1 July 1996 to 6 February 2004, most agricultural products and inputs were zero-rated for VAT, meaning that the farmers were entitled to reclaim the VAT suffered on the allowable purchases, thereby lowering the cost of production. On the sale of the agricultural products, there was no VAT charged to the customer as the VAT rate used was 0%. The law was affected through Statutory Instrument number 110 of 1996.

The products which were zero-rated included the following (except when supplied by a restaurant, cafeteria, canteen or like establishment):

- Agricultural products – fresh edible vegetables, paprika, fruit nuts, maize and mealie-meal, soya beans, millet, cassava, sorghum and flours produced from them, wheat and other cereals.
- Animal products – meat and offal of cattle, swine, sheep, goats, game farm animals and poultry (including eggs).
- Milk – except powdered milk and any milk in cans or tins.
- Fish- uncooked, frozen or dried.
- Agricultural supplies –
  - bulbs, seed and plants for producing agricultural products in (a) above;
  - fertilizers, insecticides, rodenticides, fungicides, herbicides, anti-sprouting products and plant growth regulators and similar products for agricultural use;
  - live cattle, swine, sheep, goats, game farm animals, and poultry;
  - stockfeeds for animals in (iii) above;
  - empty jute and polypropylene bags;
  - cotton seed and seed cotton;
  - cotton lint, and
  - flower seed.

In contrast, some agricultural products have remained standard-rated (i.e. both inputs and outputs are taxable at the standard rate, currently 17.5%) since the VAT was introduced in Zambia on 1 July 1995. Such products include the following:
- coffee
- cotton wool
- roses
- tobacco, and
- wheat flour

Farmers engaged in zero-rated or standard-rated agricultural production were eligible for VAT registration as they were involved in production using taxable inputs. The registration enabled them to enjoy the Import VAT Deferment Scheme which provided the Import VAT relief on imported capital equipment, thereby giving the farmer a cashflow benefit, since there was no Import VAT payable. However, only businesses with an annual turnover of over K200 million are entitled to registration. While most commercial farmers meet this requirement, few of Zambia's 800,000 smallholders do. Ineligible for registration, they are likewise unable to reclaim VAT on taxable inputs.

On 6 February 2004, following the Budget announcement, all the agricultural products and supplies listed above, which were previously zero-rated, became exempt for VAT purposes, meaning that the farmer could no longer reclaim the VAT suffered on the allowable input purchases. This effectively included the VAT paid on the inputs in the cost of production. The measures were legislated through Statutory Instrument number 14 of 2004 and Government categorically stated that it was a temporary measure to last until the HIPC completion point.

Government did not resolve the issue of VAT in the 2005 National Budget because by then Zambia had not yet qualified for the HIPC completion point. Zambia qualified for the HIPC completion point in April, 2005 and therefore the agricultural industry expected the

Table 2. Categories of VAT Application

VAT Category	VAT on standard rated inputs	VAT on output	Is VAT claimed on inputs?	Implication	Agricultural Products and Inputs affected under the original 2006 budget proposals
Zero rated	17.5%	0%	Yes, **only if** registered for VAT	Least cost to consumer.	No products
Standard rated	17.5%	17.5%	Yes, **only if** registered for VAT	Highest cost to consumer. Small farmer disadvantaged since s/he is unable to reclaim VAT paid on inputs.	All agricultural products and supplies (inputs) except infant cereals, maize and maize meal.
Exempt	17.5%	0	No	Moderate cost to consumer. High cost to all farmers.	Infant cereals, maize, mealie meal

Government to honour its promise by re-classifying agricultural products and supplies to the zero-rated status which was obtaining before the 2004 National Budget.

VAT rates are either zero or 17.5%. There are no intermediate rates. Three categories of VAT application are used, which are listed with their implications in Table 2.

Note that maize is zero rated in South Africa, Kenya and Mozambique. Fresh vegetables are zero rated in South Africa and wheat is Zero rated in Mozambique. Zambia and New Zealand are the only countries that impose output VAT so widely on production and consumption of basic food stuff.

Since VAT can be reclaimed only by those who are registered for VAT with Zambia Revenue Authority (ZRA), VAT on inputs discriminates against those who do not reach the threshold of K200 million per annum turnover, i.e. smallholder farmers. Their costs of production include VAT on inputs whereas registered growers pay only the interest on the VAT on inputs. The impact of VAT on output, on the other hand, favours informal market operators since they will not charge their customers VAT on sales, but VAT registered growers would be obliged to do so under the initial 2006 budget proposals.

Maize is exempt and therefore all growers are in the same basket since exempt status means that none of them can reclaim VAT on inputs. Vegetables for instance are standard rated and standard rating for VAT has discriminatory implications on both inputs against non-registered growers and on output against registered growers.

VAT on output is a far more significant imposition than VAT on inputs since inputs constitute only between 35% and 85% of the output depending on the enterprise.

2.6.2. *Tax Withholding*

The initial 2006 budget proposals introduced a withholding tax to be deducted at the rate of 45% from the sale price of a product worth more than K200,000 by the buyer and submitted to ZRA unless the producer is able to provide a ZRA Tax Personal Identification Number (TPIN). The producer may reclaim the Withholding Tax deduction upon registration with ZRA and presentation of sales invoices from which Turnover Tax may be deducted at the rate of 3% (assuming a turnover of less than K200 million per annum). The Withholding Tax is set at punitive levels as a goad to register with ZRA.

The damage to the smallholder is in the transaction cost since he or she may make only one sale in a year and will be obliged to encounter the bureaucratic face of government in a town centre that may be not only intimidating but inconvenient due to the distance to be travelled. There are many situations in Zambia where the cost of a journey to the nearest ZRA office will be far in excess of the amount to be reclaimed on a transaction. Once registered, the producer will be required to pay turnover tax on all transactions but not withholding tax – so long as the TPIN can be shown to the buyer.

The withholding tax, like the proposed VAT on agricultural products, will discourage farmers from selling through formal market outlets, where purchasers are required to impose these taxes. Sales through informal channels, which ignore the VAT and withholding provisions, will prove more lucrative for farmers.

3. ECONOMIC IMPACT OF THE KWACHA APPRECIATION AND THE 2006 TAX PROPOSALS ON AGRICULTURAL EXPORTERS

The major agricultural export enterprises are analysed individually below by first examining the extent of their exports and the employment resulting from it and then by viewing how Kwacha appreciation impinges on their profitability and the consequences for their sustained viability.

Since revenue from export crops is in foreign currency, the enterprises are viewed from the perspective of the US Dollar. Due to the complexity of some export enterprises, such as vegetables, an overview of operations has been taken rather than detailed analysis of each crop.

3.1. Cotton

Cotton production and export has grown rapidly in Zambia since the privatization of the sector in 1994. The resulting dismantling of the parastatal, Lintco, and sale of its gins and other assets led to the establishment of two major private cotton companies, Lonrho Cotton and Clark Cotton, as well as half a dozen smaller ginners and processors such as Amaka, Continental and Mulungushi Textiles. Most ginners run outgrower schemes, supplying inputs and purchasing output from roughly 300,000 smallholder outgrowers. Although approximately ten commercial farmers produce seed cotton for the ginners, smallholder outgrowers dominate lint cotton production. The following discussion examines the cost structure and impact of Kwacha appreciation on both the exporting companies (the ginners) and on the smallholder outgrowers.

3.1.1. Ginning Companies

The expected turnover for the 2005/6 season is US$ 92 million in export sales (including fuzzy cotton). Ginning companies claim that 85% of costs are Kwacha based and that an injection of US$27 million would be needed to cover these Kwacha based costs if the exchange rate of K3,550 /US$ persists to February next year. The usual seasonal banking facilities for purchasing the seed cotton from farmers at the previously announced price of K1220 per kg would be denied under these circumstances. If the rate of K3,500 were to prevail and the company were to absorb the consequent increase in cost of processing, they could pay no more than K949 to the farmer who would therefore suffer the loss of appreciated Kwacha. The argument that those Kwacha had increased in value by 22% or more is unlikely to be persuasive among the outgrowers. In the current season, there are roughly 300,000 cotton outgrowers who support in total about 1.5 million dependents or 16% of the population – the poorest section of it.

The effect in principle of appreciation of the Kwacha on the ginning companies is illustrated in Table 3. The immediate survival strategy for ginners is to reduce the price they pay to the farmer in Kwacha terms although it may still be equal in Dollar terms. Yet even under this Kwacha price reduction to farmers, if gross margins were 8% of turnover at K4500/US$, then ginners' net profits become clearly negative as the Kwacha appreciates to 3,500 and below. For this reason, ginning companies are likewise actively seeking additional means of economising, including cessation of hand-sorting to eliminate contamination and direct

Table 3. Impact of Appreciation in Principle on Ginning Operations

| | Responsiveness | Cotton Ginners and Exporters | | |
| | | Exchange rate | Inputs and sales at | Inputs and sales at |
		4500	3500	2500
Cotton Ginners and Exporters				
Revenue				
lint exports ($ millions)	0%	$70	$70	$70
oil and seedcake ($)	0%	$7	$7	$7
total revenue		$77	$77	$77
Costs ($)				
imported inputs (chemicals, etc)	0%	$11	$11	$11
local inputs				
- cotton purchased from farmers	0%	$35	$35	$35
- transport, interest, labor, seed, etc.	100%	$25	$30	$36
total variable costs		$71	$76	$82
capital costs	0%	$5	$5	$5
total costs		$76	$81	$87
Profit Margin				
gross margin (revenue-variable costs)		$6	$1	-$5
as % of turnover		8%	1%	-6%
net profit (gross margin - capital costs)		$1	-$4	-$10
as % of turnover		2%	-6%	-13%

Assumptions: initial gross margin is 8% of turnover; sales of byproducts = 10% of lint value.

importation of inputs, bags, capital equipment and transport services instead of using local agents. If the strong Kwach persists, and profits remain negative, major ginners indicate they may have to shut down their Zambia operations.

VAT on inputs is reclaimable since cotton is a standard rated product. However, interest is to be paid on the VAT component until the reclaim is effected. Standard rating also implies that VAT is charged on the output from the farmer to the ginning company, which would then claim it back on exporting it. This implies further interest charges on the output VAT component until reclaimed. Changes in tax withholding requirements will not affect the ginners, as they are already registered tax compliant and therefore already pay corporate income tax. However, the withholding provisions of the new budget act will impose new fiscal burdens on smallholder outgrowers unless individual outgrowers are to be treated under special provisions for outgrower schemes.

3.1.2. Cotton Outgrowers

The changing incentives facing smallholder cotton outgrowers is examined here under three exchange rate scenarios as well as under the proposed VAT and Withholding Tax regulations. It is assumed that the farmer partly relies on residual fertiliser, but pays for the seed and insecticide while the company pays for packaging and transport. It also assumes that seed and insecticides bought in Kwacha reduce in Kwacha denominated price by 0.5% for every 1% appreciation of the Kwacha provided that loan recovery is not impacted by lower price.

The outgrowers themselves are not registered for tax and therefore do not charge VAT on their sales to the ginning company and are not entitled to reclaim on their own input VAT costs since they do not reach the K200 million turnover threshold. On the other hand, under the initial 2006 budget proposals, the ginning company is obliged to deduct 45% from each grower selling more than K200,000 worth of produce and submit it to the ZRA. If s/he is registered with the ZRA for income tax purposes, the outgrower can theoretically reclaim this withholding at the end of the government fiscal year. In normal seasons, this will amount to approximately a 9 month delay. Even at the most favourable bank lending rate of 29% this would amount to a loss of K73,950 on the typical K340,000 withholding if the interest was simple, and K81,640 when compounded over 9 months. On top of this, the transaction costs in preparing withholding paperwork and travelling to and from the nearest ZRA office will amount to another significant share of the typical K340,000 withheld. Farmers in remote areas will have less incentive to reclaim than farmers residing close to a ZRA office. The following budgets compare outcomes for farmers who face transaction costs too high to reclaim the 45% withholding with those who can. In the case of tax registered smallholders, we assume imposition of the statutory 3% turnover tax.

Column A in Table 4 below shows that returns from cotton per man-day were already meagre before appreciation of the Kwacha, although returns do exceed the $1 per day poverty line as well as the agricultural minimum wage. The value of cotton to smallholders is that it does provide cash income at a time of year when it is most needed. The utility of cash income is high to a cotton grower at harvest time.

Table 4. Cotton Outgrower Returns to Labour

		Exchange Rate Effects			Tax Changes				Transition year yield effects		
		A	B	C	D	E	F	G	H	I	J
					Inputs at new rate Plus VAT	D plus 3% turnover tax exporter pays ZRA	farmer pays ZRA	witholding 45%	B+ inputs at old rate	B+ inputs at old rate	H + improved yield
Ex Rate	K/$	4500	3500	2500	3500	3500	3500	3500	3500	3500	3500
Change	%	0%	22%	44%	22%	22%	22%	22%	22%	22%	22%
Farm gate price$/MT		271	271	271	271	271	271	271	271	271	271
Farm gate price K/kg		1220	949	678	949	920	920	522	949	949	949
Yield (kg/ha)		800	800	800	800	800	800	800	600	800	1000
Revenue (K/ha)		975,600	758,800	542,000	758,800	736,036	736,036	417,340	569,100	758,800	948,500
COSTS (K/ha)	Change factor	-									
Seed and chemicals	-0.5	229,500	204,000	178,500	239,700	239,700	239,700	239,700	229,500	229,500	229,500
Tax transaction costs						-	200,000	-			
Labour days		115	115	115	115	115	115	115	115	115	115
Gross margin (K/ha)		746,100	554,800	363,500	519,100	496,336	296,336	177,640	339,600	529,300	719,000
Return to labour K/day		6,488	4,824	3,161	4,514	4,316	2,577	1,545	2,953	4,603	6,252
Return to labour $/day		1.44	1.38	1.26	1.29	1.23	0.74	0.44	0.84	1.32	1.79

Source: derived from ZNFU budget model

Column B shows the situation at K3500/$, a theoretical case that approximates to reality. In this case, returns per man-day fall to K4,800, well below the agricultural minimum wage. At an exchange rate of K2500/$, returns fall to roughly K3,200 per day.

When VAT is also applied to the 3,500 exchange rate, returns per man-day falls to K4,500 (Column D). When Turnover Tax of 3% is deducted by the exporter the return is reduced to K4,300 (Column E) but when the farmer himself faces transaction costs of going to town to register and pay the tax himself, transaction cost would be at least K200,000 spread over one hectare. In this circumstance, returns falls drastically to below K2,600 per day (Column F). When the 45% withholding tax is deducted, returns fall to around K1,500 per day (Column G) – a condition that is wholly incompatible with poverty reduction goals.

The combined impact of exchange rate strengthening, which lowers farmgate prices, and increased taxes, which raise farmers' costs, is that increased numbers of outgrowers perceive that returns have fallen too low to compensate for their effort. Some are said to be abandoning their cotton crops, which, although less rewarding than maize, are usually considered more secure. They are blaming the cotton companies for the situation although it is out of their control.

Countering this financial pressure, however, is the above-average harvest anticipated this season due to abundant, well-spaced rainfall. Smallholder cotton farmers can expect to see yields anywhere from 15% to 25% higher than normal. This production windfall will serve to moderate the fall in kwacha denominated cotton prices. Compared to the long-term average yield of 600 Kg/ha, which produces returns of K3,00 per day, farmers attaining yields of 800 Kg/ha will earn K4,600 per day. The more efficient farmers, who produce one ton cotton yields, will see transition year returns closer to K6,300 per day. While favourable weather this year will cushion farmers during the 2005/6 season, reversion to normal yield levels in coming seasons will likely result in large-scale small farmer exit from export agriculture (Figure 6).

Potential large-scale exit from cotton production would seriously undermine current poverty reduction efforts, as the role of cotton in injecting income into rural areas and among the rural poor is unsurpassed by any other commercial agricultural enterprise. As a recent study of Zambian cotton has concluded, "… our results highlight promising avenues for poverty alleviation through cash agricultural activities such as cotton." (Balat and Porto 2005). However, the upward trend in production from which more and more communities were gaining through cotton is highly likely to be reversed, and those communities who had hopes of being included in the cotton growing fold will be disappointed. In the longer term, the possible demise of this industry in Zambia, quite apart from its diminished contribution to the national balance of payments, would be devastating for the 1.5 million who currently depend on it.

3.1.3. Impact on Cotton Ginners and Outgrowers

Ginners' margins become negative at K3500/$ but their commitments in capital equipment and human skills makes it extremely costly either to reduce production, since economies of scale are lost, or to cease production because of un-utilised capital and the costs of redundancy. As a survival strategy, ginners are therefore obliged to economise on employment and on all local expenditure at the cost of employment opportunities that might be lost to mechanisation and redundancies, and on trading with local companies whose opportunities will be lost to foreign enterprises, for example in transport and maintenance contracts. The ginners will certainly not

expand their outgrower reach. On the contrary, they will rationalise the areas under production and withdraw their contact from those areas which are least economically viable. In the event that the exchange rate persistently acts against them, they will be obliged to close their operations and withdraw the income earning opportunities from their existing outgrowers.

Outgrowers, whose return to labour, at K6,500 per day, is already hovering near the agricultural minimum wage, will be obliged to accept even lower rewards (between K4,800 and K3,200) or find alternative means of earning a living. Those communities in remote areas who have been attempting to engage in cotton production will be disappointed, and those in areas that have become uneconomical will have to find alternatives. VAT on inputs, and turnover tax or withholding tax will further exacerbate poverty among the poor.

At a 3,500 exchange rate and a grower price of 950 K/kg, we expect roughly a 25% decline in cotton production by smallholders (Figure 6). This amounts to a reduction of potential export earnings of $20 million and loss of income earning opportunities for 70,000 growers and associated workers.
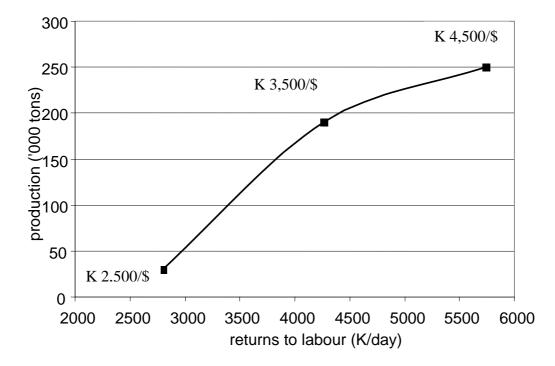
Figure 6. Smallholder Cotton Growers Responsiveness to Exchange Rate Appreciation

3.2. Tobacco

Two types of tobacco are produced in Zambia: Virginia, otherwise known as flue-cured, and Burley which is cured without heating. Virginia is grown by 86 large-scale growers (from 10 ha to 680 ha) and about 8,000 smallscale growers. Burley is grown to the east of Luangwa exclusively by smallholders, numbering 15,400. Together these crops provide income to 120,000 people and earned $63 million in foreign exchange in 2004/5. The current season is expected to yield 20 million kg of Virginia and another 20 million kg of Burley.

3.2.1. Virginia Tobacco

In recent years, Zambia's tobacco industry has taken great strides forward from a low base of 2.3 million kg in 1992 to nearly 40 million kg in 2004/05. This total, of which 22.5 million kg is Virginia, fetched an average price of $1.89 in 2004/5. A substantial order from China of 40 million kg of Virginia is on offer pending the mutual signing of a trade agreement, and investment in a new processor with the capacity of adding value to 40 to 50 million kg per annum has been planned.

The industry received a boost from new investors in recent years who have borrowed heavily, and these investments are now yielding increased production despite the fact that the price has not moved substantially for 3 years. Established growers with less debt gearing are less vulnerable than new growers who are faced with debts incurred in Dollars on budgets predicated on input costs amounting to $2,500 per ha. before financing costs. Farmers who have borrowed between 80% and 100% of variable costs, totalling between $500,000 and $800,000 each at between 7% and 12% interest charges are in a precarious state and, indeed it is reported that several have already had to cease operations and others have had to pass control of their finances to their respective lending institutions.

Commercial tobacco farmers on this scale employ approximately 3 labourers per hectare in the field on their tobacco enterprises, which require about 550 labour days per ha., implying that the total number employed in the field in the Virginia tobacco sector is between 33,000 and 36,000. The Tobacco Association of Zambia (TAZ) indicates that 42% of total costs in the industry were on labour prior to appreciation, so this proportion will tend to increase since there are few options for mechanisation.

The effect of appreciation on their budgeted production is highly damaging because this major cost component, labour, cannot be reduced and has in effect risen in Dollar terms. It ranks Zambia's competitiveness below Malawi, Tanzania and Brazil who are said to be able to produce tobacco at less than 40 to 50 US cents per kg compared to variable costs of $1.2, $1.7 and $2.0 in Zambia at the three exchange rates K4,500, K3,500 and K2,500.

The impact of appreciation on the profitability of commercial Virginia tobacco production is calculated on the assumption that inputs are purchased from local agents in foreign exchange, that labour, fuel, electric power are paid for in Kwacha. VAT is payable on inputs but is recoverable by VAT registered growers on the export of the crop. Although the sectors four score commercial farmers are registered growers, the bulk of the industry's 23,000 smallholders are not.

Tobacco, and particularly flue-cured tobacco, is a capital intensive enterprise due to the need for curing facilities and equipment and irrigation which is assumed to amount to $600 per ha annualised at 15% interest and depreciated over 15 years for management accounting as opposed to tax accounting. The table shows a loss when inputs were purchased at the rate of K4500 and output sold at K3500, indicating that loans will not be repaid. The loss becomes much more severe when inputs and outputs are purchased at the same rate of K3500 and below, implying collapse of the most highly leveraged or less structurally efficient participants in this industry.

Since tobacco is a crop that is suited to areas where other crops will not prosper, there are very limited options for alternative opportunities for income generation. This implies that such areas will be abandoned and the livelihoods of those who depend upon tobacco will be destroyed. Furthermore, the investments made will be lost with consequent default on loans, and the foreign exchange income will be foregone.

VAT issues have not been examined in detail here since input VAT is reclaimable for export crops. There is the cost of interest on VAT and the issue of absorption of capital for VAT, both of which make the industry more precarious.

3.2.2. Smallholder Tobacco Producers

Smallscale growers are numerous in the tobacco sector and more than half of them concentrate on the less capital intensive burley tobacco. They are principally in the same predicament as that described above for smallscale cotton growers.

They are also liable for tax but are unable to reclaim input VAT if their turnover does not exceed the K200 million threshold. If they are not in possession of a tax certificate they will be charged 45% withholding tax on their output for sales in excess of K1.5 million. This is reclaimable at the end of the government financial year once the grower is registered and has paid his turnover tax. TAZ would be obliged to become a revenue collection point for ZRA and to assist in the registration of all growers. But this process implies a massive transaction cost in proportion to the turnover of the grower, which itself amounts to such a high tax on his income as to discourage his participation in the formal economy.

3.2.3. Impact on Tobacco Growers

Tobacco production at K3500 per $ is uncompetitive (Table 5) and will lead to failure to repay loans and a large scale exit from commercial tobacco production by new entrants in particular since they are more vulnerable being more highly leveraged with debt. It may be possible for well established growers who are less dependent on debt to maintain a level of production that would reflect Zambia's capacity in the early 1990s of about 3 million kgs. Our discussions with farm groups suggest that this is likely to reduce output by about 75%, to the levels experienced prior to the recent investment by new entrants. This will result in a loss of export earnings of up to $47 million and loss of employment for up to 86,000 workers. It will also lead to the loss of Zambia's growing reputation as a producer of good quality tobacco. Remaining production, valued at about $16 million, will remain largely in the hands of the well established farmers.

Table 5. Impact of Appreciation on Tobacco

Exchange rate	Responsiveness	Tobacco			
		Inputs at old rate. Sales at 4500	Inputs and sales at 3500	Inputs and sales at 3500	Inputs and sales at 2500
Exporter Profitability		**Large commercial farmer (per ha)**			
Revenue ($)					
yield		2,400	2,400	2,400	2,400
price		$1.95	$1.95	$1.95	$1.95
revenue		$4,680	$4,680	$4,680	$4,680
Costs ($)					
imports (Fert. Chem. Fuel. R&M)	25%	$1,467	$1,467	$1,572	$1,760
Kwacha inputs Irrig. Curing. Contracts.	100%	$1,045	$1,045	$1,344	$1,881
labor costs (paid in Kwacha)	100%	$831	$1,068	$1,068	$1,496
Interest rate %	0%	15%	15%	15%	15%
interest costs (@ 15%)		$501	$537	$598	$771
total variable costs		$3,844	$4,117	$4,581	$5,908
capital costs		$599	$599	$599	$599
total costs		$4,443	$4,716	$5,180	$6,506
Profit Margin					
gross margin (revenue-variable costs)		$836	$563	$99	-$1,228
as % of turnover		18%	12%	2%	-26%
net profit (gross margin - capital costs)		$237	-$36	-$500	-$1,826
as % of turnover		5%	-1%	-11%	-39%

Assumptions: initial profit is 10% of turnover.

Source: Derived from ZNFU budgets

3.3.   Export Flowers

Floricultural exports expanded rapidly in the 1990s with the availability of capital loan funds, and achieved a peak of $42.1 million worth of exports in 1999. Since then there has been a decline to approximately $30 million worth in 2004/5, which is attributable to a downturn in international prices as a result of increased competition from suppliers in other countries. Those who managed to pay off their capital loan and have sustained production have done so through prudent management and efficient application of resources over several years. Approximately 4,000 workers are employed in the floriculture export industry at its current level of operation.

Since the collapse of Agriflora – a major horticultural exporter from Zambia – there has been a decline in to the tonnage of horticultural products air-freighted out of Lusaka. The significance of this for flowers is that the optimal balance between weight and volume, made up respectively of vegetables and flowers, has been lost, resulting in an increase in the rate payable for flowers alone. The number of air-freighters dedicated to the Lusaka route has fallen from five to one, so competitive pricing has fallen away. In response, many vegetable

exporters are now trucking their produce overland to Johannesburg for export via South Africa in order to take advantage of spare freight capacity and lower rates flying out of Johannesburg. This loss of air freight volume has compounded the pressure on local air freight rates, already under pressure from rising fuel costs. Zambia has the highest aviation fuel costs in the region. The flowers now face rates of between $2.17 and $2.20 per kg compared to the $1.75 paid previously.

Floriculture is highly capital intensive, requiring construction of green houses and cold rooms, the development of plant material and the training of staff. As a result, the ratio of variable costs to turnover must be low in order for the capital costs to be recovered. The enterprise is therefore sensitive to long term interest rates and requires prolonged sustainability to be viable.

Table 6 below shows the change in Dollar based costs due to appreciation. The resulting decline in net profit as a percentage of turnover – from14% at K4500 per $ to 9% at K3500/$ and -1% at K2500/$ – illustrates a significant fall in profitability.

Growers indicate that at a 3,500 exchange rate they will halt further investment, and at higher values they will begin disinvesting. All correspondents indicate the need for reduction in employment and that increases in wages cannot be accommodated. They are worried that there

Table 6. Impact of Appreciation on Floricultural Exports

		Floriculture		
Exchange rate	Responsiveness	*Inputs and sales at* 4500	*Inputs and sales at* 3500	*Inputs and sales at* 2500
Exporter Profitability				
Revenue ($)				
yield		3,500,000	3,500,000	3,500,000
price		$0.12	$0.12	$0.12
revenue		$420,000	$420,000	$420,000
Costs ($)				
imported inputs	25%	$185,940	$199,221	$219,144
local inputs (paid in Kwacha)	100%	$10,244	$13,171	$18,439
labor costs (paid in Kwacha)	100%	$16,275	$20,925	$29,295
Interest rate %	0%	15%	15%	15%
interest costs		$31,869	$34,998	$40,032
total variable costs		$244,328	$268,315	$306,909
capital costs		$115,588	$115,588	$115,588
total costs		$359,915	$383,902	$422,497
Profit Margin				
gross margin (revenue-variable costs)		$175,672	$151,685	$113,091
as % of turnover		42%	36%	27%
net profit (gross margin - capital costs)		$60,085	$36,098	-$2,497
as % of turnover		14%	9%	-1%

 Assumptions: initial profit is 10% of turnover.
Source: Derived from ZNFU budgets

will be a loss of export market opportunities to competitors in Kenya, Uganda, Tanzania and Zimbabwe with parallel losses of job opportunities for Zambians. They also anticipate an increase in freight costs as economies of scale are lost with recent reduction in horticultural exports and the declining number of air freight carriers serving Zambia. Zambia Export Growers' Association (ZEGA), foresees the defeat of the crop diversification strategy and consequently, greater reliance on copper.

The impact of VAT on inputs is diminished since the costs are reclaimable if the product is exported. Since there are no smallholder growers or outgrowers in the industry the VAT issue does not impact on the smallscale sector.

3.3.1. Impact on Flower Producers

Decline in the flower sector will be less severe than in other export sectors since the ratio of local to foreign based costs is very low, only about 10% of total expenditures. Therefore, rising Kwacha costs in dollar terms amount to only a small increase in overall expenditures. Profits fall but appear to remain positive. Given their large investments, most growers would remain in operation. However, there would be no further investment, and the less well-established growers who are facing heavy financing charges or are less efficient due to their logistical arrangements will be forced to cease operations. We project roughly a 5% fall in export earnings, resulting in a reduction on the order of $2 million with a corresponding employment reduction of approximately 200.

3.4.   Export Vegetables

Vegetable exports amount to 6,000 tonnes of exports valued at US$ 25 million net turnover in 2004/5 and with over 10,500 employees and 2,500 outgrowers. They are more dependent on labour than flowers, labour amounting to 22.5% of variable costs in vegetables compared with 4.5% in floriculture at K4500/$. While less capital intensive per unit of output than floriculture, it is nonetheless intensive due to the need for irrigation, cold-rooms and agricultural machinery. Capital costs for existing operations have been calculated at $8,000 per ha or $1,300 per tonne of capacity[2] which implies the need for a margin of 8% to cover capital financing costs alone. It is not possible to achieve this at K3,500 per $. Successful marketing is also built on considerable investment in gaining access and training of staff, which further increases costs of entry into the market.

There is a wide variety of crops in the sector with similar but varied cost structures. Analysis of the industry as a whole has been explored here to demonstrate the effects of appreciation in principle. This assessment indicates that positive returns at K 4500/US$ become strongly negative at K3,500/US$ (Table 7).

In the light of these indications, growers point out the need to improve productivity of labour through introduction of more piece work tasks and mechanisation. However, they point out that they have already rigorously searched for means to improve productive efficiency in the face of the challenge posed by increases in airfreight costs. There are, therefore, few options left for belt-tightening. Appreciation has favoured mechanisation by effectively increasing the

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[2] Variable costs per ha differ considerably from crop to crop and range from $1500 t0 $12,000 per ha in addition to the capital cost requirement.

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Table 7. Impact on Vegetable Exports in Principle

	Responsiveness	Imported Inputs at old rate. Sales at	Inputs and sales at	Inputs and sales at
Exchange rate		4500	3500	2500
Horticulture Exporters				
Revenue				
export revenues	0%	$25	$25	$25	$25
domestic sales				
Kwacha		11,250	11,250	11,250	11,250
$	100%	$2.50	$3	$3	$5
revenue		$28	$28	$28	$30
Costs ($)				
imported inputs (fertilizer, seed)	25%	$10	$10	$11	$11
local inputs (labor, transport, interest)	100%	$13	$15	$15	$18
total variable costs		$23	$26	$26	$30
capital costs	0%	$4	$4	$4	$4
total costs		$27	$30	$30	$34
Profit Margin				
gross margin (revenue-variable costs)		$5	$3	$2	$0
as % of turnover		17%	9%	7%	0%
net profit (gross margin - capital costs)		$1	-$1	-$2	-$4
as % of turnover		3%	-5%	-7%	-14%

Assumptions: initial profit is 10% of turnover.

cost of labour and, at the same time, decreasing the cost of imported machinery. However, the nature of horticulture provides very limited options for mechanisation and there are currently no significant options for economising through mechanisation. This implies that drastic cuts in the labour force are inevitable. Every job in the sector is at stake. Financial efficiencies, such as sidestepping local service providers and traders in favour of direct imports of inputs (including fuel) will be sought. They will also look to applying their resources to supplying the domestic market rather than exports but concede that the scope is limited to only one percent of the value of exports and that the labour required to serve only the domestic market is numbered in tens and not in thousands. One company says this would in fact imply reducing labour demand from 3,500 to 85. Clearly the challenge for competitiveness has been increased to the point where any laxity in management efficiency or frustrations such as power cuts, fuel shortages or labour disputes will seriously threaten the sustainability of export operations that have taken many years to establish.

Once the export markets are lost, they cannot be easily regained. Zambian exporters have taken years to establish their reputation as reliable export suppliers. Yet the supermarkets and large importers they serve can easily divert to other supply sources in the event the Zambian suppliers are unable to deliver. The global market place is highly competitive and ruthless in its selectivity. Non-performance for any reason brings an end to a supplier's access to the market. Companies are attempting to operate on a breakeven basis in anticipation of the return of a more favourable economic environment.

The impact of VAT is reduced for exporters of vegetables since they are able to reclaim it. Nonetheless it implies more administration costs and interest on loans while waiting for refunds to be effected. Sales of vegetables on the domestic market are subject to VAT, making

them uncompetitive with products from the informal sector that do not fall within the VAT net. This effectively deprives exporters of a remunerative outlet for export surpluses and rejects. The imposition of withholding tax on purchases from non-registered smallholders who are outgrowers to exporting companies would imply significant costs for outgrowers. As the initial budget law proposed, 45% should be deducted from sales by smallholders to the exporting company.

3.4.1. Impact on Horticultural Exporters

Returns to production turn negative at K3500/$ and will result in rapid large scale withdrawal from these hard-won export markets. These markets will not be regained without considerable investment and patient application of the best management methods over extended periods of time and under a stable and favourable exchange rate regime. The loss will therefore continue beyond the immediate period of Kwacha appreciation. We anticipate a 90% reduction in export earnings and employment, resulting in a fall of roughly $23 million in foreign exchange earnings and 11,700 employees losing their jobs.

3.5. Coffee

Zambia produces approximately 6,500 tonnes of high quality, washed Arabica coffee per annum valued at over $10.6 million in 2005. Approximately 60 commercial farms between Mbala in the north and Mazabuka in the south supply the bulk of this ouput. About 150 smallscale growers contribute about 1% of total production. The main impetus to coffee development has been the availability of funds under two loan agreements with donors, which is a vital component of growth in the industry since it is again highly capital intensive. The crop takes four years to develop fully and must be locally processed using costly equipment.
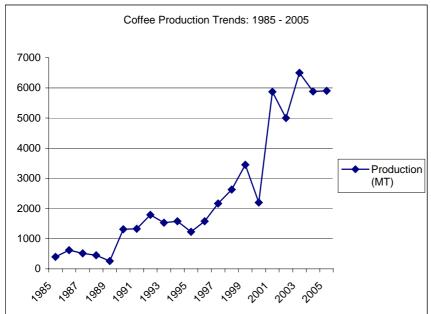
Figure 7. Coffee Production Trend in Tonnes

Source: Kasanga (2005)
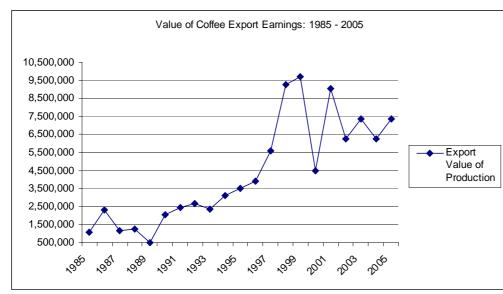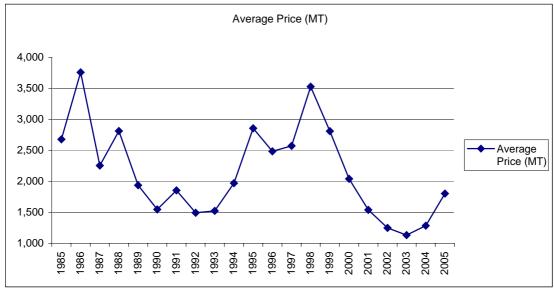
Figure 8. Coffee Export Earnings in US Dollars

Source: Kasanga (2005)

World coffee price variability has changed the fortunes of the sector over the years and it remains a volatile commodity as demonstrated above.

Units of at least 60 ha are economically efficient for commercial production under normal circumstances and require 40 permanent workers and up to 300 for harvesting and processing.

Figure 9. Average Coffee Price Trends Dollars per Tonne

Source: Kasanga (2005).

The Zambia Coffee Growers' Association (ZCGA) states that a permanent workforce of 47,000 is employed in coffee and another 120,000 pickers derive seasonal income, implying 830,000 dependents on the industry at its current scale. Manuals on coffee production in the region suggest that a workforce closer to 16,000 would be employed for 4 months on average to produce Zambia's output.

Three features of coffee production make it particularly vulnerable to exchange rate fluctuations and their impact on interest rates:
- it is heavily dependent on labour;
- its costs are predominantly incurred in Kwacha; and
- it requires long-term financing due to the three-year development period before current income exceeds current expenditure.

Dependence on labour can be reduced by using machinery to pick the crop, but this has major repercussions for the whole of Zambia's coffee. It is currently renowned as a quality product because it is hand picked, which means that only ripe beans are picked. Machine harvesting removes all the beans at the same time whether green, red or over-ripe, which means that the quality of the green bean final product is inferior and fetches a lower price. Once one grower in Zambia starts to harvest by machine the reputation of Zambian coffee as a quality product will be compromised – even for those who continue to harvest by hand. Therefore total returns to the country are reduced because the price premium is lost. However, under the new Kwacha valuation, conversion to machine harvesting is a strategy that is more likely to ensure economic survival than continued hand harvesting. That is, the individual enterprises could remain viable but the employment that they provide will be dramatically reduced. The table below shows average imputed variable costs in Dollars per tonne of green bean at the three selected exchange rates.

Given that the capital outlay is in the region of $5,500 per ha the gross margin implies a very long repayment period. Internal rates of return would be negative for figures below those indicated for the exchange rate of K4,500/$. Since yielding coffee represents considerable investment, it is all the more important to derive as much return from it as possible. It is not a crop that can be entered into and abandoned lightly, so growers will be looking urgently for a means to derive profitable income from it. One means of doing so under the conditions brought about by Kwacha appreciation is to invest in coffee harvesting machinery – a move that would represent a major shift for the worse in Zambia's position in the World coffee market and a severe blow to income earning opportunities of those employed seasonally to pick.

VAT on inputs is reclaimable since the crop is exported but the costs of administration and interest remain.

3.5.1. *Impact on Coffee Producers*

Returns to coffee will fall resulting in failure to repay loans and a strong tendency to mechanise. We project a reduction in export earnings of 10% or about $1 million (Table 8). On the other hand, employment will fall much further, by roughly 60%, as cost-reduction through mechanization leads to widespread redundancies. Mechanisation of picking will likewise result in a downgrading of all Zambia's coffee production since it will lose its reputation for fine quality, which is due to manual selective picking. All prospects for investment in the sector have disappeared at the current exchange rate of K3,100 per dollar.

Table 8. Impact of Appreciation on Coffee

		Coffee		
Responsiveness				
Exchange rate		4500	3500	2500
Exporter Profitability				
Revenue ($)				
yield (tonnes per ha)		1.41	1.41	1.41
price ($ per tonne)		1600	1600	1600
revenue ($ per ha)		$2,256	$2,256	$2,256
Costs ($ per ha)				
imported inputs Fert. Chem. Fuel. R&M	25%	457	$490	$548
Kwacha inputs. Irrig. Contracts	100%	385	$495	$693
labor costs (paid in Kwacha)	100%	283	$364	$509
Interest rate %	0%	15%	15%	15%
interest costs		$169	$202	$263
total variable costs		$1,294	$1,551	$2,013
capital costs	25%	$879	$941	$1,036
total costs		$2,172	$2,492	$3,049
Profit Margin				
gross margin (revenue-variable costs)		$962	$705	$243
as % of turnover		43%	31%	11%
net profit (gross margin - capital costs)		$84	-$236	-$793
as % of turnover		4%	-10%	-35%

Source: Derived from ZNFU budgets

3.6.   Sugar

Zambia's yield potential in sugar is among the best in the world due to our climate, but that potential is far from fully exploited. More than 248,000 tonnes are produced annually of which more than half is exported at a value of over $65 million, including 28,000 to the EU under the privileged quota system, and at least 16,000 to SACU countries and another 16,000 to other regional markets at the ruling world market price. The domestic market has absorbed 120,000 tonnes per annum in the past, earning in excess of K300 billion. Since harvesting is still done manually the crop provides formal employment to 26 people per 1000 tonnes of production and some additional production is derived from outgrowers, implying that about 6,500 people derive income directly from field production alone.

The high proportion of costs attributable to wages indicates the sensitivity of local sugar production costs to appreciation of the Kwacha. Not only has the cost of export production (in Dollar terms) risen due to high labour costs, but the sugar industry has been hit from a second angle. Because the import parity price of sugar has fallen in Kwacha terms, imports are increasingly competitive with domestic production.

The significance of these two Kwacha-induced competitive pressures is illustrated by the sudden rise in sugar smuggled into Zambia from neighbouring countries since the appreciation. Sales of Zambian sugar in Chipata, for example, have fallen from between 800 and 1000 tonnes per month to a mere 120 tonnes, and prices have dropped from $800 per tonne to $420 per tonne, seriously undermining profitability. This is because the Malawian product has become comparatively cheaper, so Zambia has effectively transferred the income earning opportunities provided by feeding the home market from Zambians to Malawians.

Although it has not been specifically mentioned by sugar growers, the prospect of converting to mechanical harvesting systems such as are already employed on cane sugar in Australia and Mauritius, for instance, must have come much closer due to appreciation.

The addition of VAT to production inputs has further diminished competitiveness of Zambian sugar on the domestic market. VAT will be reclaimed on the portion of production that is exported (Table 9). Returns to outgrowers will be reduced by 45% due to Withholding Tax unless they are registered for tax purposes or provisions are made for outgrower schemes.

Table 9. Impact of Appreciation on Sugar

Crop			Sugar		
				Inputs and sales at	Inputs and sales at
	Responsiveness			no VAT / VAT	
Exchange rate		4500	3500	3500	2500
Sugar Production and Export					
Revenue					
export revenues	0%	$70	$70	$70	$70
domestic sales					
Kwacha	100%	189,000	147,000	121,275	105,000
$	100%	$42.00	$42	$35	$42
revenue		$112	$112	$105	$112
Costs ($)					
imported inputs (fertilizer, seed)	25%	$18	$19	$22	$20
local inputs (labor, transport, interest)	100%	$72	$88	$88	$104
total variable costs		$90	$107	$110	$123
capital costs	0%	$8	$8	$8	$8
total costs		$98	$115	$118	$131
Profit Margin					
gross margin (revenue-variable costs)		$22	$5	-$5	-$11
as % of turnover		20%	5%	-5%	-10%
net profit (gross margin - capital costs)		$14	-$3	-$13	-$19
as % of turnover		13%	-2%	-13%	-17%

3.6.1. Impact on Sugar Growers

Zambia has lost its competitive advantage on the world market and has already encountered massive invasion of the domestic market through smuggled product from the region. The result will be cancellation of investment plans, tendency to mechanise and to seek service contracts with foreign suppliers at the expense of local contractors. Reductions of 20% of exports, amounting to a foreign exchange loss of $13 million, and of 85% of domestic market share, or about $36 million, could result, with losses of employment opportunities of about 6,000 in total.

3.7.　Paprika

Paprika is an industry with similarities to the cotton industry in its structure and dependence on outgrowers who receive seed and extension advice from the parent company. It currently generates about $1 million in foreign exchange earnings through 3,000 outgrowers, although in the recent past it has reached $3.5 million with more than 6,000 outgrowers. Five major commercial growers also produce paprika. They employ 150 permanent workers for their paprika operations with over 100 employed in processing. In the recent past there were 30 commercial growers.

Table 10. Impact of Appreciation on Commercial Paprika Production

Crop		*Paprika*		
		Inputs at old rate. Sales at	*Inputs and sales at*	*Inputs and sales at*
Exchange rate	Responsiveness	4500	3500	2500
Large scale producer profitability				
Revenue ($)				
yield		2.5	2.5	2.5	2.5
price		$1,000	$1,000	$1,000	$1,000
revenue		$2,500	$2,500	$2,500	$2,500
Costs ($)				
imported inputs	25%	$794	$794	$850	$952
local inputs (paid in Kwacha)	100%	$202	$202	$259	$363
labor costs (paid in Kwacha)	100%	$365	$469	$469	$657
Interest rate %	0%	15%	15%	15%	15%
interest costs		$204	$220	$237	$296
total variable costs		$1,564	$1,684	$1,816	$2,268
capital costs	50%	$513	$586	$586	$704
total costs		$2,077	$2,271	$2,402	$2,972
Profit Margin				
gross margin (revenue-variable costs)		$936	$816	$684	$232
as % of turnover		37%	33%	27%	9%
net profit (gross margin - capital costs)		423	$229	$98	-$472
as % of turnover		17%	9%	4%	-19%

Source: Derived from ZNFU budgets

3.7.1. Commercial Growers

Table 10 illustrates the effect of the Kwacha appreciation on commercial paprika production. Profitability is severely reduced and becomes negative at just below K3500 per $.

One outgrower company states that the potential for expansion would provide income to 8,000 smallholders and 30 commercial growers with 750 ha and 1000 full time jobs and another 200 in processing. The industry has in the past experienced cash flow difficulties associated with over rapid expansion, which have made some growers wary of involvement. Exports could reach 4000 tonnes worth $5 to 6.5 million, but under the current Kwacha value such expansion is not attractive. Indeed, since outgrowers are already exiting the paprika industry, it is highly improbable that they would enter into an agreement to grow at a Kwacha price that would have to be reduced by 22% for an exchange rate of K3,500 per $, and even less so at 44% for K2,500/$.

3.7.2. Smallholder Outgrowers

The profitability of a smallholder outgrower is shown in Table 11 on the assumptions that lower yields and lower price are achieved due to lower inputs and management. Inputs are also increased by 17.5% due to VAT. Since smallholders are unlikely to be tax registered they would also be charged 45% Withholding Tax, which is not shown in this table but would make the production of paprika by smallholders non-profitable. Although there is a decline in the Kwacha return per labour-day the Dollar denominated rate declines by only 14% once the new input prices become effective. The intermediate season (2005 – 06) shows a real decline because inputs would have been purchased at the high rate and out put sold at the low rate

Table 11. Impact of Appreciation on Smallholder Paprika Production

Paprika Outgrower profitability		Inputs at old rate. Sales at	Inputs and sales at	Inputs and sales at
Exchange rate	Responsiveness	4500	3500	3500	2500
Revenue					
farmgate price (USD/tonne)		$850	$850	$850	$850
farmgate price (K/kg)	100%	3,825	2,975	2,975	2,125
yield (kg/ha)		600	600	600	600
revenue		2,295,000	1,785,000	1,785,000	1,275,000
Costs					
purchased inputs (USD/ha)	25%	$220	$220	$236	$242
purchased inputs (Kwacha/ha)	100%	990,000	990,000	825,000	605,000
labour days (person days/ha)	0%	100	100	100	100
Profit margin					
gross margin		1,305,000	795,000	960,000	670,000
capital costs		67,121	52,205	52,205	37,289
net profit		1,237,879	742,795	907,795	632,711
returns to labour (K per day)		12,379	7,428	9,078	6,327
returns to labour ($ per day)		2.75	2.12	2.59	2.53

3.7.3. Impact on Paprika Producers

Margins to producers fall but they still remain profitable. We have been unable to assess the impact on marketing companies, however. If the export companies are able to survive, there will be very little reduction in export production of paprika. In fact, this sector could attract growers from other export sectors harder hit by the appreciation.

3.8. Honey

Last year, two companies operating in North-Western Province exported 520 tonnes of honey and 30 tonnes of bees wax, earning just over $1,000,000 in foreign exchange and providing one of the major sources of income to 10,000 poor rural households in that province.

Since all the expenditure entailed in the enterprise is composed of labour and other local costs and there is no scope for raising the export price, the impact of appreciation is directly proportional to the appreciation. A permanent Kwacha strengthening to 3,500 converts current meagre profitability to a loss and therefore heralds closure of the export enterprise unless measures can be taken to mitigate the impact of the rising Kwacha. The local market would support only 800 growers and would not merit the operation of the export business because economies of scale would be lost. Expansion of the business has entailed borrowings which will not be repayable under the current exchange rate.

The added impact of Withholding Tax on the honey growers themselves would entirely eliminate the business unless purchases of less than K200,000 were to be made at each transaction.

3.8.1. Impact on Honey Producers

Since costs are almost exclusively Kwacha-based, the effects of appreciation are highly damaging to producer incomes. The export enterprise becomes unprofitable at Kwacha valuation of K3500 unless producer prices are lowered in line with appreciation. The income earning opportunities for rural communities will be reduced in Kwacha terms but remain the same in Dollar terms. Some producers will no longer be willing to sell at the ruling Kwacha denominated but dollar related price and will therefore cease production. We estimate a 20% reduction in export earnings to $800,000 and that 2,000 producers will forego their principal source of cash income.

3.9. Conclusions on Impact on Agricultural Exports

In general, all exporters face a decline in the Kwacha value of the foreign currency derived revenues in direct proportion to the change in exchange rate of the Kwacha. The effect of this on the viability of their enterprise depends on the extent to which they are dependent upon Kwacha-based expenses. Where these are not reduced in line with Kwacha appreciation, as in the case for example of labour, the effects of appreciation are more damaging. Where their costs are more foreign exchange based, as with overseas marketing or imported capital equipment, the effects are less damaging. For this reason, floriculture remains comparatively insulated from the effects of a Kwacha appreciation while the profitability of export honey production is highly sensitive to exchange rate effects (Figure 10).

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As profits fall, exporters and farmers face pressures to reduce costs in order to remain viable. Given that labour constitutes the major Kwacha cost element for many farmers, these efforts often involve mechanization or other methods of reducing employment. Where the scope for cost reduction remains limited, farmers and exporters indicate they will be forced to withdraw from these agricultural export activities and redeploy their capital and labour in other economic pursuits. The following discussion attempts to summarize the likely response of farm and agribusiness groups to the profit squeeze imposed by the recent Kwacha strengthening.
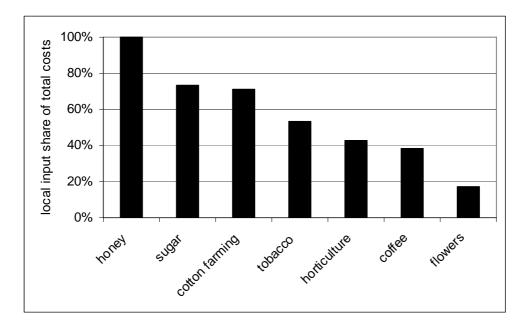
Figure 10. Local Input Share in Total Cost

4. ECONOMIC IMPACT ON DOMESTIC MARKET CROPS

The impact of appreciation on enterprises for domestic consumption is broadly similar for all crops, so maize and wheat are analysed here as examples of crops with respectively low and high capital outlay per unit of output. Soya is affected in the same way as maize except that the two major end products used in Zambia – oil and cake – are subject to complex interactions with alternative substitutes and supply sources. Maize production is an enterprise of great significance for smallholders, while wheat falls purely in the commercial farming sector. Both crops are grown within the wider Southern and Eastern African region and are traded between countries with increasing frequency and with increasing ease since the provisions of regional trade agreements have lowered trade barriers.
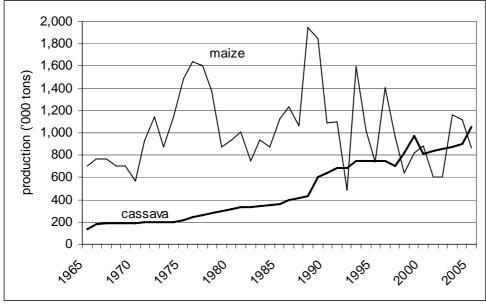
The imposition of VAT on inputs has increased costs of production of maize which remains an exempt product. Wheat and other domestic crops are standard rated which allows for input VAT to be reclaimed.

4.1. Maize

4.1.1. Imports and Import Parity Prices

Maize, being the staple food crop of Zambia, is of major importance to the agricultural production sector and to the economy as a whole. The majority of the crop is produced by smallholders on low-input, low-output systems that are drought prone and not sustainable in the long run without encroaching on virgin land, unless they have adopted conservation farming methods. When the rains are advantageous for production, Zambia usually achieves self-sufficiency and sometimes a small surplus. But when the rains are not advantageous there is a shortfall and imports are needed.

Figure 11. Trends in Staple Food Production in Zambia

Source: FAOSTAT

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Over the past decade and a half, maize production has trended downwards. At the same time, as a result of the reductions in the large-scale marketing and input subsidies for maize, production of other food crops, such as cassava, has become increasingly attractive (Figure 11).

Imports have likewise become increasingly competitive. Domestic prices spike above import parity with increasing frequency (Figure 12). As a result, Zambia has tended to import more frequently. Indeed, a by-product of Zambia's highly successful crop diversification policy has been that maize imports will become an increasingly permanent feature of the liberalized and outward oriented Zambian economy.

A permanent strengthening of the Kwacha will make imported maize and wheat even more competitive in the future than in the past. As Figure 13 indicates, a hypothetical 30% appreciation in the Kwacha during the past six years would have made maize imports profitable more frequently and for longer periods than in the past. Import prices, rather than falling below domestic prices for an average of roughly one month per year would become profitable for closer to four months at a stretch, during the lean season. This suggests significantly larger maize imports –on the order of 200,000 tons per year – as well as downward pressure on maize prices and therefore farmer production incentives. The foreign exchange cost of this shift would be in the range of $60 to $80 million per annum and would imply a reduction in domestic production of up to 20% with associated loss of income earning opportunities for rural communities.
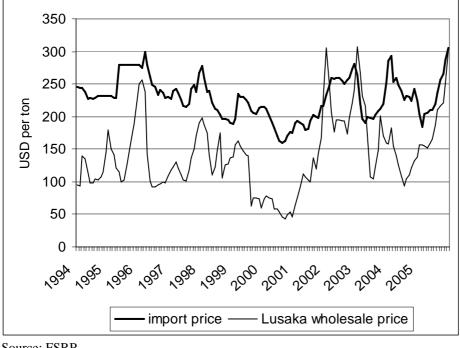
Figure 12. Trends in Domestic and Import Prices of White Maize

Source: FSRP
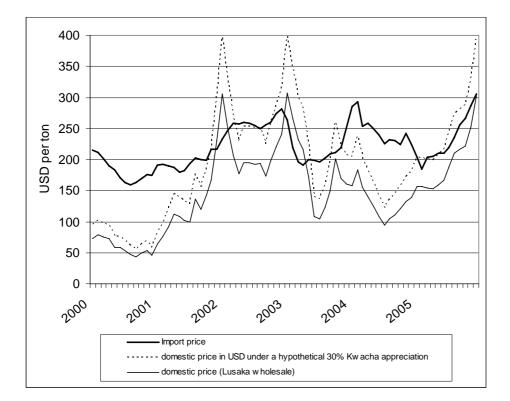
Figure 13. Changes in Import Profitability of White Maize under a Kwacha Appreciation

Thus, a strengthening Kwacha affects not only the cost of inputs, but also the price of maize itself. In the following calculations, we estimate that a permanent strengthening to 3,500 will result in four months of imports and a lowering of average annual maize prices on the order of 15-20%.

Maize is exempt for VAT purposes, meaning that, although no VAT is chargeable on sale of the crop, the VAT component of input costs cannot be reclaimed and therefore add directly to the costs of production and hence to consumer price. If VAT is maintained on inputs, it will further damage the competitiveness of Zambian maize production within the region and promote imports over domestic production.

4.1.2. *Commercial Maize Production*

Commercial production is more dependent on imported inputs and equipment than smallscale production but is more robust when challenged by drought. There is an increasing tendency towards early production of maize where irrigation allows for early planting and access to drying equipment permits early harvesting. This production regime permits rotation with wheat within the same year but would not be economical as a stand alone enterprise.

Harvesting methods on commercial farms are tending away from labour intensive systems towards combine harvesting where economies of scale permit. The shift in the relative costs of labour and machinery, such as accompanies appreciation of the Kwacha, promotes the tendency toward mechanical harvesting.

Analysis of the impact of appreciation of maize is made in Table 12 in terms of Kwacha since it is sold in Kwacha on the domestic market. In the second part of the analysis the economics of production is viewed in the context of the import parity price. It is assumed that the Dollar equivalent price of maize remains constant and so the producer price in Kwacha will fall. The table shows the changes in input prices in Kwacha following appreciation for commercial producers using the three selected exchange rates with and without VAT on inputs. Input prices do not fall in parallel with the appreciation of the Kwacha because of local cost components as explained in chapter 2.

It is assumed that the interest rate charged on agricultural loans will fall as a result of reductions in inflation following appreciation. Although press statements claim that interest rates are falling at commercial banks, the cost of borrowing is remaining constant in percentage terms since bank charges are increased as interest rates are reduced. This reflects the perception in banking circles that agriculture has become more risky as a result of appreciation. Reductions in interest rates applied to this model therefore reflect an optimistic view.

The current crop under production is treated separately (in Column B) since the inputs were purchased at the higher exchange rate and the output will be sold under a lower one – albeit in Kwacha. The next season's crop, 2006-07, will be planted with inputs on which VAT is charged (Column D). Columns C and F do not include VAT. The model demonstrates the effect on maize harvested mechanically, which would be the most optimistic scenario. Manually harvested maize would reveal a worse picture.

The inclusion of annual flow of capital costs converts a small positive gross margin into a loss and helps to explain why Zambia's tractor fleet has an average age that far exceeds optimal efficiency. This is also why Zambian maize growers will not be in a position to take advantage of the high Kwacha value to import new machinery.

Net profit as a percentage of turnover declines and becomes negative in columns B, C and F due to input costs not reducing in parallel with appreciation of the Kwacha. The bottom row of the table shows the Dollar price for maize required to provide breakeven at the given yield, i.e. zero return to management. The breakeven price in Dollars increases with the appreciating Kwacha, tending towards import parity price.

The current import parity price of $323 is exceptionally high due to transport congestion and high oil prices. Import parity prices effectively form a cap on domestic prices since millers would tend to import if that proved cheaper than purchasing domestically. Appreciation acts on the prevailing price of maize by lowering the import parity price in Kwacha terms, or by raising the cost of domestic production in Dollar terms. In either case, appreciation has increased the propensity to import, as described above.

Table 12. Impact of Appreciation on Domestic Production of Maize

Crop		*Maize*					
		Old rate	Inputs at old rate. Output at new rate	Inputs and Output at new rate	VAT on inputs at new rate	VAT on inputs at:	No VAT
		A	B	C	D	E	F
Exchange rate		4500	3500	3500	3500	2500	2500
rge commercial farms							
	Responsiveness						
Revenue (Kwacha)							
yield		5.5	5.5	5.5	5.5	5.5	5.5
price $		$220	$220	$220	$220	$220	$220
price Kwacha	100%	990,000	770,000	770,000	770,000	550,000	550,000
revenue		5,445,000	4,235,000	4,235,000	4,235,000	3,025,000	3,025,000
Costs (Kwacha)							
imported inputs (R&M)	75%	174,038	174,038	145,032	170,412	160,674	113,953
imported inputs (Land prep. Harv. Trans.)	50%	839,241	839,241	745,992	876,541	845,236	639,422
Kwacha inputs (Seed. Chem. Fert. Bags)	25%	1,868,055	1,868,055	1,764,274	2,073,022	2,038,181	1,638,255
Kwacha paid (lab, insurance, council)	0%	285,811	285,811	285,811	285,811	285,811	285,811
interest rate (assumed)	-75%	29%	23%	23%	23%	16%	16%
interest costs		918,472	721,657	670,153	776,033	531,119	427,052
total variable costs		4,085,617	3,888,802	3,611,261	4,181,819	3,861,022	3,104,493
capital costs	75%	917,933	917,933	764,944	898,810	847,449	764,944
total costs per ha		5,003,550	4,806,735	4,376,206	5,080,628	4,708,471	3,869,437
total costs per tonne		769,777	739,498	673,262	781,635	724,380	595,298
Profit Margin							
gross margin (revenue-variable costs)		1,359,383	346,198	623,739	53,181	-836,022	-79,493
as % of turnover		25%	8%	15%	1%	-28%	-3%
net profit (gross margin - capital costs)		441,450	-571,735	-141,206	-845,628	-1,683,471	-844,437
as % of turnover		8%	-14%	-3%	-20%	-56%	-28%
Breakeven price in Dollars per tonne		**$202**	**$250**	**$227**	**$264**	**$342**	**$281**

Source: Derived from ZNFU production budgets

4.1.3. *Smallholder Maize Production*

Smallholder production is analysed below in the same way except that it is assumed that the producer price is lower than the commercial producer price due to isolation and because labour is not paid, therefore the net revenue is the farmers' income from production (Table 13). A commercial interest rate has been applied that reflects the opportunity cost of funds. The rate applied here of 29% is in reality far below the opportunity cost of cash in most rural areas where informal loans are made at interest rates of 100%. It is assumed that the rate will decline, as in the case of the commercial producers.

A yield of three tonnes per ha is assumed although this is above average for smallholder production. The return to labour remains below K5,000 per day at all exchange rates and will be negative this season under the assumptions applied here.

The Dollar producer price required to provide an income of $1.50 per day increases dramatically with the imposition of VAT and the appreciating Kwacha. The VAT is not recoverable by either smallholders or commercial farmers in maize production. Withholding

Tax should also be deducted from the producer price for transactions over K1,500,000, but the effects of this are devastating to profitability and are not shown here.

The fact that the price required to provide $1.50 return to a labour day is so much higher than the prevailing price confirms the reasons for rural poverty. In this model a yield of 3 tonnes per ha has been assumed but, bearing in mind that actual average yields are only 1.4 tonnes per ha., (including all commercial production which yields over 5 tonnes per ha.) it is clear that there are many households whose returns to labour are pitifully low. It also explains why food aid has become a recurrent feature of Zambia's food security position. The imposition of Withholding tax on sales above K1,500,000 in lieu of 3% Turnover tax is a further injury to the rural poor whose transaction costs in recovering it would make the effort not worthwhile. Even the 3% turnover tax on this year's crop only exacerbates the loss and far exceeds the income tax rate imposed on even Zambia's most wealthy citizens.

If the import parity price of $323 were to be paid to smallholder producers it would provide an income of K 13,600 per man day under the assumptions applied here with an exchange rate of K3500.

Table 13. Impact of Appreciation and VAT on Commercial Smallholder Maize Production

Crop		Maize					
		Old rate	Inputs at old rate. Output at new rate	Inputs and Output at new rate	VAT on inputs at new rate	VAT on inputs at:	No VAT
		A	B	C	D	E	F
Exchange rate		4500	3500	3500	3500	2500	2500
Small farms							
Revenue	Responsiveness						
yield		3	3	3	3	3	3
price (USD/tonne)		$323	$323	$323	$323	$323	$323
price (K/tonne)	25%	1,453,500	1,130,500	1,130,500	1,130,500	807,500	807,500
revenue		4,360,500	3,391,500	3,391,500	3,391,500	2,422,500	2,422,500
Costs							
imported inputs	50%	135,000	135,000	120,000	141,000	135,964	60,000
local inputs (Kwacha)	25%	1,586,835	1,586,835	1,498,678	1,760,946	1,731,350	1,124,008
Levy	0%	43,605	33,915	33,915	33,915	24,225	24,225
Interest rates	-75%	29%	23%	23%	23%	16%	16%
interest costs		511,978	400,060	376,555	441,100	301,701	192,713
total variable costs		2,277,418	2,155,810	2,029,148	2,376,961	2,193,240	1,400,946
capital costs		61,587	61,587	61,587	72,365	72,365	72,365
total costs		2,339,005	2,217,397	2,090,735	2,449,326	2,265,605	1,473,311
total costs per tonne		359,847	341,138	321,651	376,819	348,555	226,663
Profit Margin							
gross margin (revenue-variable costs)		2,083,082	1,235,690	1,362,352	1,014,539	229,260	1,021,554
returns to labour K/man-day	100	20,831	12,357	13,624	10,145	2,293	10,216
returns to labour $/man-day		$4.63	$3.53	$3.89	$2.90	$0.92	$4.09
net profit (gross margin - capital costs)		2,021,495	1,174,103	1,300,765	942,174	156,895	949,189
as % of turnover		46%	35%	38%	28%	6%	39%
Dollar price to give $1.50 per day return to labour		**$217**	**$254**	**$242**	**$276**	**$343**	**$236**

Source: Derived from ZNFU production budgets

4.2. Wheat

Wheat in Zambia is produced only under irrigation and production capacity therefore implies heavy capital investment in water harvesting infrastructure, irrigation equipment as well as combines, planters, tractors cultivation, spraying, storage and drying equipment. While government has been supportive of the development process by imposing a 15% import duty on wheat to raise import parity price there remains, nonetheless, the need to borrow capital funds to invest in wheat production. This means that fixed costs are a much higher proportion of total production costs than in the case of rainfed crops. Also, loans incurred in Kwacha are severely affected when appreciation occurs since the nominal Kwacha amount remains owing but its value in terms of the price index is increased.

The analysis of costs of production of irrigated wheat in Zambia under the three selected exchange rates shows the increasing cost of production in Dollars per tonne while the cost in Kwacha declines due to appreciation (Table 14).

Table 14. Impact of Appreciation on Zambian Wheat Production

Crop		Wheat		
Exchange rate	Responsiveness	4500	3500	2500
Revenue (Kwacha)				
yield		6.5	6.5	6.5
price $		$300	$300	$300
price Kwacha	100%	1,350,000	1,050,000	750,000
revenue		8,775,000	6,825,000	4,875,000
Costs (Kwacha)				
imported inputs (R&M)	75%	989,497	824,581	659,665
imported inputs (Land prep. Harv. Trans.	50%	2,761,065	2,454,280	2,147,495
Kwacha inputs (Seed. Chem. Fert. Bags)	25%	285,913	306,335	343,096
Kwacha paid (lab, insurance, council)	0%	285,913	285,913	285,913
interest rate (assumed)		29%	25%	22%
interest costs		1,253,493	967,777	755,957
total variable costs		5,575,881	4,838,886	4,192,125
capital costs	50%	2,738,977	2,434,646	2,086,840
total costs per ha		8,314,857	7,273,533	6,278,965
total costs per tonne		1,279,209	1,119,005	965,995
Profit Margin				
gross margin (revenue-variable costs)		3,199,119	1,986,114	682,875
as % of turnover		36%	29%	14%
net profit (gross margin - capital costs)		460,143	-448,533	-1,403,965
as % of turnover		5%	-7%	-29%
Breakeven price in Dollars per tonne		**$284**	**$320**	**$386**

Source: Derived from ZNFU budgets.

Wheat is standard rated for VAT so farmers can reclaim VAT on inputs and equipment and must charge VAT on sales of the wheat. The interest on VAT is a consideration in the production costs and the need to pay VAT on equipment, albeit reclaimable, means that more initial capital is required to establish production capability.

The analysis does not distinguish between the upcoming season and subsequent seasons since it is assumed that inputs will be purchased in April and May at the same exchange rate as that prevailing when the crop will be sold in September to November. The interest on VAT is also not included. The table reveals a negative return at the rate of K3500 and below with a need for a Dollar price of $320 at K3500 and $386 at K2500 per Dollar. At the current import parity price of $429.66[3] per tonne cif Lusaka, domestic producers would be able to gain net profit of 28% at a Kwacha valuation of K3,500 per $.

The major impact for those with Kwacha loans is the real increase in indebtedness in relation to Kwacha earnings. Even if the slowdown in the rate of inflation were to bring the interest rates down as assumed in the table above, the value of the loans in Dollar terms will have been increased by appreciation. The implication for wheat growers with loans is that they will become more deeply indebted through no fault in their own management. Although the cost of imported irrigation and harvesting equipment will be reduced, this will not have the same impact as the reduction in import parity price in Kwacha terms.

4.2.1. *Import Parity and Wheat Flour*

A significant factor for the wheat industry in Zambia is that it can be produced in the winter rainfall areas of Tanzania and South Africa more cheaply, although at lower yields per ha., than in Zambia since no irrigation is required. The import parity price is therefore a concern as import barriers are lowered and costs of transport are reduced through improvements to communications (Table 15). Furthermore, wheat is only a raw material for the milling industry and wheat flour is an equally tradable commodity with higher value-weight ratio that is imported into Zambia from various sources. Some of these are derived from SADC or COMESA countries which can convey "origin" status by simple milling of wheat imported from low-cost or subsidised sources, thereby avoiding import duty in Zambia. In this case the import parity price of flour poses a challenge to the local industries as local costs of production and processing increase with appreciation.

The protection afforded to the local industry in Lusaka at K3500/$ is already slender and is owed to the abnormally high transport costs currently prevailing. Imports of flour to the Eastern and Northern Provinces are already at lower cost than Zambian product in those areas due to imports from Malawi and Tanzania respectively. This erodes the market for domestic production and processing. The effect at the current pre-planting planning stage in 2006 has been to resist commitments of more than $300 per tonne by millers to farmers – a price that does not cover annualised capital costs nor does it reward management input.

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[3] Import parity price includes duty at 15%, bagging and handling at US$ 13.00 per tonne, insurance at 1% and clearing at 1.5%. It excludes 17.5% VAT.

Table 15. Import Parity Prices of Wheat Flour

Wheat source	Mill location	Flour cost $/MT
Zambia[1]	Zambia	442
External [2]	Zambia	565
World market via Nacala	Malawi	449
World market via Beira	Malawi	486
SADC	Swaziland	464
World market	Mauritius	466
World market	Madagascar	479
World market	Mozambique (non-COMESA)	490
World market	Namibia (non-COMESA)	525
Tanzania	Tanzania (non-COMESA)	483
SADC	Lesotho (non-COMESA)	560

Source: Derived from Annexed Table from Millers' Association of Zambia.
1. Assumes breakeven cost of production at K3500/US$ is $310 per MT.
2. Includes 15% duty on imported wheat.

4.3. Livestock Sector

Costs of production in the livestock sector are affected in the same way as crops in that local costs are not reduced in parallel with the exchange rate and costs of imported inputs are reduced to a lesser extent than the exchange rate. Therefore in Dollar terms the costs of production are increased. This implies that exported products are less competitive on the international or regional markets and that imported finished products are more competitive.

For example, the local *producer* price of milk is K1400 per litre but at the current exchange rate of K3,300 per dollar imported UHT milk is being *retailed* at K1200. Milk is increasingly a smallholder product so the impact on income generating opportunities is significant and will reduce or reverse the rate of expansion of small-scale and large-scale production on which over 3000 smallholder producers depend for a living.

The effects of appreciation are also felt in the poultry sector in which over 800,000 households are involved at some level. Locally produced stock-feed will not decline in price in parallel with exchange rates but the competition from imported birds from regions where economies of scale are significant will be more intense. Decline in profitability is compounded by discrimination against small-scale producers by the imposition of VAT, as described below.

The poultry industry is dominated by smallscale producers who purchase 60% of the day-old chicks, as opposed to 30% by large-scale farmers. (The remaining 10% of the chicks are exported). The poultry industry forms a vital component of the protein diet for the low-income sector of the community and a source of income to 43,300 smallscale producers.

The financial structure of the poultry sector is similar for both eggs and broilers, so the effects demonstrated here for broilers is equally applicable to eggs and indeed to the whole livestock sector, although levels of input vary.

Under the current VAT classification livestock inputs and products are standard rated and therefore the consumer should pay the added cost of VAT on output while the registered producer is able to reclaim VAT on inputs.

However, if the seller is not registered for VAT and sells in the informal market, he will not charge output VAT. This means that he will have a producer price advantage over the registered producer even though he will not be able to reclaim VAT on inputs. It also creates a strong incentive for producers to sell informally and avoid output VAT. This implies unregulated marketing just at a time when greater vigilance and control is required in the context of the threat from bird flu.

Registered growers are able to reclaim the VAT on inputs but are obliged to charge VAT on output. In order to remain competitive with unregistered growers by selling at the same market price, they will have to absorb the VAT. This makes the enterprise unprofitable and will result in large scale swing in production from the formal to the informal, unregulated sector. In the view of the Zambia National Farmers Union this would be highly irresponsible in the light of current bio-security issues.

The standard rated case is illustrated in the table below for costs and returns per bird showing that:

- Unregistered growers have a market price advantage;
- Profits for registered growers fall to unsustainable levels when poultry products are standard rated.
- Total revenue to ZRA will fall as production tends toward the informal sector.

The central columns of Table 16 illustrate the disparity between registered and non-registered producers when inputs are exempt since registered farmer profits will fall to only 20% of registered farmer profits. The smallholder production (the majority) remains outside the VAT net.

Table 16. Contrasting VAT Scenarios in Poultry Production

	2006 Budget Chickens standard rated				Chickens standard rated Inputs exempt				Chickens Exempt Inputs standard rated			
	Registered Producer		Unregistered Producer		Registered Producer		Unregistered Producer		Registered Producer		Unregistered Producer	
	Cost K	*VAT K*	Cost K	*VAT K*	Cost K	*VAT K*	Cost K	*VAT K*	Cost K	*VAT K*	Cost K	*VAT K*
Feed	6,100	*1,068*	6,100	*1,068*	6,100		6,100		6,100	*1,068*	6,100	*1,068*
Chick	2,780	*487*	2,780	*487*	2,780		2,780		2,780	*487*	2,780	*487*
Vatable overhead	400	*70*	400	*70*	400	*70*	400	*70*	400	*70*	400	*70*
Non Vatable overhead	1,300		1,300		1,300		1,300		1,300		1,300	
Total cost (excl. VAT)	10,580	*1,625*	10,580	*1,625*	10,580	*70*	10,580	*70*	10,580	*1,625*	10,580	*1,625*
VAT Not recoverable	0		1,625		0		70		1,625		1,625	
Total Cost	10,580		12,205		10,580		10,650		12,205		12,205	
Producer price	**11,064**		**13,000**		11,064		13,000		13,000		13,000	
VAT on output	1,936		0		1,936		0		0		0	
Profit	**484**		**796**		484		2,350		**796**		**796**	
Producer pays to ZRA	312		0		1,866		0		0		0	
Suppliers pay ZRA	1,625		1,625		70		70		1,625		1,625	
Total received by ZRA	**1,936**		**1,625**		**1,936**		**70**		**1,625**		**1,625**	

If chickens are exempt and stockfeed and chicks are standard rated, as recommended and shown in the right hand columns, there is equality between registered and non-registered growers but profit margins are very low unless the consumer is to pay the added price.

Since livestock products are important sources of protein and because they are produced predominantly by the smallscale farming sector, the better condition is that they are exempt at both input and output level or preferably that they are zero rated. Zero rating also limits incentives to market livestock through informal channels, where VAT and withholding taxes are not imposed and where sanitary controls are less stringent. Given current concerns about the spread of poultry and livestock diseases, reversion to the zero VAT rating would facilitate current efforts at livestock disease control.

The examples above relate to broiler production but the same conditions, with different costs and returns, are equally relevant to milk and beef production. They are also important sources of protein. Smallscale producers provide 70% of the meat to the market, and milk is increasingly produced by smallscale farmers.

The full effect of standard rating on livestock products is a 9.4% increase in consumer price of meat and a 14.2% increase in the price of fresh milk resulting from a 3.5% increase in producer price to cover additional costs attributable to VAT and to increased consumer price due to output VAT.

4.4. Conclusions on Impact on Domestic Production.

Although this analysis has covered only maize and wheat in detail, the impact on other rainfed crops and livestock is similar to that of maize. On the positive side it means that farmers have the opportunity to replace their capital equipment at less cost than before, although few have funds available to do so, and there will be reductions in some of the costs of production, although not in parallel with the appreciation. The overall negative impact is that Zambian production becomes less competitive and therefore vulnerable to imports, thereby undermining the years of effort and investment in achieving self-sufficiency, import substitution and poverty alleviation.

Overall costs of production do not move down, as a result of appreciation, in direct proportion to the rise in value of the Kwacha because local input prices are not significantly reduced, as discussed in Section 2.3. However, in Kwacha terms the cost of imports has converged markedly with domestic production costs, particularly in the case of wheat flour.

This situation has become more pronounced as a result of the imposition of VAT on supplies, even though the VAT is recoverable except in the case of maize for commercial farmers and all other enterprises for smallholders.

Table 17 indicates that higher Kwacha valuation favours importation over domestic production except in the case of wheat. Smallholder maize production, under which smallholders earn only K5,000 per day worked and produce yields of 3 tonnes/ha (much higher than average), can be less disadvantaged at higher Kwacha valuations. Unfortunately, the smallholder production base does not feed the nation and is notoriously susceptible to drought. Also their return to labour under these assumptions is very low and perpetuates rural poverty.

Table 17. Competitiveness with Imports

Product	At K4500/$ ($/T)	Current season ($/T)	At K3500/$ Plus VAT ($/T))	At K2500/$ Plus VAT ($/T)
Maize Import cost	$250	$250	$250	$250
Breakeven price Commercial maize	$202	$250	$264	$342
Domestic advantage	**$48**	**$0**	**-$14**	**-$92**
Smallholder at $1.5 per day	$217	$254	$276	$343
Domestic advantage	**$33**	**$6**	**$26**	**-$93**
Wheat Import cost	$430	N/A	$430	$430
Breakeven price*	$284		$320	$386
Domestic advantage	**$146**		**$110**	**$44**
Wheat flour Import cost**	$449	$449	$449	$449
Domestic production	$391		$442	$533
Domestic advantage	**$58**		**$7**	**-$84**

* This price is a breakeven producer price and NOT a price to the miller since output VAT must be added to the producer price when sold to the miller.
** Cheapest source imported via Nacala to Malawi.
Note that the breakeven price provides no reward for management and is therefore an unsustainable price.

Domestic wheat production has a breakeven price at K2,500 per US$ which is only lower than import parity. When the effects of appreciation on the milling industry are added to those on production, the import parity price of flour poses a strong threat. When VAT is charged on local production it is at a strong disadvantage of $84 per tonne at K2500/$.

The impact of appreciation on livestock production falls on both the stockfeed and the production sector. Stockfeed is subject to cheaper imports which will jeopardise the domestic stockfeed producers and those who supply them, while producers of eggs, poultry and milk in particular will be subject to competition in the market. If VAT imposition on producers and inputs is upheld there will be discrimination against smallscale producers in cost of production and discrimination against VAT registered producers in the markets. Reduction in returns to milk will affect over 3000 smallscale producers and will eliminate expansion in the commercial sector.

Reduced prices in poultry products will diminish income to 43,000 smallscale producers and jeopardise viability and expansion plans in the commercial sectors. Imports will imply reduced domestic employment opportunities.

As the Kwacha value increases, domestic production price tends towards or exceeds import parity, which implies that local producers are increasingly threatened by imports and employment opportunities are subject to externalisation to neighbouring countries.

4.5.   Total Impact

In summary, the profitability of the various enterprises under discussion at the selected exchange rates under the assumptions applied in this analysis are set out in table 18.

Table 18. Changes in Profitability as Percentage of Turnover

Crop	K4500/$	K3500/$	K2500/$
Tobacco	4%	*-13%*	-40%
Coffee	4%	*-11%*	-37%
Vegetables	3%	*-7%*	-14%
Cotton Ginning	4%	*-1%*	-3%
Flowers	14%	*7%*	-5%

In all, as a result of the losses shown above, we project a loss of export revenues in the range of about $106 million per year with a consequent reduction of 190,000 jobs or self employment opportunities over the medium run. Table 19 details the impact by commodity.

Although we consider this the most plausible new level of export activity, consequences could be substantially worse, particularly if bank financing becomes unavailable to underwrite necessary adjustment programs and enable farmers and exporters to weather currently negative returns. The departure of a major ginning company would trigger much broader losses among smallholder cotton farmers than the 25% fall projected above. In a worst case scenario, even at a 3,500 exchange rate, if all exporters and farmers whose returns fall negative exit the industry, export earnings will fall by $245 million, or over 85%. Given that good weather during the current season will cushion the adjustment period and provide temporary relief for many farm groups, we do not consider this apocalyptic scenario likely.

The impact of VAT, turnover and withholding tax will be to reduce the profitability of smallholder commercial farming. The VAT provisions, in particular, which allow large farmers to claim VAT paid on inputs while small farmers cannot, will reduce the ability of commercially oriented smallholders to compete with large commercial farms.   Together, the VAT and withholding tax provisions will increase incentives to market through informal trading channels with associated loss of control over phytosanitary and animal disease issues.

Table 19. Projected Impact of Kwacha Strengthening on Zambian Agriculture

Crop	Export earnings	Employment		Profitability	Reduction in export earnings		Reduction in employment	
		wage labour	small farmers		percentage	$ millions	percentage	# workers
Export crops								
cotton	$81	2,300	280,000	- returns to farm labor fall from to K4,300 per day - exporter margins turn negative - significant farmer exit from cotton industry at 3,500 - massive exit at 2,500 exchange rate	25%	$20	25%	70,575
tobacco	$63	92,000	23,000	- returns to farm production turn negative - large-scale exit from tobacco farming - big buyers lose interest in Zambian market	75%	$47	75%	86,250
flowers	$30	4,000	0	- returns fall but remain positive because of small proportion of Kwacha costs - no new investment, production stagnates - at 2,500 returns turn negative, triggering large-scale exit	5%	$2	5%	200
horticulture	$25	10,500	2,500	- returns to farm production turn negative - switch from vegetables to lower value crops (maize, wheat) '- large-scale non-reversable reduction in exports and employment	90%	$23	90%	11,700
coffee	$11	30,000	150	- returns fall - pressure to mechanize, resulting in lower quality output and increased equipment imports - output constant, falling price reduces export earnings - exports become less competitive because of high local cost of production	10%	$1	60%	18,090
sugar	$65	4,000	1,692	- local sales become uncompetitive and are replaced by imports - no further investment - reduced production and exports - returns to labor falls	20%	$13	20%	1,138
honey	$1.0	35	10,000	- exporter profit margins erode - exports stop, reorient to small domestic market - returns to farming fall	20%	$0.2	20%	2,007
paprika	$1	150	3,000	- exporter margins fall - disinvestment in production and processing	0%	$0.0	0%	0
total export crops	$277	142,985	320,342			$106		189,960

Domestic staples	Value of total production ($ millions)	Employment		Profitability	Increase in imports		Reduction in employment	
		wage labour	small farmers		percent	$ millions	percent	# people
maize	$198	4,000	500,000	- decline in competitiveness in regional markets - increased imports and reduced lean season prices - lower farm prices increase incentives to mechanize - commercial production falls, subsistence production unaffected	20%	$39.6	5%	25,200
wheat	$41	1,500	0	- wheat imports become cheaper - reduced costs of imported machinery but not enough to offset price declines - farm profitability falls - commercial production falls	0%	$0.0	0%	0
sugar	$42	4,000	1,692	- local sales become uncompetitive and are replaced by imports - no further investment - reduced production and local sales	85%	$35.7	85%	4,838
total domestic crops	$281	$9,500	501,692			$75		30,038

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5. AGGREGATE IMPACT ON ZAMBIAN AGRICULTURE

5.1. Poverty and Employment

Seventy percent of Zambia's poor work in agriculture. The bulk of them earn their livelihood on Zambia's 800,000 small farms, where poverty rates reach 84% (Central Statistical Office 1998). The urban poor likewise depend on agriculture, since they spend over half of their income on food. Therefore, agricultural growth will prove central to any effective poverty reduction efforts in Zambia. Only rapid growth in agricultural productivity can simultaneously increase incomes for the majority of Zambia's poor, who work in agriculture, while at the same time reducing costs of staple foods that dominate spending among the urban poor.

For this reason, Zambia's Poverty Reduction Strategy Paper (PRSP) highlights the central role agriculture must play in successful poverty reduction efforts. As the strategy clearly states, "the PRSP primarily … targets agricultural development as the engine of income expansion for the poor." (Republic of Zambia 2002, p. 37). Moreover, growth in agriculture remains critical to growth in manufacturing. Currently, agroprocessing industries account for over 80 % of Zambia's manufacturing output (World Bank 2004). "In view of the potential multiplier effects that the agricultural sector has on the economy, the PRSP sees the restoration of its high and sustained growth as constituting a critical step for reducing poverty in Zambia." (Republic of Zambia 2002, p.52)

Indeed, since the early 1990's, Zambia's rapid move towards agricultural diversification, driven in large part by growth in export agriculture, has already paid dividends. During the 1990's rural poverty declined significantly, from 88% to 74%, while at the same time urban poverty has increased (Table 22). Employment data suggest that Zambia's small farms, which employ the bulk of the country's poor, have particularly benefited from growth in export crops such as cotton, tobacco, honey, paprika and horticulture. Of the roughly 475,000 jobs created over the past decade and a half by Zambia's rapidly growing export agriculture, about 320,000 are on small family farms (Table 20).

The projected loss of roughly 200,000 of these jobs, anticipated under a permanent Kwacha strengthening to 3,500, would constitute a serious setback for Zambia's poverty reduction efforts. The unanticipated strengthening of the Kwacha since the planting period in mid-November of 2005 appears poised to erase about one third of the income gains achieved among rural small farmers over the past decade and a half. During the current transition year, an anticipated bumper harvest will moderate the impact on small rainfall dependent farmers. However, in normal rainfall years, a permanent strengthening of the Kwacha will lead to large-scale smallholder exit from export farming. In that event, the disincentives imposed by this unanticipated currency appreciation threaten to shift Zambia's number one poverty reducing engine into reverse.

5.2. Winners and Losers

Exporters in general lose out under rapid Kwacha strengthening. The roughly 475,000 Zambian labourers who work in export agriculture will be particularly hard hit under a sustained Kwacha strengthening. Their Kwacha income will fall, while domestic prices of basic staples have not. So rural farm groups working in export agriculture will be hardest hit.

Table 20. Trends in Poverty Among Rural and Urban Zambians

	Percent of Population Living in Poverty		
	Rural	Urban	Total
1991	88	49	70
1993	92	45	74
1996	83	46	69
1998	83	56	73
2003	74	52	67
change 1991 to 2003	-14	3	-3

Source: CSO (1998, 2003)

Urban wage earners, however, will come out winners. A strengthening Kwacha will particularly benefit skilled salaried workers who earn in Kwacha and who see prices of imported luxuries – such as televisions, stereo systems and second hand cars – fall by 20 to 30%. The recent boom in imports of used cars suggests that this impact has been swift. Meanwhile, because staple food prices and rents have not fallen, the urban poor have not seen an appreciable gain in their real incomes. The urban elites, about 20% of the Zambian population, have gained perceptibly, largely at the expense of the rural poor.

6. POTENTIAL MITIGATING ACTIONS

6.1. Responses by Farmers and Exporters

Zambian farmers and exporters have responded to the rapid and unexpected currency appreciation in a variety of ways. Detailed in Chapters 3 and 4, their responses boil down to four general options: cost reduction; hedging; develop alternative markets; and exit.

6.1.1. Cost Reduction.

Farmers and exporters have expended considerable efforts to reduce production and marketing costs, not just recently but also over the longer run. Given the competitiveness of international export markets, business viability requires continual innovation, particularly in recent years when rising petroleum prices have lowered profit margins and forced producers to seek a variety of means to contain costs.

Increased productivity offers a potentially powerful tool for reducing unit production costs. This is particularly true among smallholder farmers where cotton yields average only 600 kg/hectare and maize yields average 1.5 tons. From these low levels, considerable gains are possible. For this reason, Zambia's major cotton companies have been investing for nearly a decade, ever since privatization, in farmer extension support aimed at improving the timeliness of planting, weeding, and pest control and trials with improved varieties of seed. They have been major promoters of Conservation Farming and have received regular backstopping from Zambia's Conservation Farming Unit. As a result, Zambia's cotton farmers are its most productive maize producers as well (Jayne and Zulu 2006). Likewise, the best run tobacco farmer associations run their own input supply and extension services also aimed at boosting farmer productivity. Financing the development and extension of these new technologies, however, requires profitable base from which to grow. As exporter margins turn negative, it is difficult to see how the private sector can finance these necessary investments, or whether indeed how long they are willing to incur financial losses in the expectation of long-term gain.

Alternate sourcing of inputs offers another common response. Cotton ginners intend to procure more inputs from abroad in order to reduce Kwacha-based expenses. Horticultural exporters have begun to move away from increasingly expensive air freight to trucking of export vegetables for cheap air shipment out of Johannesburg. Mechanization is a common anticipated response the downwardly inflexible local labour costs. Coffee and sugar production offer prospects for reduction in labour cost through mechanization, albeit at a cost to quality of the product and consequently its export value. Though clearly helpful in moderating labour costs, these pressures will lead to potentially important labour reductions in export agriculture.

Under outgrower systems, most exporters will reduce costs by lowering prices paid to farmers. Though helpful in moderating exporter costs, this price reduction to farmers reduces returns to unpaid family labour. In the case of cotton farmers, returns to labour will fall from roughly K 6,500 per day to K 4,800 (Table 4). Given current double digit inflation, this amounts to a 35% decrease in real incomes, hardly good news for Zambia's poverty reduction efforts.

6.1.2. Hedging

Following the surprisingly quick Kwacha strengthening, hedging has received considerable attention within the banking and business community. Indeed, it is sound financial management to hedge against currency fluctuations by taking a forward position on the currency. But it would be extraordinary, and costly to go to the extreme of hedging to the extent that would be necessary to avoid the impact of a 30% appreciation. Hedging carries the risk that the currency may move counter to expectations, and it also bears a cost in interest and the transfer of risk to a financial institution. It is not a cost-free or risk-free mechanism that lifts the hazards of appreciation from the shoulders of an exporting enterprise.

As exchange rate volatility increases, so too does the risk premium banks must charge for this service. Thus, the recent unanticipated swings in Kwacha valuation have not only destabilized exporter and farmer planning budgets in the short run, they seem likewise poised to permanently raise the private sector's cost of hedging against these fluctuations. As a result, few farmers or exporters have availed themselves of this potential tool.

6.1.3. Alternative markets

Sugar producers currently supply roughly 60% of their production to the local market. But prospects for increasing this share are negligible. Indeed, the strengthening Kwacha has led to large-scale imports of sugar despite the non-tariff barrier (NTB) imposed by the requirement of vitamin fortification for the Zambian market. So sugar producers face simultaneously shrinking domestic and export markets due to loss of competitive edge.

Domestic horticulture markets for the products that are exported are negligible to non-existent, providing no prospect as an alternative outlet for export commodities. Several exporters have moved to divert some of their productive capacity to locally consumed products requiring considerably less labour. But domestic markets are small in relation to 2005 export levels. And so this diversion will not enable most to remain operational.

For other crops, such as cotton, flowers and tobacco, domestic markets are likewise very small. So for major exporters, reorientation to domestic markets is not a serious option. A shift to alternate products for domestic markets is also possible. Yet since cheaper imports will place downward pressure on the prices of many alternative agricultural goods – such as maize, wheat, vegetables, and dairy products – alternative agricultural pursuits will likewise face diminishing profitability. Alternate food staples such as cassava and sweet potatoes will become comparatively more attractive. Though without major new market development efforts, significant supply increases will result in rapidly falling prices.

6.1.4. Exit

As profits turn negative and smallholders face diminishing returns to labour, we expect that many will exit export agriculture altogether. The least productive and most remote will exit first, thus raising overall cost competitiveness of the remaining cohort. Our projects suggest that over the medium run, roughly 190,000 workers and self-employed farmers will exit export agriculture (Table 19).

6.2. Responses by Governments Elsewhere in Managing Dutch Disease

Zambia's current surge of foreign exchange inflows – due to some combination soaring copper prices, foreign aid and debt relief, and banking inflows attracted by high treasury bill rates – resembles classic foreign exchange booms elsewhere. These result in well-recognized consequences for exchange rates and diminished competitiveness of other export products, a consequence typically referred to as Dutch Disease. This section briefly examines the origins, consequences and experience with alternate management responses emanating from elsewhere.

During the 1960's, major discoveries of natural gas in Holland led to an unanticipated windfall in foreign exchange earnings. Rather than accelerating economic growth, as expected, the ensuing natural resource boom instead triggered a rapid currency appreciation that crippled traditional manufacturing exports. Together with growing domestic inflation, this fall in traditional export industries ushered in a decade of lower growth and rising unemployment. Rather than a boon, the rapid inflows of foreign exchange constitute what some refer to as a "natural resource curse". Because these potentially pernicious consequences of rapid foreign exchange inflows first received prominent attention in Holland, this condition is often referred to as Dutch Disease. Any sudden, unmanaged inflow of foreign exchange can trigger an onset of Dutch Disease. Most often, petroleum or mineral discoveries have precipitated the rapid currency appreciation symptomatic of Dutch Disease. Yet large sudden inflows of foreign exchange from any source – including foreign aid, private investment or financial speculation – can also trigger its onset.

Classic cases of Dutch Disease – in which foreign exchange windfalls and subsequent currency appreciation have significantly damaged agricultural and manufacturing exports – have recurred subsequently in many countries, including Mexico, Nigeria and Venezuela. Yet other countries, of which Indonesia is the most conspicuous example, have managed their foreign exchange surpluses in ways that neutralize the potential damage to non-boom sectors such as agriculture. The following discussion illustrates the potential damage Dutch Disease can cause as well as an array of management tools that have been applied in these circumstances. Discussion reviews a range of contrasting cases, focusing on developing countries with large agricultural export sectors.

6.2.1. Nigeria

Nigeria's oil boom of the 1970's offers a classic example of the dangers of Dutch Disease.[4] An eight-fold increase in oil prices over that decade triggered a massive boom in oil export values and foreign exchange earnings. Under intense political pressure, the Nigerian government spent most of its windfall on pay hikes and on public projects of dubious quality. Very little of this investment found its way into agriculture. The resulting budget deficit amounted to 12% of non-mining Gross Domestic Product (GDP), while inflation soared. By 1984, the Naira had appreciated 300% compared to its 1972 level. Rendered uncompetitive by the strong Naira, agricultural exports plummeted by nearly 70%. Even producers of food staples suffered, as imported wheat and maize become cheaper than local production. Food production per capita fell as did average calorie consumption. Overall, agricultural share of non-oil GDP fell by 50%, from 60% in the late 1960's to 30% in the early 1980's. Agriculture's share of national

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[4] See Gillis et al. (1992), Shiff and Valdes (1998) and Shaxson (2005) for details on the Nigerian experience.

employment, meanwhile fell by 20%, suggesting significant reduction on real rural wage rates and welfare. Nationally, dollar-a-day poverty levels increased from 20% to 50% of the national population.

6.2.2. *Indonesia*

Although Indonesia experienced the same surge in petroleum export earnings during the oil price hikes of the 1970's, their government responded very differently and in so doing managed to neutralize the potentially pernicious effects of Dutch Disease on their agricultural sector.[5] Resisting political pressure to spend all of its windfall, the Indonesian government maintained a balanced budget during the boom years. They did boost government spending, but focused it in ways that improved agricultural productivity. They spent on agricultural research, extension, irrigation, rural roads and education. Food security remained a top government priority. Rather than allowing their exchange rate to shoot upwards, they managed it carefully, instituting a series of devaluations – in 1978, 1983 and 1986 – in order to protect the county's traditional, largely agricultural export commodities. As a result, between 1986 and 1972, the Rupiah depreciated by roughly 8% while non-oil exports increased by 7%. By the mid-1980's, Indonesia was self-sufficient in rice production and food production per capita had increased by 30% over pre-boom levels. The contrast with Nigeria could not have been more stark.

6.2.3. *Uganda*[6]

Sudden inflows of foreign aid, like oil revenues, can similarly trigger real exchange rate appreciation, thereby reducing the recipient country's export competitiveness (Younger 1992; Aiyar, Berg, and Hussain 2005). During the early 2000's, foreign aid to Uganda surged, rising from under 10% to 14% of GDP between 2001 and 2003. Simultaneously, world prices slumped for Uganda's number one export crop, coffee. Government authorities became concerned that on top of falling prices aid-induced exchange rate appreciation might further reduce farmer income from coffee exports, with consequently negative impacts on rural poverty. The government, therefore, actively managed foreign exchange inflows in order to ensure a depreciation of the nominal exchange rate during the boom years. Rather than converting this foreign exchange windfall into shillings, a move that would have considerably strengthened the Ugandan shilling, they used the bulk (about three-fourths) of the foreign exchange inflows to build up reserves in the central bank. They likewise maintained a tight monetary and fiscal policy in order to keep inflation low. CPI growth averaged under 10%, even during the foreign aid boom years. This required periodic sales of treasury bills to reduce the money supply, and raise interest rates, a move which also led to a reallocation of domestic savings from private firms to the public sector. As in Zambia, agricultural growth formed a key pillar of Uganda's poverty reduction strategy. Therefore, to combat pressures of aid-induced Dutch Disease, the Ugandan government maintained strict control over inflation and limited sales of their foreign exchange windfall in order to maintain a depreciating nominal exchange rate and maintain agricultural export competitiveness.

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[5] See Gillis et al. (1992), Timmer (1994), Roemer (1994).
[6] See Aiyar, Berg and Hussain (2005) as well as IMF (2005).

6.2.4. Generalizations

The voluminous literature on Dutch Disease suggests three general prescriptions for managing sudden inflows of foreign exchange.[7] Firstly, fiscal discipline is necessary to avoid large budget deficits and maintain inflation at low levels. Secondly, active management of the real exchange rate is necessary to avoid exchange rate volatility, which can prove highly damaging to export oriented agriculture and industries, and to ensure a depreciation rather than an appreciation of the currency. Together, exchange rate and budget discipline can effectively sterilize the revenues from the export boom, saving them to finance a flow of productive investments. Third, government management has involved investing resources from their export boom effectively, on productive investments in public goods such as agricultural research, extension, roads and education or in lending to private sector for productive purposes.

The Zambian government has not adopted any of these three common tools of macro-economic management in responding to the recent boom in foreign exchange inflows. The Government of Zambia (GRZ) has run large budget deficits, averaging 8% of GDP over the past decade and a half and contributing to 25% annual inflation over that period.[8] Instead of managing the exchange rate, Zambia has allowed the Kwacha to float freely, resulting in a 30% appreciation over the past six months, the bulk of it occurring abruptly after the agricultural planting season, during the last two weeks of November 2005. Likewise, they have largely failed to deploy public resources for investment in agriculture. In 2006, the GRZ budget proposal allocates only 6% of total spending to agriculture. Of this, the largest line items, amounting to roughly 40% of agricultural sector spending, are devoted to recurrent subsidies on fertilizer and the FRA, while 6% goes to operating expenses for research and extension and only 3% on irrigation development.

6.3.   Policy Implications

The recent Kwacha appreciation has led to an abrupt fall in incentives for Zambia's agricultural export sector. Prospects for disinvestment are real as is the likelihood of laying off of labour. From a technical standpoint, available evidence suggests that the Kwacha strengthening to 3,500 will reduce export agriculture earnings by about $106 million, and a further gain to 2,500 will largely destroy export agriculture. Combined with the original 2006 budget proposal for 45% withholding on agricultural sales, even a 3,500 exchange rate will drive many smallholders out of export agriculture altogether. The result is likely to be a significant setback in recent poverty reduction efforts.

Clearly, the recent Kwacha gain affects all sectors of the economy, not only agriculture. So any policy response will require careful consideration of the potential implications for the service and manufacturing sectors as well. For this reason, the Bank of Zambia has engaged in a parallel study to examine the impacts in other sectors as well as the general equilibrium implication of alternate policy responses. This broader analysis will result in a more comprehensive assessment of winners and losers. Proposals for addressing the concerns of various affected constituencies must then be addressed in a political arena.

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[7] See, for example, Lewis (1989), Gillis et al. (1992) and Shiff and Valdes (2005).
[8] Rates in early 2006 have come down to slightly over 10%. Gupta et al. (2006).

In the absence of any policy adjustments, under the current exchange rate level and policy environment, this study projects that Zambia risks losing roughly one-third of its agricultural export base over the medium run, thereby seriously undermining current economic diversification and poverty reduction efforts.

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Terms of Reference

Consultancy to propose measures to mitigate the impact of Kwacha appreciation on the agricultural export sector.

Background

The agricultural sector in Zambia has responded to incentives applied by Government to increase exports of cotton, tobacco, vegetables, flowers, coffee, paprika, honey and animal products. The Non-Traditional Exports (NTEs) expanded from $263 million in 2000 to approximately $500 million in 2005, of which agricultural products comprised the major share.

The growth in agricultural exports amounted to 12% each year and had significant impact not only on foreign exchange earnings but on rural incomes. This is explained by the fact that Zambia's comparative advantage in the export market depends upon availability of labour so that, with the exchange rate prevailing prior to October, 2005, labour intensive crops held a viable competitive position internationally.

The labour has been engaged either through direct employment by commercial farming enterprises or through outgrower schemes in which smallscale producers sell their produce under contract to organisations that provide inputs, and then process and market the final output. Cotton production by smallholders, for example, provides income to about 300, 000 families amounting to 1.8 million individuals or 16% of the population. Vegetables and floricultural exports employ over 16,000 workers and engage 2,500 outgrowers; tobacco employs 200,000, coffee, paprika and honey are similarly major sources income to many thousands of poor families in rural or peri-urban areas. Indeed honey exports provide the major source of income to rural communities in North Western Province.

The fundamental macro-economic forces that governed the Kwacha exchange rate, which provided export opportunities, were subjected to critical changes as a result of a boom in mining, debt relief, aid inflows and delays in importation of both fuel and maize. While aid inflows and distortions to importation patterns may be either seasonal or spasmodic, and therefore only temporary in their impact on the exchange rate, the returns from mining are likely to be sustained for some years. Relief from debt is long-term and represents a shift in the fundamentals that govern the exchange rate. The Government and Bank of Zambia has chosen not to engage in any measures that would mitigate the impact of these fundamental factors governing the exchange rate, so it is likely that the resulting appreciation of the Kwacha will be sustained for some time.

The result of the Kwacha appreciation is directly proportional to the reduction in Kwacha returns from exports. i.e. 30% appreciation of the Kwacha results in a 30% reduction in Kwacha returns from exports. Since profit margins from well-managed export operations are limited by competition to single figure percentages, the loss of 30% of Kwacha returns can imply conversion of meagre profits into heavy loss. The extent of the loss depends on the proportion of foreign exchange earnings that are converted to Kwacha. Labour is paid in Kwacha, so the more labour intensive an operation, the greater the proportional loss.

Reductions in Kwacha earnings from exports result in a need for drastic reduction in labour costs. Since reductions in wages would be unacceptable, this means either conversion to

mechanised operations or withdrawal from the enterprise by laying off hired labour. In the case of outgrower schemes it implies reduction in producer price beyond the viable range. Therefore, the impact of Kwacha appreciation on rural and peri-urban families is both extensive and profound.

The positive aspect of Kwacha appreciation will take time to be effective since there is far greater reluctance to reduce prices than to raise them. Even if agricultural input prices were to be reduced in direct proportion to exchange rate appreciation, this would not return export enterprises to profitability since the proportion of inputs to outputs is low.

Reduction in inflation and its consequent reduction in interest rates on Bank loans will be similarly slow. Furthermore the opportunity for banks to derive substantial returns from their capital resources through treasury bills has not been withdrawn, so there is little effective downward pressure on interest rates.

While it is clear that Kwacha appreciation is devastating for the export sector, there are gains to be derived from domestic production since there should be reductions in some input costs, although costs of labour are not included among them. However, one implication of the stronger Kwacha is that all imports are cheaper, including agricultural produce, so that the Kwacha import parity prices are also reduced. Zambia still remains a comparatively costly production base and we may now find that we are uncompetitive against our neighbours who could export basic commodities to us more cheaply than we could produce them domestically. This could happen in the context of impending reduced tariff barriers, resulting in the Zambian economy becoming again entirely dependent on the mining sector, and income-earning opportunities for the rural poor collapsing again.

In the context of the assumption that the Kwacha has appreciated for the medium term, ZNFU wishes to engage the services of a consultant to quantify the impact and to determine a strategy to be proposed to government to mitigate the impact on rural communities who are dependent on income from agricultural exports, and to determine the likely outcome on domestic production of staple crops.

Scope of Work

The consultant is required to determine the current extent of agricultural exports and the impact on their economic viability of exchange rates within the range of K3000 to K4500 per US$. He/she is also required to quantify the likely impact in the agricultural export sector under the same scenarios of diminished viability on:

- employment of farm worker earnings and income earning opportunities for outgrowers,
- on tendency to mechanisation and consequent foreign exchange demands for capital equipment,
- on tax revenue, and
- on prospects for Foreign Direct Investment (FDI).

The study shall refer to all NTEs but will concentrate on the agricultural sector in a crop-by-crop analysis with an emphasis on export crops. It will explore and quantify the benefits and threats of appreciation on production for domestic consumption, including import parity pricing. To this end, the consultant will confer with a range of stakeholders, including farmers, investors, traders, international markets, and banks.

The study will make reference to other countries that have faced similar situations and thereby explore the scope for mitigating action that can be taken within the context of the appreciated Kwacha by Government and by producers. It will make proposals, based on demonstrations of the impact on the industry, on employment, on tax revenue and on foreign exchange earnings for consideration by stakeholders.

Duration and Timing of the Study

The study is urgent for two reasons: firstly, export enterprises are operating at a loss and need to resolve the issue before they are forced to cease operating, and, secondly, the issues may be resolved within the imminent budget announcements. The duration of the study is therefore limited to 15 days and the draft report is to be delivered to the R&D department of ZNFU by 30th January, 2006.

Deliverables

A draft report in 10 hard copies and soft copy.
Final report to be delivered in 10 hard copies and soft copy within 7 days of receiving official notification from ZNFU of the required modifications.

Table 21. Characteristics of Zambian Agricultural Producers

CHARACTERISATION	SMALL-SCALE	EMERGENT	MEDIUM SCALE	LARGE SCALE
Number (1999)	459,000	119,200	25,230	740
Total Ha	0.5 – 9.0	10-20	20-60	>60
Crops grown	Food crops	Food/Cash crops	Food/Cash crops	Cash crops
Production Focus	Subsistence	Commercial/ subsistence	Commercial/ subsistence	Commercial

Source: CSO 2001a and 2001b

Table 22. Trends in Production and Import of Staple Foods in Zambia

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Maize															
production	1,092,671	1,095,908	483,492	1,597,767	1,020,749	737,835	1,409,485	960,188	638,134	822,056	881,555	601,606	602,000	1,161,000	1,113,916
imports	100,000	42,000	680,000	316,000	13,461	102,221	40,000	52,397	415,000	14,410	5,481	10,334	269,101	160,954	6,223
Soya															
production	26,791	27,713	7,006	26,001	24,630	21,129	40,050	29,292	12,376	26,704	28,311	2,350	16,000	15,000	15,000
imports	0	0	12	150	2,066	1,869	520	1,307	1,006	1	5,161	5,397	100	1,638	72
Wheat															
production	55,011	65,236	54,490	69,286	60,944	38,019	57,595	70,810	63,925	69,226	75,000	80,000	75,000	135,000	135,000
imports	37,000	5,119	26,000	21,200	19,000	18,085	65,000	18,414	61,000	49,167	54,662	50,258	70,525	35,157	22,003
Rice															
production	6,081	9,637	5,467	9,235	4,196	7,993	8,775	8,232	4,223	9,702	9,198	7,686	7,920	7,920	7,920
imports	4,825	992	5,856	1,897	5,827	3,710	13,153	6,853	6,300	7,450	6,557	13,629	20,710	17,407	14,192
Sorghum															
production	19,591	20,939	13,007	35,448	35,070	26,523	35,640	30,729	25,399	25,493	30,245	16,800	16,000	20,000	19,000
imports	0	0	1	66	0	20,000	200	45	5,400	1,773	34	54	3,172	27	4,040
Cassava															
production	640,000	682,000	682,000	744,000	744,000	744,000	744,000	702,000	816,963	970,823	815,248	835,686	856,124	876,562	897,000
imports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sweet potato															
production	54,000	56,000	50,000	55,000	53,000	51,000	54,000	51,000	50,000	52,000	52,000	53,000	53,000	53,000	53,000
imports	0	0	0	0	0	0	0	2	10	56	1	4	6	13	4

Source: FAOSTAT.

Table 23. Performance of Non-Traditional Exports: 1997 - 2003 (US $ Million)

	1987	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Agriculture (USD)														
cotton				5.2	7.8	44.0	17.1	9.2	9.5	15.6	30.2	32.3	54.8	81.0
tobacco	-	-	-	4.8	9.1	15.0	8.0	8.5	12.0	9.5	27.0	36.1	55.1	57.9
other commodities	-	-	-	14.0	27.6	31.9	37.1	57.8	15.6	26.3	19.3	29.5	53.8	27.8
primary agricultural commodities	5.2	-	10.0	24.0	44.5	90.9	62.2	75.5	37.1	51.4	76.5	97.9	163.7	166.7
sugar	-	17.5	21.1	25.0	33.8	30.8	33.6	23.1	22.8	37.0	35.1	35.2	36.0	65.3
other processed	-	-	0.0	0.0	0.0	0.1	15.8	9.9	12.8	6.0	8.6	8.7	8.7	8.7
sugar and other processed agriculture	-	-	21.1	25.0	33.8	30.9	49.4	33.0	35.6	43.0	43.7	43.9	44.7	74.0
horticulture	1.7	2.4	2.4	2.6	3.3	15.9	20.6	23.9	27.4	36.4	44.9	46.0	35.9	18.9
flowers	0.3	-	9.1	18.0	4.7	21.3	32.9	42.7	33.9	34.1	30.3	22.4	25.0	30.0
livestock and livestock products	2.5	-	0.4	0.7	1.9	3.4	4.1	4.4	3.4	3.1	5.2	3.6	3.6	3.6
other agriculture	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
total agricultural exports	9.9	-	43.0	70.3	88.2	162.4	169.2	179.5	137.4	168.0	200.6	213.8	272.9	293.2

Source: Export Board of Zambia.

Table 24. Comparative Costs of Landed Flour

Origin	Zambia Domestic Prod COMESA		Zambia Imported COMESA		Malawi Nacala COMESA		Malawi Beira COMESA		Swaziland COMESA		Mauritius Beira COMESA		Madagascar Beira COMESA		Mozambique Beira Non-COMESA		Mozambique Nacala Non-COMESA		Namibia Walvis Non-COMESA		Tanzania Dar es Salaam Non-COMESA		Lesotho Dar es Salaam Non-COMESA	
Cost of wheat		310		170		192		185		210		185		195		185		192		185		190		210
Freight & discharge of wheat				175		70		105		0		25		25		25		25		25		25		0
Insurance & clearing				8	2.5%	7	2.5%	7		0		0		0		0		0		0		0		0
Import duty	0%	0	15%	53	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0
Into mill cost		310		406		269		297		210		210		220		210		217		210		215		210
Extraction	78%	397	78%	520	78%	344	78%	381	78%	269	78%	269	78%	282	78%	269	78%	278	78%	269	78%	276	78%	269
Cost of conversion		45		45		45		45		45		45		45		45		45		45		45		45
Transport flour to Lusaka						60		60		150		90		90		90		135		125		65		150
Insurance & clearing											2.5%	7	2.5%	7	2.5%	7	2.5%	7	2.5%	7	2.5%	7	2.5%	7
Freight												55		55		0		0		0		10		10
Duty															25%	79	25%	81	25%	79	25%	80	25%	79
Flour CIF Lusaka		**442**		**565**		**449**		**486**		**464**		**466**		**479**		**490**		**546**		**525**		**483**		**560**

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