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Appendix Two

ZAMBIA: 1990s ECONOMIC REFORM PROGRAMMES

Liliosa Maveneka[1]

A majority of Zambians wanted an end to the economic stagnation and economic mismanagement associated with one party and the new government, which came into power in 1991, had to restructure the economy. According to McPherson (1995), the government understood that the resumption of international support depended on actions designed to restructure the economy. The multiparty democracy also held prospects of greater accountability and improved governance. In the first few months of governing, the changes made included:

- Elimination of maize meal subsidies
- Abolition of export licences
- A faster rate of crawl in the official exchange rate
- The removal of barriers to entry in the financial and insurance markets
- The lifting of interest rate ceilings.

In the 1992 budget the government sought to reduce the budget deficit and announced steps to:

- Privatisation and reform of parastatals
- Reform tax system
- devalue the kwacha by 30%
- made commitments to reduce inflation, stabilise the economy and revive growth.

But this was not realised as 100% salary increase was granted to civil servants and $30 million subsidy was given to Zambia Airways. Drought relief added to budget problems. The budget deficit was financed by money creation and inflation rose from 111% at the end of 1991 to 191% in 1992. The end of September benchmarks agreed with the IMF were not met. Business and people lost confidence in the government's ability of economic management. Several initiatives were introduced at the end of 1992/ beginning of 1993 including unifying the exchange rate, freeze of civil service salaries, import and export licences removal. The Bank of Zambia lending to ZIMOIL(the State owned oil company) was stopped in April 1993 and the growth rate of reserve money dropped sharply. Inflation declined. As a result nominal interest rates began to fall towards the end of 1993 and the exchange rate stabilised as well. (McPherson, 1995).

The structural adjustment programmes undertaken by Zambia in the 1990s included the 1991 Economic Reform Credit, Rights Accumulation Programme 1992-95, the 1994 Economic and Structural Adjustment Credit, the 1995 Enhanced Structural Adjustment Facility, the 1999 Structural Adjustment Fund, the 1999 ESAF and the 2000 HIPC Decision point (Table 5 and Appendix).

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[1] This paper provides an overview based primarily on World Bank and other documentation available on internet. Liliosa is a programme officer with ZFDT (Zimbabwe Farmers Development Trust) and can be contacted on zfdt@africaonline.co.zw

According to World Bank (2003) in addition to liberalization of exchange and interest rates in the 1990s the government introduced trade reforms in the period 1995- 1998 which simplified the tariff structure, removed quantitative restrictions and transformed Zambia's trade regime into one of the most open in the sub-region. The government also successfully concluded debt reduction. The Zambia GDP growth rate fell from an average of 1.5% in the 1970s to 1.4% in the 1980s and 0.3% in the1990s. Over the period 1995-2000 the GDP grew by an average of only 2.1% compared with the population growth of 3.1% pa. As the population growth rate was above the GDP growth rate and coupled with inflation this resulted in a decline in real per capita income of 16 % p a since independence. In 2002 Zambia's per capita was only about 60% of that in 1960s, in real terms. Graph 1 shows the decline in real GDP per capita from 1960 to 2000. Inflation increased steadily from about 10% in the 1970s to an average of about 70%, in the 1990s. Inflation averaged about 25% in the period 1995-2000 and then began falling as in Table 4. Further almost all indicators of social and poverty condition deteriorated during the 1990s. In formal manufacturing employment numbers went down from from 75400 in 1991 to 43000 in 1998. In agriculture the number of paid employees fell from 78000 in 1990 to 50000 in 2000.

Economic Liberalization and the Agriculture Sector

World Bank (2001) reports that the economic liberalization in the 1990s resulted in less share of public expenditure directly allocated to agriculture, as the government attempted to promote private sector development. The share of the agricultural sector in the aggregate public expenditure has been "erratic" since 1994:

- 2.5% in 1996
- 6.0% in 1997
- 3.1% in 1998
- 3.5% in 1999.

To make the situation worse, the appropriated budget for the sector was often not released (for e.g in 1997, the disbursement to the sector was 55% of the allotted budget,World Bank, 2001). The mixed results in agriculture performance indicate that the sector has been largely and indirectly affected by economic policies (mainly macroeconomic and trade policies). The inflation in Zambia tended to maintain a relatively higher real exchange rate, which favoured non-tradable over tradable goods. Agriculture is more tradable than non-agriculture. Although trade taxes and quantitative restrictions on imports and exports have been liberalised, there were other factors, which continue to hamper agricultural exports. These include high transaction and transportation costs. The squeeze on infrastructure spending in the 90s, particularly in the rural areas deterred growth in agriculture. Improvement of rural infrastructure improves the efficiency in sales of agricultural production.

The World Bank (2003) view on the subsidies to fertilizer and maize sales by the Food reserve Agency is that this has hampered the development of private trade as well as distorting farm production. The Bank referred to a study by Mundlak (2000), which showed that a majority of fertilizer users were commercial farmers who consumed about 70% of fertilizers in the country and that very little of the maize sales came from poor

farmers. The World Bank (2001) highlighted the following achievements in the agriculture sector:

- Between 1994 to1998 the contribution of agriculture to GDP was around 15-19% and increased to about 21% in 1999 and 2000
- Agricultural export increased from less than 2% of total export in 1990 to 10%and 20% in 1996 and 1999, respectively.

Further, most of the output from manufacturing came from agro-based operations.

Comments on Successes and Failures

The World Bank(2003) rated the macroeconomic performance of Zambia as satisfactory although noting that the economy continued to exhibit weak uneven growth, high inflation, low savings rates, high real interest rates and a vulnerability to shocks because of too much dependence to copper. The Bank reported that following the sale of the Zambia Consolidated Copper Mines (ZCCM) the stronger performance by the mining, manufacturing and service sectors led to GDP growth rate of 3.5% in 2000, 4.9% in 2001 and about 3% in 2002. Inflation which was about 30% at the end of 2000 went down to 18.7% at the end of 2001 due to ' prudent financial' polices, decelerated food prices and appreciation of the kwacha. The rise of inflation to 26.7% in 2002 is attributed to a rise in food inflation!

But, Situmbeko et al (2004) questions why World Bank praised Zambia for success in its privatisation programme when many jobs were lost and some of the enterprises collapsed after privatisation. While reducing import tariffs can be beneficial to consumers of imported products it can kill local industries as happened in Zambia. The removal of import tariffs made it difficult for recently privatised industries to compete with imported goods. They make the case that trade liberalization has been disastrous for Zambia's manufacturing sector. As a result of the lowering of tariffs on textile products, there were large increases in imports of cheap second- hand clothing from industrialised countries. The Zambia textile industry collapsed as it could not compete with these imports: there were more than 140 textile manufacturing firms in 1991 and in 2002 the number was reduced to eight. Some private owners of the new companies found it was good business sense to shift their plants to neighbouring countries and import into Zambia what they used to produce there. They point to employment figures, which came down in the 1990s as shown in Table 5. Income from tariffs was an important source of government finance before liberalisation. Taffiffs as a percentage of tax revenue fell from 37% in 1990 to 26% in 1998, McCullock et al (2000).

Situmbeko et al (2004) argue that the policies being foisted by WB and IMF over the past twenty years have been a dismal failure. They give the example of the agricultural sector where it was the government intention that under the agricultural liberalisation reforms, services previously supplied by the state (mainly, credit, agricultural inputs and agricultural marketing) would be provided by the private sector. Efforts started in 1991 under the World Bank Economic Reform Credit and then expanded into the Agricultural

Sector Investment Programme (ASIP). This did not benefit the rural poor. A World Bank study acknowledged that the removal of subsidies on maize and fertiliser led to stagnation of the agricultural sector (Deininger et al).

The 2003 Human Development Report reported that 54 countries were poorer than they were in 1990- of the twenty which fell in Africa, Zambia was the fourth worst performing economy in Africa with a negative growth rate of 1.7% per capita p.a.. It was the worst performer, which was not in conflict. World Bank attributed the decline in the social sector spending to a relatively high inflation-as the tax revenue expressed as a percentage of GDP remained stable at 18-20 % since the early 1990s.. The World Bank also attributes the decline in operational expenditure to the Zambian wage bill, which remained large relative to overall government recurrent expenditure and so crowding out operational expenditures.

Challenges faced by Zambia

Among reasons given by World Bank for Zambia' poor record from the 1990s, are:

- poor performance of copper sector and adverse terms of trade shocks
- macroeconomic instability in particular high inflation and high interest rates
- lack of timely structural reforms

World Bank (2001) considers the main challenge facing the Zambia agriculture as the low productivity. Whereas in the 1980s increased productivity was coming from area expansion this has been slowed by the labour supply- in spite of the urban to rural migration in Zambia. The labour supply has been made worse by HIV/AIDS. Technologies that increase yield have reached a few in Zambia

According to the World Bank (2003), challenges faced by Zambia since 2000 include:

- the September 11 bombing and the ensuing slowdown in the world economy which affected copper export and also tourism.
- The pulling out of Anglo American Corporation from operating the Kankola Copper Mines which produce about two thirds of Zambia's copper
- Food crises which were caused by drought and began in May 2002.

Zambia's political arena has not been completely stable since the transition to multi-party rule in 1990. It was a one-party state for almost thirty years.

- A state of emergency was declared in 1994
- Political tension increased after the Constitution was amended to block Kaunda from contesting the 1996 election
- A failed coup in 1997 was followed by repressive measures against opposition parties.
- In the run up to the 2001 elections President Chiluba's attempt to run for a third term in widespread factional struggles within and across the major parties. (World Bank, 2003)

Table 1 Zambia: Structure of Output and Real GDP Growth, 1970s- 2002

	1970s Avg.	1980s Avg.	1990s Avg. 95	YR96	YR97	YR98	YR99	YROO	YROl	YR02
PercentShare inGDP										
Agriculture	14.6	15.8	21.1	17.6	18.7	21.1	24.1	27.3	22.1	22.0
Manufacturing	16.2	25.0	21.2	13.4	13.2	13.0	12.2	12.7	11.1	11.6
Mining	24.4	15.5	10.7	13.7	11.3	7.1	4.2	3.2	4.4	3.9
Construction	7.3	3.0	4.5	4.0	5.0	5.0	5.2	5.0	6.2	7.4
Energy	2.4	1.7	2.8	3.7	4.7	4.1	3.7	3.2	3.8	3.4
Services	35.1	38.9	39.6	47.7	47.1	49.7	50.6	48.6	52.3	51.7
Growth Rates, 1994 prices										
GDP	1.6	1.4	0.3	6.6	3.3	-1.9	2.0	3.5	4.9	3.0
Agriculture	2.2	3.5	4.8	-0.6	-5.1	1.2	6.9	1.8	-2.4	-4.1
Manufacturing	4.5	3.6	1.8	5.5	5.1	1.8	2.8	13.5	4.2	5.8
Mining +quarrying	-2.2	-0.8	-10.2	2.8	2.2	-25.1	-24.8	-5.1	14.0	16.4
Construction	-1.9	-2.7	-3.2	-11.0	29.0	-9.1	10.2	1.2	11.5	17.4
Energy	2.5	-2.0	2.8 1.5	-5.6	4.2	0.6	2.6	1.1	12.6	-3.2
Services	-0.2	1.1	1.8	15.0	4.0	4.3	6.6	6.0	4.9	3.2

Source: World Bank, Zambia Live Database in World Bank 2003

Table 2: Macroeconomic indicators[i]

	1960	1970	1980	1990	1995	2000
Real GDP per capita (US$)	1,207	1,335	1,239	1,021	814	892
Real domestic income (Adjusted for terms of trade changes) (US$)	2,325	3,089	1,546	1,154	844	786
Government share of real domestic income (Adjusted for terms of trade changes) (per cent)	25.9	47.7	50.7	41.8	19.2	10.2
Exports as per cent of GDP	-	-	-	36	31	27
Imports as per cent of GDP	-	-	-	37	40	37

FDI inflows (US$ millions)	-	-	-	203	97	122

Table 3: Paid employment 1990-2000[ii]

Year	Public	Mining and manufacturing	Agriculture	Other	Total
1990	159	142	80	162	543
1991	162	140	78	164	544
1992	171	136	82	158	546
1993	168	126	83	143	520
1994	174	108	79	136	497
1995	173	108	69	135	484
1996	176	95	68	140	479
1997	170	92	59	155	475
1998	174	86	59	157	467
1999	184	85	60	148	477
2000	185	83	50	158	476

Table 4: Zambia Macroeconomic Indicators, 1970- 2000 (In Percent)

	1970s	1980s	1990s	1995	1996	1997	1998	1999	2000	2001	2002
	average	average	Average								
CPI inflation (%)	10.2	36.1	70.9	35.2	45.2	24.5	24.4	26.8	30.1	21.7	22.2
Int rate (%)(lending)	7.8	16.0	54.7	45.5	53.8	46.7	31.8	40.5	38.8	46.2	45.2
Exchange rate (kwacha/USD)	0.7	4.8	903.1	866.0	1207	1315	1862	2388	3110	3608	4398

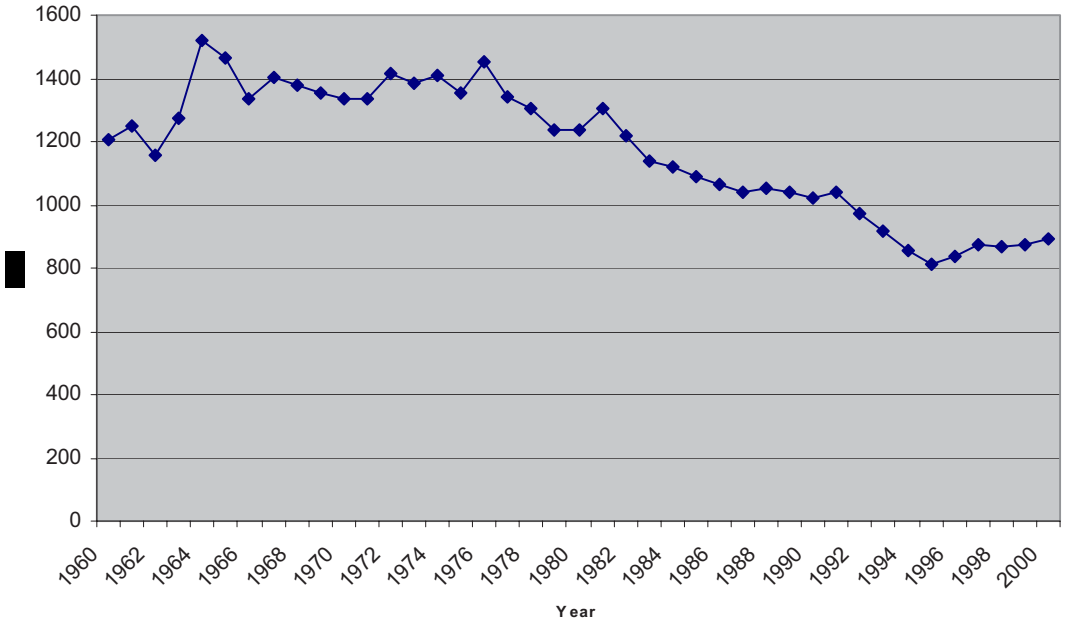
Note: the 1990s average inflation rate was high because of the very high inflation in the first half of the 1990s.
Source: World Bank, 2003.

Table 5: Post-1991 Conditions in IMF and World Bank programmes[iii]

Institution	Loan	Requirements
World Bank	1991: Economic Reform Credit	Phase out maize subsidies, begin liberalising maize markets, limit bank credits, remove tariff bans, lay-off 'surplus' civil service staff, announce privatisation policy and offer at least six parastatal companies for sale, complete studies of Zambia Airways.
World Bank	1992: Privatisation and Industrial Reform Credit (PIRC I)	Improve fiscal and monetary performance, harmonize sales taxes, broaden tax base, reduce tariffs, retrench 10,000 civil service workers, enact privatisation law, offer an additional 10 parastatals for sale, restructure Zambia Industrial and Mining Corporation (ZIMCO).
IMF	1992-95: Rights Accumulation Programme (RAP)	Restore macroeconomic stability, eliminate arrears to international creditors, implement Economic Recovery Program in collaboration with multinational finance institutions.
World Bank	1993: PIRC II	Improve fiscal and monetary performance, reduce tariffs, develop plans for land markets, reform Investment Act, offer for sale 60 companies, establish Privatization Trust Fund, study options to privatise Zambia Consolidated Copper Mines (ZCCM).
World Bank	1994: Economic and Structural Adjustment Credit (ESAC I)	Redirect budget to social sectors (health and education), eliminate export ban on maize, create legal basis for land leasehold and begin sale of state-owned farms, adopt acceptable financial plan for Zambia Airways.
World Bank	1995: Economic Recovery and Investment Project (ERIP)	Introduce value added tax, improve budget management procedures, meet minimum budget and spending targets for key social services, reform social security, adopt and implement plans to privatise ZCCM.
IMF	1995: Enhanced Structural Adjustment Facility (ESAF)	Quantitative benchmarks: increase net domestic assets of the Bank Of Zambia (BOZ), increase international reserves, reduce government domestic arrears. Structural performance criteria: reform civil service, publish banking regulations, privatise ZCCM.
World Bank	1996: (ESAC II)	Maintain a social sector budget of at least 35 per cent, privatise ZCCM, implement 1995 Land Act, implement National Housing Policy of 1995, amend Employment and Industrial and Labour Relations Act, formulate policy on collaboration with NGOs in welfare service delivery.
World Bank	1999: Structural	Structural performance criteria: reform civil service,

	Adjustment Fund	publish banking regulations, privatise ZCCM.
IMF	1999: ESAF	Privatisation of state enterprises; including ZCCM, Zambia Telecommunications (ZAMTEL), ZNCB, Zambia Electricity Supply Organisation (ZESCO) and Zambia Post (ZAMPOST). Refrain from intervening with the exchange rate, liberalise the strategic grain reserve and discontinue distribution of fertiliser. Tight fiscal and monetary policy.[iv]
IMF and World Bank	2000: HIPC Decision Point	Finish privatisation of key remaining state owned enterprises, especially ZESCO, ZAMTEL, Zambia National Oil Company (ZNOC) and ZNCB.[v]
IMF	2001: PRGF	Privatisation of ZNCB and ZESCO; liberalise and privatise energy sector and ZNOC. Refrain from intervening with the exchange rate, limit government expenditure.[vi]

Graph 1: Real GDP per capita 1960-**2000**[vii]



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WHERE SHOULD LAND TENURE POLICY BE IN SOUTHERN AFRICA?[1]

by
Mandivamba Rukuni[2]

1. INTRODUCTION

Land tenure rights are assuming greater significance in every African country, and this issue will almost certainly be a most burning one this Century. Southern African governments have to appreciate that transforming agrarian systems into urban-industrial economies invariably requires fundamental changes in many institutions, including those of land tenure. The distribution of landownership is a major factor that influences this transition from one form of social and political order to another. Moore (1966) quoted in Dorner (1992) sums up the experience of all industrializing countries in this separation of a substantial segment of the ruling classes from direct ties to the land. The Southern African legacy, however, can also be summed up in the lack of political wisdom or vision in terms of public policies, particularly for agriculture and natural resource management. Erratic rural economic growth is today translated into pervasive poverty, hunger, unemployment and environmental decline. It is now widely accepted that rural economic development is ultimately dependent on building strong and effective rural institutions and empowered communities. If Southern Africa is to achieve meaningful levels of economic development and social progress, then issues of agriculture and natural resource management can no longer be divorced from issues of politics, democracy and good governance.

This paper is premised on growing evidence that agricultural growth and efficient management of natural resources are dependent on the political, legal, and administrative capabilities of rural communities to determine their own future and to protect their natural resources and other economic interests. The lack of this power (or lack of democracy) is translated into insecure tenure rights, abuse of common property and resources, dis-enfanchisement of rural people, particularly women, and the breakdown or weakening of rural economic institutions. Land reforms and land tenure reforms are infamous in Latin America for their limited success, while such needed reforms are conspicuous by their absence in Africa. Where land distribution is highly inequitable, arguments against land reform are basically ideological and private property is assigned near-sacred rights. Private property is then elevated to the status of foundation of civilized society. But, as Dorner (1982) argues, if this premise holds, then it must likewise be accepted that private property cannot perform this noble function if most people are without it!

2. LAND TENURE, LAND REFORM AND SECURITY OF TENURE

Both colonial and African governments alike have shown little respect or understanding of the land tenure systems practiced by the majority of their rural people. Governments need to appreciate that land tenure institutions are invariably unique and develop over time to suit the local needs.

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2 Programme Director, W.K. Kellogg Foundation. Views expressed in this paper, however, do not necessarily represent those of the Kellogg Foundation

3 Peter Dorner in this classic entitled “Latin American Land reforms in Theory and Practice, A retrospective Analysis” refers to the Asian experience in relation to Latin America. He cites the land reforms in Taiwan and South Korea as having occurred early in their growth and industrialization process, and that the industrial sector was never as closely tied to the inegalitarian rural structures; as is often the case in Latin America.

Moreover, land tenure institutions are rooted in value systems and grounded in religious, social, political and cultural antecedents which make them vulnerable to outside intervention. Within Southern Africa, the nexus between tenure and government is found in the colonial and post-colonial belief that indigenous or traditional tenure systems are incompatible with Western or 'modern' systems of government, as well as the associated economic institutions. In order to examine this question and its implications, I will first discuss the concept of tenure security and then describe the various generic tenure systems, their possible evolution, and relevance to development.

For clarity, let us differentiate land reform from land tenure reform. Land reform encompasses any change with redistributes land. Because land is a finite resource and its ownership generally symbolic of wealth, social status and political power, all forms of land reform are political in nature. Land reform, therefore, often involves restructuring patterns of wealth, income flows, social status, prestige and so on, and these are the very basic elements or ingredients of politics. Land reform, is a revolutionary process and passes power, property and status from one societal group to another. Land tenure reform, on the other hand, involves changes in the rules that govern land and related property rights. This explains then the close association between land reform and land tenure reform and why the two often go together.

The scholarly literature on tenure places emphasis on the need for tenure security, and that the various types of tenure (including the "registered title") can be secure or insecure depending on social, legal and administrative institutions in a given society. Security of tenure is associated with four sets of rights. The basket of rights, therefore, indicates the relative security of a tenure system depending on secured rights from the four sets as follows:

- **use rights**: are rights to grow crops, trees, make permanent improvement, harvest trees and fruits, and so on;
- **transfer rights**: are rights to transfer land or use rights, i.e., rights to sell, give, mortgage, lease, rent or bequeath;
- **exclusion rights**: are rights by an individual, group or community to excluded others from the rights discussed above; and
- **enforcement rights**: refer to the legal, institutional and administrative provisions to guarantee rights.

The four major categories of property rights define uses that are legitimately viewed as exclusive and also define who has these exclusive rights (Feder and Feeny, 1991). Rights may also have a temporal dimension. In parts of Africa and South Asia, for instance (as was the case in medieval England) rights to the crop are private whereas rights to the stubble after harvesting are communal. In parts of Africa, land and tree tenure is separate. In addition, rights may specify conditions effecting types of rights transfer and parties to who such transfers may be effected.

Institutional arrangements include instruments for defining and enforcing property rights, be they formal procedures, or social customs, beliefs, attitudes and so on, determining legitimacy and recognition of these rights (Taylor 1988). Enforcement often requires a buttress of instruments

such as courts, police, financial institutions, the legal profession, land surveys, cadastral and record keeping systems, and land titling agencies.

Tenure systems can be categorized on the basis of those who enjoy exclusive rights. On this basis all tenure systems fall into four broad categories: open access, communal, private and state. For practical purposes, there are few areas left in most countries that are truly open access. As a general observation, some land may appear or behave as open access but such land is usually state land or communal land. When the state or community lack adequate legal and enforcement capacity, or such capacity comes under pressure, the resultant insecurity of tenure is evidenced through land use patterns that mimic open access systems.
Exclusivity (to either an individual or a group) therefore defines the degree of tenure security. Under communal tenure, exclusive rights are assigned to a group. Individual or family rights are also assigned under most traditional tenure systems. This explains why Migot-Adholla et al (1991) have argued that indigenous African land rights systems have been incorrectly represented by most foreign anthropologists, colonial administrators, as well as some nationalists ideologues who view these systems as static polar contrasts to Western property rights systems. Private property rights are the most prevalent form of tenure in industrialized Western Countries. As alluded to earlier, private land rights are not God-given or sacred rights, but rather private property is a creation of the state. After all, private property is not and cannot be an absolute right (Dorner, 1992).

> "It is not very helpful nor is it accurate, to say that private property and enterprise made the United States great and that this is what the United States has to offer in the struggle for economic development around the World. In fact, it is our open and flexible political system that has allowed us to make private enterprises within the United States consistent with the general public interest, as Marx thought it would never be. However, there is no reason to expect that private enterprise will automatically function in the public interest in a system lacking political institutions and the middle-class society in which they rest." pp 10

We will discuss later the fact that where private property rights are not viewed as legitimate, or not generally viewed as working in the public interest, or where they are simply not enforced adequately, *de jure* private property becomes *de facto* open access.

Under customary tenure, traditional inheritance and succession laws supersede the implied statutory law of intestate inheritance. This can create problems with registered title, particularly, in most patrilineal African societies, where registered title usually means the individual name of the male head of household appearing on the title. As a result of such title in negotiable property, women and dependent children are often prejudiced when property is let or foreclosed on business they were not party to. Under most African cultural laws, the male may be head of the family but the land is property belonging to the whole family. Wives and dependent children, therefore, should have inalienable rights to sub-division or inheritance. As a minimum therefore, the immediate family have to be party to or concede to any land transactions or mutations that may affect their immediate and/or future rights, or interests. The cultural laws and practices of family rather than individual rights, are the basis of Africa's celebrated social security system; a

system that is still relatively cost-effective and unlikely to be replaced by state social security system for quite some time into the future.

State land is often used by the public sector, but more importantly for our discussion, most land under *de de facto* indigenous or customary tenure, is usually *de jure* designated as state land. This situation poses the most serious source of tenure insecurity or lack of exclusivity.

Table 1: **Categories of land tenure systems**

CATEGORY	OWNERSHIP OF EXCLUSIVE RIGHTS
Open access	None
Communal	Defined group
Private	Individual legal entity
State	Public sector

Institutions, or rules of the game and how the rules are applied, are most important in determining how secure rights are, and this goes for all tenure systems. Ultimately, and in the abstract, there is no tenure system that is good or bad, right or wrong, but rather that any tenure system has to be secure, appropriate and able to facilitate the needs of a community or society.

3. GOVERNANCE ISSUES AND IMPLICATIONS

The majority of Africans hold their land under indigenous customary land tenure systems irrespective of the formal legal position under national law (Bruce, Mighot-Adholla and Atherton, 1993). Most African governments, however, designate traditional land as state land. Most governments accept the *de facto* prevalence to customary tenure, while at the same time maintain the *de jure* state ownership, which in turn allows bureaucrats, politicians and influential people to exercise privilege and authority over traditional land and rural communities. Some governments have attempted to replace customary tenure with state guaranteed individual rights (registered titles). The general experience, however, has been that due to weaknesses of government institutions in Africa, state imposed individualized tenururial systems do not necessarily offer greater security for African land users.

Communal tenure and common property management

African land tenure systems have erroneously been explained through the notion of “tragedy of the commons”. This is because observers believed that these systems of land tenure assign land rights to the community, and ultimately land users won’t risk long term investment into improving the land and land based resources. More careful analysis of traditional tenure systems, however, shows that this tenure is composite, with clear freehold rights usually for arable and residential land, as well as group rights for pastures, forests, mountain areas, waterways, sacred areas and so on. The robustness of the tenure system, however, is dependent on the strength of the traditional institutions in place, and degree to which state and other local government institutions interfere or supercede traditional rights and administrative process.

Most African governments, after political independence from colonial masters, have maintained the colonial legacy of inadvertent undermining of indigenous tenure systems. This has been so through two major approaches. Most prevalent is the practice that all land with no registered title

is *ipso facto* state land. The second approach is the attempt to replace customary land tenure with state-imposed individual property rights to land. This change, it is assumed, is more compatible with the intensification and commercialization of agriculture. There is mounting evidence, however, that land titles and registration programs have generally not yielded positive benefits. Moreover, formal title did not necessarily mean an increase in tenure security (Roth *et al*, 1989).

There is also growing evidence that indigenous tenure systems are dynamic and evolve with changing social, economic and political circumstances. Boserup (1981) and Feder and Noronha (1987), provide evidence collaborated by Bruce, Mighot-Adholla and Atherton (1993) that customary tenure rights evolve towards more inalienable individual rights as population pressure increases and as agriculture becomes more commercialised.

Legal and administrative processes
A fundamental problem is the clash between customary laws governing tenure, *vis-à-vis* statutory laws which are often based on European or North American legal principles. A general observation is that customary laws always tend to confer greater recognition to group rights, whereas Western laws emphasize individual rights. These differences also lead to further differences in other elements of property rights institution such as inclusion, exclusion, succession and inheritance.

The need to decentralize government and strengthen traditional institution (including the ability for conflict resolution)
Highly centralized systems of government were judged as the most serious threat to tenure security for land users under all types of tenure in Zimbabwe (Rukuni, 1994). This problem is more serious for communally held land and state land occupied by communities under customary rights.
Communities occupying such land have limited exclusivity of rights because state bureaucrats and related politicians also claim institutional authority over such lands and, in the worse of cases, these state functionaries may be the *de facto* landlords. Ministries of Local Government in most African countries have responsibility for enforcing the state controlled system and often subordinate traditional structures to the state bureaucracy. In come cases, Kenya for example, traditional leadership structures were dismantled after independence. To varying degrees, these traditional leadership structures have been weakened or disenfranchised after independence. The political justification for this has been the historical association of traditional leaders with colonial administration.

An illustrative case to decentralization and empowerment of local communities is the CAMPFIRE program in Zimbabwe and also under adoption in a few other Southern African countries. CAMPFIRE is the Communal Areas Management Programme for Indigenous Resources. Under CAMPFIRE local communities manage and utilize their natural resources to their exclusive economic benefit. This approach has been most effective on the management of wildlife held on communal land. Because of the financial incentives to the communities, these communities now take initiative to protect and conserve the wildlife that in the past they would poach. However CAMPFIRE has shown that while delegation to district level brings some benefits to communities, this needs to be devolved further to the community itself. This experience confirms

the need for greater empowerment of communities over the conservation of their environment. This is only possible through delegation of responsibility and authority, and creating administrative and institutional mechanisms that are legitimate, effective and accountable in the control of land use and natural resource utilization. Rural communities, therefore, can own and utilize common property resources effectively and sustainably provided there are clear benefits to the community and that the community is empowered through local level institutions.

Land tenure and economic efficiency

A growing body of research based knowledge on tenure demonstrates that the most important characteristic of tenure security under indigenous systems is the ability to bequeath land. Pace, Roth and Hazell (1993) examined existing studies by the World Bank and the Land Tenure Center, and they also studied a number of African countries to end up with comparative analysis of Burkina Fasso, Ghana, Rwanda, Kenya, Senegal, Somalia and Uganda. This analysis confirmed that indigenous systems do not hinder productivity or investment. In addition, land registration has not necessarily led to tenure security. Government intervention, therefore, makes sense only after establishing causes of tenure insecurity, and also bottle necks to rural development. As productivity of land and natural resources increases, agriculture becomes more commercialised and as population densities increase than appropriate registration effort they bear positive results. The same may apply when land grabbing by powerful elites is unchecked. Research demonstrates that the high productivity increases enjoyed by smallholders in Kenya and Zimbabwe had less to do with individual tenure, and owed more to the removal of other bottlenecks for smallholders.

4. CONCLUSION

Land tenure is a complex issue that should be allowed to develop or evolve with changing socio-economic and cultural conditions of a given community. Traditional or customary tenure systems offer as much security as any other system provided that communities have legal ownership and authority over their land and natural resources. Governments can strengthen this tenure system by supporting and empowering local communities. Highly centralized systems of governance combined with bureaucratic top-down decision making systems tend to impose decisions on people at the grassroots level. This system of government is weak in terms of effectiveness and impact, accountability and transparency, and it denies people the chance to be self-innovative.

Governments have to fully understand traditional and indigenous tenure systems before radical attempts to alter them for whatever reason, be it ideological or purely political. These tenure systems have survived a century of neglect, abuse and exploitation by colonial and contemporary governments. Above all, these tenure systems require support to strengthen local institutions and empower local communities in administering tenure, including the ability of the tenure system to evolve over time. Tenure security in terms of exclusive rights of groups and individuals, it has been argued, are the very basis of political and social power and status. When such rights are overly subordinated to the state, it follows that the political rights of the rural people are diminished, and that the democratic processes and institutions are undermined. This then is a major cause of tenure insecurity, with resultant negative impact on agricultural productivity and the management of natural resources, particularly on communally held land.

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Appendix Four

RESOURCE TENURE, RURAL DEVELOPMENT AND ZIMBABWE'S COMMUNAL AREAS

Emmanuel Guveya and Kay Muir-Leresche

1. INTRODUCTION

Zimbabwe is a country dependent on the exploitation of natural resources for development. The country is generally characterised by acute natural resource inequities and crisis: shortages of water, land, fuel, fodder, power for cash-crop agriculturists, power and water for industrial production and lack of access to finance, technology and skills. The inequities and shortages have generated a variety of environmental pressure points and conflicts as different interest groups and communities exercise competing claims over scarce resources. The conflicts in many instances show no signs of abatement and have affected the quality of human life and the natural environment. For the country to develop and address the concerns of poverty and equity it must achieve significant levels of economic development. Such development requires optimal use of natural resources. However, erratic rural economic growth is today translated into pervasive poverty, hunger, unemployment and environmental decline. It is now widely accepted that rural economic development is ultimately dependent on building strong and effective rural institutions and empowered communities (Rukuni, 1998).

This chapter is premised on growing evidence that agricultural growth and efficient management of natural resources are dependent on the political, legal and administrative capabilities of rural communities to determine their own future and to protect their natural resources and other economic interests (Rukuni, 1998). The lack of this power, and often the lack of democracy, is the result of insecure tenure rights which also result in abuse of common property resources, disenfranchisement of rural people, particularly women, and the breakdown or weakening of rural economic institutions. This chapter will concentrate on the issues relevant to communal areas, but the principles are applicable to the resettled areas and the specific issues relevant to tenure for resettled farms are briefly addressed.

2. LAND TENURE, LAND REFORM AND PROPERTY RIGHTS

2.1 Distinguishing Land Reform and Land Tenure Reform

For purposes of this discussion, it is important to differentiate land reform from land tenure reform (Matovanyika and Marongwe, 1998). Land reform encompasses any change which redistributes land. Land reform often involves restructuring patterns of wealth, income flows, social status, and prestige. Land reform is a revolutionary process and passes power, property and status from one societal group to another. Land tenure reform, on the other hand, involves changes in the rules that govern land and related property rights. The more secure these rights the more likely it is that the resource user will take a long-term perspective investing in the resource rather than in mining the resource for strictly short-term gains.

2.2 Property Rights and Tenure Regimes

Various types of tenure, including registered title, can be secure or insecure depending on social, legal and administrative institutions in a given society. Security of tenure is associated with the four sets of rights outlined below, using land as the example:

- **use rights:** are rights to grow crops, trees, keep livestock, make permanent improvement, harvest trees and fruits, and so on;
- **transfer rights:** are rights to transfer land or use rights, i.e., rights to sell, give, mortgage, lease, rent or bequeath;
- **exclusion and inclusion rights:** are rights by an individual, group or community to exclude others from the rights discussed above; and
- **enforcement rights:** refer to the legal, institutional and administrative provisions to guarantee those rights.

Institutional arrangements include instruments for defining and enforcing property rights, be they formal procedures, or social customs, beliefs and attitudes determining legitimacy and recognition of these rights. Enforcement often requires a buttress of instruments such as courts, police, financial institutions, the legal profession, land surveys, cadastral and record keeping systems, and land titling agencies.

Tenure systems can be categorized on the basis of those who enjoy exclusive rights. On this basis all tenure systems fall into four broad categories: open access, common property, private and state (Table 1). Some land may appear or behave as open access but such land is usually state land or community land. When the state or community lack adequate legal and enforcement capacity, or such capacity comes under pressure, the resultant insecurity of tenure is evidenced through land use patterns that mimic open access systems. Table 2 summarises the distribution of land by natural region as of 1989 (CSO, 1989).

Table 1: Categories of land tenure systems

CATEGORY	OWNERSHIP OF EXCLUSIVE RIGHTS
Open access	None (or effectively uncontrolled)
Common	Defined group e.g. Communal areas but not strictly common property regimes since the legal rights remain with the State.
Private	Individual legal entity e.g. private farms, company farms, co-operatives, multinationals
State	Public sector e.g. ADA, CSC, National Parks resettlement and leased land

Communal area tenure in Zimbabwe has two major components. The first component comprises arable land and residential land which is held under traditional freehold tenure with rights to sub-divide for family members and to bequeath or inherit. The second component comprises communal tenure for the grazing and forest resources. Land on lease in the small and large scale commercial sectors as well as resettlement areas, is state land. Freehold title is usually awarded by the state after a land user leases land for a prescribed period during which certain levels of investment and production are required before a title deed is awarded. After titling the land owner has rights to dispose of the land without further reference to the state. Some state agencies, e.g. National Parks, ADA, and Forestry Commission occupy and use state land (Rukuni, 1994). Thus, in Zimbabwe, land is predominantly owned by the State but most of this land is allocated to communal farmers under a system which involves *de facto* traditional rights to farmers although the State retains *de jure* jurisdiction. A significant portion of the land is

alienated and held under private ownership by large-scale farmers. The State has been involved in obtaining land from the commercial farmers for redistribution and by 2000, some 20-25% of the land was still owned by large-scale farmers.

Table 2: Land Classification by Natural Region ('000 ha)

Natural Region	Communal Lands	Large Scale Commercial	Small Scale Commercial	Resettlement Area	Parks and Forestry	ARDA	Total
I	140	200	10	30	310	10	700
II	1 270	3 690	240	590	60	10	5 860
III	2 820	2 410	530	1 240	130	160	7 290
IV	7 340	2 430	500	810	3 649	60	14 789
V	4 780	2 490	100	620	2 190	260	10 440
Total	**16 350**	**11 220**	**1 380**	**3 290**	**6 339**	**500**	**39 079**

Source: CSO (1989), Statistical Year Book

Tenure in the privately-owned sector was relatively secure until 1998, and most resettled land was obtained under a willing-seller, willing-buyer basis, despite legislation introduced in 1992 which gave government the right to obtain land compulsorily, albeit with full compensation. This security is reflected in strong investment in the large-farm sector from 1980-98 and strong growth in those years without drought. However the transfer rights of farmers in the private sector were limited and farmers were unable to subdivide and sell or even give away portions of their land without specific permission. From 1982-1992 over 86% of the applications for subdivision were rejected (Rukuni, 1994). Given the high transaction costs and low probability of success, few farmers even attempted to subdivide. This tenurial restriction has severely hampered both growth and equity in the sector since it made it impossible for idle land to be released in response to changing economic and social circumstances. These restrictions have also contributed directly to the political, social and economic problems at the turn of the century. The insecurity that has followed has resulted in dis-investment in the large-scale farming

sector and increased pressure on arable land, forest and wildlife resources as farmers maximize short-term gains.

Tenure in the smallholder resettled areas is very insecure. The state retains all rights to the land and the resettled farmers use the land on a permit basis that can be revoked annually. In practice the rights have seldom been revoked and the farmers operate in a similar fashion to those in the communal areas. It is, however, very much more difficult to develop common property systems which are effective when the people involved are not part of a closely-knit social group. There are plans to address the issues and the annually-revocable permits are to be transformed into leases, and in some instance even into opportunities for purchase. The grazing, forest, wildlife and water resources are to remain common property, although Government has been approached in a number of resettlement areas to transform even these resources into individually defined units. The individual large and medium-scale leases granted by government as part of the indigenization process are also characterized by uncertainty since the universality of these property rights is uncertain. Political circumstances may change their acceptance and farmers are reluctant to make large investments until the institutional arrangement with respect to land tenure are universally accepted and enforceable.

2.3 Land Tenure System in the Communal Areas of Zimbabwe

Communal areas in Zimbabwe, as in other African countries, have erroneously been considered insecure through the notion of “tragedy of the commons", i.e. open access. More careful analysis of traditional tenure systems, however, shows that the tenure system is composite, with clear use rights for arable and residential land, as well as group rights for pastures, forests, wildlife, waterways and sacred areas. In Zimbabwe the State retains ownership of the trees, water and wildlife, but usually allocates these rights to the District in which the community resides. Designated leaders such as chiefs and kraal heads allocate use rights on portions of land to individuals or families for their exclusive use. Under these arrangements the user cannot alienate or transfer use to another individual. Under the customary tenure system land cannot be sold or mortgaged. However, under increasing population pressure and commercialization of agriculture, there is a tendency for communal property regimes to evolve towards more inalienable individual rights

(Gaidzanwa, 1988), and this appears to be the case in communal areas close to urban centres such as Chinamora where use rights are "leased" out. In addition access to community land is being "sold" to those with little or no traditional claim and land conflicts are becoming a problem.

The majority of Zimbabweans hold their land under indigenous customary land tenure systems irrespective of the formal legal position under national law (Bruce, Migot-Adholla and Atherton, 1993). The government of Zimbabwe, however, designate traditional land as state land. The government accept the *de facto* prevalence of customary tenure, while at the same time maintain the *de jure* state ownership, which in turn allows bureaucrats, politicians and influential people to exercise privilege and authority over traditional land and rural communities. This situation poses a serious source of tenure insecurity or lack of exclusivity. It also leaves communal farmers vulnerable to the State since they are unable to hold them to account through the courts. This was made obvious in the case of the people removed from the Osborne dam. They were moved to less fertile conditions, the compensation was set low and the delays in payment and inflation made the final payments negligible. As the State has *de jure* control of the land, challenging relocation and the compensation offered becomes very complicated. In addition the insecurity reduces the potential for using land to create asset value.

2.3.1 Communal tenure and administrative systems

The robustness of the communal tenure system is dependent on the strength of the traditional institutions in place, and the degree to which state and other local government institutions interfere or supersede traditional rights and administrative process. With political independence from the colonial masters, Zimbabwe maintained the colonial legacy of inadvertent undermining of indigenous tenure systems (Rukuni 1994). There has been pressures for land titling, even in the communal areas. This titling, it is assumed, is more compatible with the intensification and commercialization of agriculture. There is mounting evidence, however that land titling and registration programs have generally not yielded positive benefits (Rukuni, 1994). Moreover, formal title does not necessarily mean an increase in tenure security.

For any property regime to function it has to be backed by effective administrative and policing systems that ensure compliance. Additionally, there has to be an authority system that ensures fairness in allocation of national assets and that can preside over and manage resource-based conflicts. If the authority system is weak, becomes rent seeking or breaks down, then resources cannot be managed sustainably and any property regime can degenerate into open access. The increasing land and natural resource-based conflicts being witnessed in Zimbabwe are fuelled in large part by the weakness of land and natural resource administration institutions (policies, laws), lack of clarity of institutional roles and responsibilities and poor enforcement of existing laws and regulations (Moyo, 1995). The basic premise is that a property right denotes a set of actions or behaviour that an owner can/may not be prevented from pursuing. The role of the state or where such authority has been devolved to the local leadership of a village, is to protect such rights.

The fundamental issue concerning communal tenure relates to problems arising with respect to land allocation, natural resource management, access to resources including water and to conflicts between different social groups. There is much confusion surrounding authority to allocate land and/or approve leases and permits. The situation is compounded by the presence of numerous interest groups ranging from state, public enterprises, district councils, entrepreneurs, migrant workers and landless households all competing for land and natural resources. These competing demands also put pressure on the local institutions and limited financial resources with respect to control, regulations and planning.

2.3.2 Legal, traditional and *de facto* rights to allocate land in communal areas

The communal Land Act of 1982 vests ownership of communal land in the president. The Act assigned land administration to district councils rather than chiefs and headmen (Bruce, 1990). This legal position was one of several swings of the pendulum. An attempt by government to assume control of land administration from traditional authorities under the Native Land Husbandry Act of 1951 failed, with *de facto* control shifting back to the chiefs and headmen by the early 1960s and full legal control of land restored to them by the Land Tenure Act of 1970. The 1992 Land Act again vests full control of land administration to the chiefs and headmen.

Whilst it appears that the land allocation functions of the district councils may sometimes be carried out by ward development committees (WADCO) or village development committees (VIDCO)[1], formal delegations have not generally been made. In practice, to an extent which is unclear, chiefs and headmen continue to allocate land. Headmen are sometimes elected to positions in the VIDCOs, and it is uncertain which source of legitimacy they are drawing on making land administration decisions. Thus there is need for clarification of who the responsible authority for land administration is.

3. SECURITY OF TENURE

Any critique of communal land tenure tends to focus on lack of security of tenure, which, it is suggested, weakens the incentive to invest in agriculture. Just because under customary tenure land cannot be sold and thus cannot be mortgaged, communal tenure has been seen as a constraint to obtain credit for investment (Bruce, 1990).

The major cause of tenurial insecurity in Zimbabwe's communal lands is the absence of devolution of planning, decision-making, resource mobilisation, enforcement and administration of all matters relating to the affairs of local authorities. Moyo (1995) describes this as lack of local sanction with respect to decisions affecting communities such as regulations, plans, land allocation and various other sanctions imposed by state agencies such as forest and agricultural agencies. Local communities do not have the rights to question the legitimacy of state interventionism. Below is a review of some of the factors that are critical for smallholder agricultural development and their relationship with security of tenure.

3.1 Credit Security, Asset value and Community Property

Many development thinkers have attributed the weakened incentives to invest in agriculture to the absence of security of tenure to land ownership. If farmers are unable to sell their rights to land then they cannot invest in a resource with the anticipation that they will derive the benefits from the increased value of the resource in the future. In most communal areas the farmers have security that their families will continue to farm on that land and, therefore, will make some investments and will usually avoid, where

[1] The WADCO and VIDCO are structures of the local government into which districts were divided after

feasible, any practices that undermine the resource. They will, however, limit their investments to those which will increase their immediate productivity but will not have the additional investment incentive created by the increased value in the asset since they are unable to capitalise on it by selling it. The investment problem for the resources held in common (grazing, forests, water, etc) are very much greater and it is to these resources that much of the focus is directed in the next section of the paper.

The inability of smallholder farmers to use "their" land as collateral to borrow the much needed short and long term credit for investment in agriculture denies most of them access to both fixed and variable inputs and to modern technology like hybrid seed, fertiliser, equipment etc. This in turn leads to low productivity and unsustainable agricultural practices. Their counterparts, large-scale commercial farmers have title to land that they can use for accessing credit facilities.

With the use of land as collateral for smallholder farmers to access production credit, the issue is two fold. Firstly, smallholder farmers may be reluctant to apply for loans for fear of losing their land through foreclosures. Also farmers may fail to apply for loans due to the unattractiveness of investment opportunities (Platteau, 1995). For example, an individual farmer might not be willing to invest in capital equipment to dig furrows or contour ridges when family labour is sufficient or is in excess. Secondly, imperfections may arise in the land market rendering land titling ineffective as reliable collateral or society is just unwilling to accept the new system as legitimate. Thus credit suppliers will be unwilling to offer loans to smallholders, as it will be very difficult to disposses in case of default.

An important point to note is that secure tenure to land ownership is not the only reason why financial institutions are reluctant to loan to smallholders (Bruce, 1995). Among other reasons they consider credit worthiness, which encompasses: good savings record, repayment of previous loans, reliable non-farm income streams etc. Beyond this commercial banks look for larger opportunities than those that the smallholder farmers can provide, opportunities in which administrative costs of making a loan are/or in proportion to the size of loan, and repayment schedules are feasible which might be too short to permit recovery of the cost of capital investments in a farm. Financial institutions

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independence. A VIDCO is approximately 100 households, six VIDCOs constitute a WADCO

are also worried about political interference, which might make it difficult on foreclosures for those who are politically connected in case of default on loan repayments.

Issuing individual titles in communal communities may improve neither the security of tenure nor access to credit, although individual titles would be helpful to avoid barriers to the emergence of rental markets within the community. Until the restrictions on transfers to outsiders are eliminated, a community title could be issued to ensure the community's security of ownership against well-connected outsiders. This is particularly important with respect to tree, grazing, wildlife and water resources and may become important for both homestead and arable land. Rukuni (1994) advocates registering land as "corporate property" belonging to the entire village as a way of decreasing the costs associated with titling while reaping many related benefits such as insurance, flexibility of land allocation, and the utilization of genuine scale economies in subsidiary activities.

3.2 Land Titling and Efficient Resource Use

The allocation of land through the indigenous system is argued to be inefficient (Bruce, 1995). With proper recording of private property rights there are allocative effects resulting from the efficient use of the land available and dynamic effects resulting in land conservation and improvement (Platteau, 1995). Efficiency in land use result from a number sources. Firstly, more efficient crop choices are possible through the removal of bias towards short term cycle crops (arising from insecurity of tenure). Secondly, land can be transferred from less to more dynamic farmers and consolidation into larger holdings. This eliminates the excessive fragmentation and subdivision encouraged by traditional systems. The dynamic impact of land titling, can be explained by the fact that legally protected land owners can be expected to be both more willing and able to undertake investments if they are assured of reaping future benefits of their present efforts and sacrifices. Incentives exist for farmers to invest in soil conservation, land improvements and other operations that increase productivity in the long term, hence sustainable agricultural development. In addition legally protected landowners can use their land titles as collateral for the much-needed short and long term credit required for investment and production.

Security of tenure through land titling does not only increase economic efficiency (Platteau, 1995). It can provide the government an avenue for assessing property taxes and hence develop a revenue base. The easy identification of possessors of rights of each and every land parcel enables the government to resolve land disputes or complaints without many hassles and can form the basis of a law and order framework.

3.3 Communal Tenure as a Social Safety Net

An important point to note is that in rural Africa, land is not only an input in agricultural production. It is a social security safety net, fallback position for retirement and unemployment and where families gather for celebrations, holidays and bereavement (Muir-Leresche, 2000). Most urban dwellers in Zimbabwe have a rural home, although they earn a living outside agriculture. The emotional, political, social and historical attachments to the land make it very difficult for security of tenure to land ownership to trigger the emergence of a vibrant land market as the holding transcends economic considerations.

Despite the advantages of land titling and private ownership, tenure insecurity on its own does not seem to be a binding restriction for sustainable agricultural production (Place, Roth and Hazell, 1993). The case of Zimbabwe illustrates this point. At the onset of independence, smallholder farmers experienced an agricultural revolution without any major land reforms, with land ownership still under common property. Maize yields increased from an average of 0.7 tonnes per ha to 1.5 tonnes per ha between 1980 and 1982 (Mashingaidze, 1994), when agricultural policy, rather than tenure policy focused on smallholder agricultural development.

Another case for community titles concerns common property resources, such as communal pastures, forests, or other marginal lands. Such areas constitute an important safety net for the poor that may be particularly important in high-risk environments where alternative means of insurance are unavailable. Community mechanisms for managing common property resources have tended to weaken with economic development. But the preservation of common property resources could be desirable from an equity perspective since privatizing these lands takes away a part of the social safety net for the rural poor. Providing a community title for these lands can protect

communal rights from outside encroachment and prevent the poor from being excluded from communal property use (Rukuni, 1994).

3.4 Resource Tenure and Devolution of Tenure

The highly centralised system of government was judged as the most serious threat to tenure security for land users under all types of tenure in Zimbabwe (Rukuni, 1994). This problem is more serious for communally held land and state land occupied by communities under customary rights. Communities occupying such land have limited exclusivity of rights because state bureaucrats and related politicians also claim institutional authority over such land and in the worst of cases these state functionaries may be the *de facto* landlords. The Ministry of Local Government has responsibility for enforcing the state controlled system and often subordinate traditional institutions to the state bureaucracy. Traditional leadership structures were dismantled after independence. The political justification for this has been the historical association of traditional leaders with colonial administration. There is a need to recognize/codify traditional laws, or at least the key values and principles, as well as learn from world-wide problems surrounding indigenous peoples and their land rights. Recently, the traditional leadership in Zimbabwe has been reinstated but their land allocation role remains unclear and challenged by both centralised and district bureaucracies and political institutions.

The argument for devolution of power to local authorities assumes that such proprietorship will lead to improved land and resource management. However, the main reason for lack of devolution is that those in power do not want to loose power.

3.5 Land Tenure and the Position of Women

Although literature has widely acknowledged the role of women in agriculture and agricultural development, they have been rarely considered in land and natural resource allocation. Boserup (1970) describes sub-Saharan Africa as a region of female farming excellence. Women perform most of the agricultural work in addition to their reproduction roles. Labour division studies in Zimbabwe's in precolonial times indicate that most agricultural labour was provided by women, with men only participating in duties which required strength such as groundbreaking Although access to some services have significantly improved after independence, the social structure which governs women

participation in agriculture remains more or less the same (Muchena, 1994). Women are a critical element in providing labour and a source of knowledge on land and are the key managers of natural resources such as trees and water. Hence there is a great need for women's rights to be included in land and natural resource allocation.

Generally, women are in a weaker legal position than men to gain access to land Their rights are often only indirectly defined - usually through their husbands (Moyo,1995). They obtain land rights through their role as daughter, sister or wife, i.e. by birth or marriage. Women are, for the most part, exempt from the possibility of having comparable (to the men) permanent and secure rights for land use in land tenure in the patrilineal society found in Zimbabwe. They can typically only access secondary rights[2]. In the case of divorce, women must often abandon the fields they have been cultivating. An unmarried daughter who invests in building a house or in land on her father's property risks eviction when the land passes to her brother on the death of her parents. According to traditional law, single divorced or widowed women, sometimes have some minimum social security through secondary rights on their family's land. Usually in the event of the death of the landholder, the land is divided among the sons of the deceased, though land may be given to married or widowed daughters . Widows are usually disadvantaged by the customary inheritance patterns.

As Moyo (1995) notes, the demands of women for greater equity and access to land presents a serious challenge to the present politics which continue to be dominated by patriarchal sensitivities of male dominated governments. The participation of a small yet increasing number of women in regional governments has not pushed the land agenda forward since the preoccupation has been more with overall equality of women than with land rights. There is however, debate over this issue as some view the traditional land tenure systems as secure, especially for women (Barry, 1998).

[2] Matrilineal rules must not necessarily mean that women have more rights, but that men gain access to land via the mother's side of the family.

4. TENURE AND LAND RESETTLEMENT

Settlement and resettlement refer to the planned transfer of people to areas, the agricultural potential of which has not been fully utilized, or in order to change existing social and economic relationships. Settlement and resettlement involve projects designed to gain land through irrigation, drainage or clearance of forest, and projects designed for land use intensification by dividing extensively used large landholdings into smaller units. These projects occur spontaneously or through promotion by the government.

4.1 Spontaneous Settlements

Spontaneous settlement is initiated by the settlers themselves and is carried out without support by the government. Spontaneous settlement in rural and urban areas often follows governmental road construction measures. In rural areas this type of settlement takes place on governmental forest areas as well as on poorly utilized large private landholdings. These settlements frequently do not have an appropriate legal status and are often found on marginal land. Lawlessness and a high risk of expulsion lead to rapid exploitation, deforestation and soil degradation in many cases. This highlights the need to establish systems to either prevent such settlements, or where inevitable or appropriate, to provide for secure tenure to the resource users. Zimbabwe's government sponsored spontaneous settlement will need to clearly address tenure and administration issues to avoid environmental degradation and encourage efficient resource use. The key will be transparency in order to ensure universal acceptance of the allocated rights.

4.2 Resettlement Tenure Issues

Any tenure arrangement in the resettlement areas would need to safeguard against settlers eventually retiring from active farming and taking the land out of production. There is need to strengthen the tenure arrangements under resettlement to encourage farmers to invest in the long-run productive capacity of the land allocated to them. Possible options in this respect would be (Cusworth, 1990):

- a rolling, inheritable leasehold system, which allow the lease to be withdrawn (over a suitable period) if the land were to remain underutilized for a defined number of years.

- A land tax, or lease rental, that would ensure that it would not be financially feasible for a household to occupy the land without putting it to some productive use.

5. TENURE AND OTHER RESOURCE USE

In the communal areas, insecure land tenure restricts the devolution of property rights over other natural resources to the people living with, and using, these resources. The main issue is who has the right to benefit from "exploitation" and who pays the "cost" of the continued existence of the resource. There is an urgent need to localise tenure and to develop and reinforce common property systems which grant residents a much closer link in the management, control and benefits of "their" resources. This section focuses on tenure issues as they relate to the following specific resources: wildlife, forestry, grazing, and water.

5.1 Tenure and Wildlife

In the first 70 years of colonial control, tsetse-fly eradication, the Rinderpest epidemic, ivory and hunting reduced wildlife numbers. Veterinary controls, "pest" eradication and commercial poaching contributed to the decline but wildlife was, and remains, most seriously threatened by habitat loss in favour of conventional cropping and livestock husbandry.

Zimbabwe has seen a significant increase in wildlife numbers and the growth of a wildlife industry since Independence. The underlying factor for this success is the National Parks and Wildlife Act of 1975. The Act effectively transferred wildlife usufruct rights to owners and occupiers of alienated land. In 1982 the Act was amended to allow the Minister to devolve authority over wildlife in the communal areas to a district council which meets required conditions for wildlife management. The rationale for devolving use rights was to provide incentives for farmers to manage wildlife, thus promoting habitat and animal conservation.

The successful increase in wildlife in the large-scale sector and the higher returns from wildlife, encouraged government to initiate formal wildlife utilisation in the communal areas. CAMPFIRE (Communal Areas Management Programme for Indigenous Resources) was established in order to administer the devolution of

appropriate authority over wildlife to communal farmers. However, these property rights could not be divested to communities living with wildlife, since the only legal entities were at the District level (District and later Rural-District Councils)[3]. The guidelines propose that at least 50% of the benefit from the wildlife is passed to the producer communities. The devolution is to district level, rather than user-level, so that costs and benefits are still imperfectly linked. CAMPFIRE has, however, resulted in a far greater awareness of the potential of wildlife for development and has seen some areas encouraging habitat and wildlife protection.

The Land Tenure Commission recognised CAMPFIRE's potential as a development agency, particularly if land tenure was defined more closely at community village level. This would support CAMPFIRE and spread its impact to other natural resources leading to more sustainable development. In many areas there has been increased co-operation with local communities against poachers, especially external, commercial poachers. However, those actually living with the wildlife are still paying costs greater than the benefits they are receiving (Murindagomo, 1997, Bond, 1998). Thus although the district, the nation and the international community benefit from wildlife incorporated in the land use system, it is unlikely to be sustainable unless the people most closely involved in both wildlife and habitat conservation have more control over the resources (Bond, 1998). Until local communities are recognized as legal entities with tenure over land and natural resources, wildlife property rights remain insecure and controlled by institutions divorced from the daily reality of living with wild animals. The evolution of CAMPFIRE has reflected the difficulties and fears of allocating tenure to a fugitive resource in communal areas, to the problems arising when *de jure* ownership of land and other resources are vested in the State, and from the administrative conflicts between overlapping state agencies. These issues are investigated in more depth by Bond (1998).

The granting of tenure over wildlife directly to the people bearing the costs of living with wildlife in the communal sector has not been achieved. There has been some

[3] In many Districts only some wards have any large mammal populations and even within these wards, sometimes only a few of the villages are actually living with the wildlife. Districts are in the region of 6000 km2 while wards are in the region of 500 km2 although this varies greatly. Less than half the wards in Districts with Campfire actually produce wildlife. This varies from all wards in Nyaminyami to only 2 out of 29 wards in Gazaland. In 1993 about a quarter of the population living in districts with Campfire

success in devolving responsibility from Central to local government but there is a reluctance on the part of local government do devolve further to the "producer communities". Part of the difficulty arises from the lack of legal bodies at producer level, but this could be overcome by the formation of companies, co-operatives or conservancies. It is the lack of security of these communities over land and other natural resources which makes effective devolution over wildlife usufruct rights, difficult. A similar situation exists with indigenous woodlands, where Districts retain control over commercial use, and local communities have insecure rights to their trees.

5.2 Tenure and Forestry

The current status of forest resources and their institutional arrangements are a reflection of the country's agrarian history. The importance of forests to agriculture, grazing, irrigation and wildlife have been undermined. Agricultural research and extension have not recognized the integral role of forests in rural livelihoods and the opportunity costs of their destruction is seldom included in assessing the viability of various production options. Inadequate and inappropriate policies and legislation have discouraged sustainable use of indigenous woodland resources. Colonial natural resource legislation and land use planning relied on bureaucratic and technical, regulatory controls, primarily administered by the Forestry Commission, alienating and undermining traditional institutions.

Despite this, many traditional institutions have proved to be resilient, especially where the local community is a cohesive social unit. Some communities have been actively establishing controlled systems and are making some investment in woodland management, despite the insecure tenure. These communities would like institutions which legitimize this control and also provide effective policing for exclusion[4]. In the communal areas, where the State is the *de jure* owner, the trees and all the woodland resources may be legally accessed by any person provided that it is for their own use

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came from wards producing wildlife, although in many cases much of the benefit was spread throughout the districts. (Bond, 1998).

[4] In a case study in Seke communal areas, where the study communities have managed to control and allocate use and conserve their woodlands in the presence of insecurity, respondents advocated for tougher government laws and monitoring by hired personnel recruited from outside the community to avoid corruption and inter-community conflicts (Guveya, Katerere and Muir, 1998).

(Communal Land Forest Produce Act Chap. 19:04). The restriction of woodland products to "own use" fails to recognize the potential of these woodlands to generate incomes for local farmers and perpetuates the emphasis on a subsistence economy, denying rural areas opportunities for development. It undermines their rights of exclusion discouraging investment in indigenous woodlands.

Until 1987 commercial wood harvesting permits were granted and controlled by the State with all benefits accruing directly to the Treasury. Subsequently, appropriate authority over indigenous woodlands has been granted to the Rural District Councils who then retain the revenue generated, although the setting of quotas, allocation and monitoring of permits and harvest remain with the Forestry Commission which charges the concessionaires for the costs involved. Timber concessions are granted to non-residents in communal areas, particularly for hardwoods, and these are allocated by the Districts and monitored by the Forestry Commission. These concessions encourage economic rent-seeking. They have been controversial with villagers disadvantaged by the District, and Districts being under pressure from influential politicians and businessmen. The situation for communal forestry is similar to that pertaining in CAMPFIRE, except that, there is no obligation for the District to devolve any benefits to the local level and no obligation for them to involve the local community in decisions on the use of the forests.

Until the local people are granted secure property rights to their indigenous woodlands, it is only in a few exceptional cases that the farmers will invest in their sustainable use (Katerere, Guveya, and Muir, 1998). The situation has been particularly unclear in the resettlement areas where property rights are even more insecure and where most settlements incorporate people from diverse backgrounds, with no commonly accepted traditional practices or leaders. There is strong anecdotal evidence pointing to widespread deforestation in these areas.

In the State owned forests, there has been little investment or management except for fire guard maintenance, with little investment in indigenous forest research, woodland management or replenishment. In the large-scale sector, farmers may only sell their indigenous timber after receiving a permit from the Forestry Commission.

However, clearing for cultivation and on-farm use is unrestricted (Forest Act Chap 19:05).

In the 22 gazetted forest reserves (800 258 ha), no access is granted except for specifically allocated commercial timber extraction concessions. Thus, the local population that used the area traditionally for gathering (wood-fuel, fruit, vegetables, medicines, fungi, insects, honey and thatching grass) or for hunting or stock keeping, is banned from the core area. However, they still use the forests illegally and enforcement is difficult leading to effectively open access forest land. The displaced forest inhabitants then compete with others (external users) for the diminishing resources. Approaches for a participatory buffer zone management system which confers specific rights to local users in return for protection of the inner core would reduce conflicts between the forest authorities, legal and illegal users and promote sustainable resource use.

5.3 Tenure and Grazing

In Zimbabwe, when the livestock and human populations were low, there were no problems of overgrazing and environmental degradation. As both the livestock and human populations increased to more than the carrying capacity of the environment in the communal areas, grazing land has become a scarce resource. The restrictions on the development of property rights have led to open access.

With open access, no one exercises control over the grazing resources. In the communal areas communities can exclude other communities from using their grazing resources but unclear boundaries often result in conflicts between neighboring communities. Since the property rights to grazing lands are not conveyed to any single farmer within a community, no single farmer can exclude others from exploiting the grazing lands. There are few incentives to protect the resource or invest in it. Members with ancestral ties to the area but who are not actively farming retain their rights to utilize the grazing resources. This is still seen as a positive benefit to residents who can then get access to these animals for draft power (Rukuni 1994).

Hardin's "Tragedy of the Commons" paradigm (Hardin, 1968) has been extremely influential in explaining communal resource use in Africa. Hardin argued that the private benefits of grazing an additional animal on a common range exceed the private costs

because the costs of maintaining the rangeland are shifted onto the group as a whole. This provides an incentive to over exploit and thus degrade the grazing resources. However, Hardin's argument of common property resource degradation only holds under open access regimes and not under common property regimes. Under common property regimes the use rights of individuals can be delimited and regulated such that over exploitation of the resources do not result.

Although common property may be a stable pattern of resource use in traditional societies, population growth, technological change, or rapid climatic change can destabilize traditional institutions. The breakdown of common property in Zimbabwe have led to serious overgrazing (Runge, 1981). Where common property rules break down or fail to evolve to fit changing conditions, several outcomes have been observed. The system either tends to the individualization of common property or to increased resource degradation as the property regime slips towards open access. An analysis of the rules governing grazing resource use in the communal areas of Zimbabwe showed that there are no boundary rules and restriction rules on the use of natural grazing in Buhera, and Chiduku communal areas (Guveya and Chikandi, 1996; Guveya, 2004). The research showed that access to grazing resources is more open access than common property. Due to a lack of well defined boundary and appropriation rules, there is no monitoring of grazing resource use in the communal areas.

An analysis of farmer preference of alternative grazing management strategies showed that the individualization or privatization of grazing is the most preferred in most of the communal areas (Guveya and Chikandi, 1996; Guveya, 2004). This result may be a direct outcome of the clear institutional failure to manage the commons in the communal areas hence the desire to individualize common property resource ownership. However, the individualization of grazing does not necessarily result in the sustainable management of the commons. It is not technically feasible to give individual plots to farmers as these will be too small to ensure adequate feed for the households. Also by individualization farmers will not be able to strategically graze their cattle on different grazing locations during the different seasons of the year (Scoones and Wilson, 1989). Scoones among others, argue that communal area rangelands may not be overstocked. Their argument is based on the unreliability of using the beef cattle carrying capacity

concept which is meant for commercial beef production. Also in the communal areas cattle are supplemented to crop residues during the dry season and for this reason it is difficult to measure correctly what the carrying capacity of the communal areas is. That the issue of overstocking has been alluded to since the 1920 and the cattle herd has increased many folds since then is enough to indicate that the carrying capacity for communal areas has not been attained. Once it is attained, it is argued, at least from a biological point of view, that the cattle herd will naturally stabilize or eventually decline.

The government objectives of increasing cattle off-take from the communal areas is in direct conflict with farmers' objectives where the value of cattle is more closely related to asset value than beef production. When cattle prices rise, this is an incentive for communal farmers to increase their herd. Proposed solutions to the perceived overgrazing problem have been to control stock numbers, restricting access to communal rangeland by means of fences, and management by means of rotational grazing by use of grazing schemes. Evidence shows that most grazing schemes have not been successful in reducing overstocking (MLAWD, 1992). Another policy option being investigated for grazing resource management is the use of tradable grazing rights (Guveya, 2004). It is expected that under this policy grazing use will be efficient, and equitable. By making grazing rights tradable, those farmers with high cattle production costs sell-off their cattle whilst those farmers with low costs of keeping cattle buy grazing rights. Equity is achieved since all farmers, even those without cattle, are allocated grazing rights. Those without cattle then sell their rights to cattle owners.

5.4 Tenure and Water

The main goal of the National Water Resources Policy recommended by the Water resources Management Strategy (WRMS) project is the promotion of sustainable, efficient and integrated utilization of water resources to the benefit of all Zimbabweans. There is currently a wide imbalance in access to water between the communal and the commercial agricultural sectors as the former use 1.3% of the available agricultural water and the latter use about 85% (MRR&WD, 2000). Too many institutions were involved in water resources management and this resulted in an uncoordinated approach to allocation and development as the different bodies had different interests and objectives.

Water development was guided initially by the Water Act of 1927 which was repealed and replaced by the 1976 Water Act. This Act was repealed and replaced by the 1998 Water Act. The major change brought by the 1998 Water Act is to provide for more equitable access to water. Under the 1976 Water Act, water rights were granted in perpetuity. This meant that as more water rights were granted, more water got tied up and this was a constraint to the issue of water rights to new entrants. Water rights could be inherited when the land to which they were attached was inherited. When the land was sold, the water right passed to the new owner. Water rights were issued only for use of surface water. The water rights were linked to land ownership and therefore those who did not own the land could not obtain them. Water rights were obtained for communal area irrigators through District Administrators.

The 1998 Water Act abolished the private ownership of water. All water belongs to the state, even that which emanates and stays on private property. A water permit is required when it is used other then for primary purposes. A permit is issued by the Catchment Council granting entitlement to water use. Water permits are to be issued for a specified period and a period of plus or minus 20 years has been suggested (MRR&WD, 2000). When there is water shortage, the volume of a permit is reduced proportionally. Another major change in the new Act is the recognition of groundwater as part of the hydrological system and the requirement of permits for its commercial use. Under the 1976 Act it was necessary only to inform the Minister when the commercial use was beyond a stated depth. A landowner could utilize underground water at any point on his property.

The new Water Act decentralises the management of water resources to the Catchment level[5]. The Act provides for the appointment of Catchment and Sub-Catchment Councils for all river systems and aquifers. All stakeholders are supposed to be represented on these bodies. Under the 1976 Act, the Secretary was responsible for the preparation of outline plans for water use. Most stakeholders were not involved although some were consulted. The Catchment Council and ZINWA have the responsibility to prepare outline plans for the river system[6]. The Catchment Council is

[5] Under the old Act water rights were issued by Administrative Court.
[6] The plans however still need approval of the Ministry.

responsible for allocation of water (in line with the outline plan) to different sub-sectors for: irrigation, hydropower generation, urban, industrial and mining.

A statutory instrument on the water levy is in force involving stakeholders not previously represented. To involve stakeholders, the Minister of Rural Resources and Water Development, has established a Pricing Task Force which has up to 21 representatives including the CFU, Town Councils, ZFU and some government departments. The main purpose is to establish principles to be used in the pricing of the water. These principles would therefore be acceptable to a wide range of stakeholders.

6. CONCLUSION AND RECOMMENDATIONS

The issue of rights over resources that communities manage and use remains unresolved. While there are strong arguments for devolution, this does not mean that the government has no role or that the traditional institutions are the panacea to issues of resource management. Rather, the right balance needs to be established between local level systems to use and manage the resources, and state administrative systems to regulate and provide enforcement and technical services. This of necessity implies that traditional institutions themselves need to be strengthened and modernized so that they can be responsive to prevailing socio-economic conditions. In addition the governance systems at the local level need to be supported so that they can bring together a variety of actors involved in land, wildlife, grazing, water, forest and woodland management. Government institutions must of necessity be strengthened to provide an enabling environment for sustainable development.

The experience in Zimbabwe with both the wildlife and the forestry sectors has highlighted the importance of secure and clear property rights to sustainable development. They are important to increasing incomes, to conserving and expanding the resource base and they can be important in addressing equity. The beneficiaries of centralized, property rights systems are seldom the local communities or landholders. Within communal areas the poorly specified property rights to resources benefit the richer smallholder farmers and leave the poorest farmers in communal areas paying the costs without reaping the benefits.

Land tenure is a complex issue that should be allowed to develop or evolve with changing socio-economic and cultural conditions of a given community. In Zimbabwe, the independence government has continued the tradition of the settler government, in continuing to alienate users from the land. Traditional or customary tenure systems offer as much security as any other system provided that communities have legal ownership and authority over their land and natural resources and provided the institutions encourage adaptation to changing social and economic conditions. Governments can strengthen this tenure system by supporting and empowering local communities. Highly centralized systems of governance, combined with bureaucratic top-down decision making systems have imposed decisions on people at the grassroots level. This system of government is weak in terms of effectiveness and impact, accountability and transparency, and it denies people the chance to be self-innovative. Tenure security in terms of exclusive rights of groups and individuals are the basis of political and social power and status. When such rights are overly subordinated to the state, it follows that the political rights of rural people are diminished, and that democratic processes and institutions are undermined. This then is a major cause of tenure insecurity, with resultant negative impact on sustainable development of rural society.

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Appendix Five

Mopane Worm Utilisation and Rural livelihoods in Southern Africa

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1 Introduction

In recent years there has been growing interest in the roles of non timber forest products (NTFPs) in the livelihoods of poor rural people, and in the potential for expanding returns to NTFP activities. Initiatives to expand these returns commonly look for technical and institutional innovations in the management and utilization of forest resources, and in the processing and marketing of forest products. However, it is important that in such initiatives researchers and development workers understand the roles that NTFPs play in rural livelihoods, and then match innovation development to the resources, aspirations and constraints of current livelihood strategies. In this paper, we analyse the roles of mopane worm harvesting in rural livelihoods against a categorisation of different types of rural livelihood strategy. This analysis suggests different types of technical and institutional innovation that will pose opportunities and threats to different classes of household who participate in mopane harvesting.

The paper is structured into six sections. Following this introduction we describe the principal features of rural livelihoods and of mopane worm harvesting in the 'mopane belt' in Zimbabwe and Botswana. Section 3 then introduces the categorization of livelihood activities to allow, in the following section, an analysis of the roles of mopane worm harvesting in rural livelihoods in the region. This analysis then allows us to investigate the potential for different types of technical and institutional innovations in the management and utilization of mopane woodland, and in the processing and marketing of mopane worms.

2 Rural Livelihoods and Mopane Worm Harvesting in Zimbabwe and Botswana

The mopane worm (MW), the edible larvae of the Saturnid moth *Imbrasis beilina* is one of the best – known and most economically important forestry resource products of the mopane woodland in southern Zimbabwe, Botswana and the northern Transvaal (Timberlake, 1996; Bradley and Dewes 1993). Styles (1994) data estimated an annual population of 9,500m mopane worms in South Africa's 20,000 km^2 of mopane veld worth £57m, of which approximately 40% goes to producers who are primarily poor rural women. Originally, the mopane worm used to be an important food source for the rural communities occurring within the range of mopane woodland, but it is now widely eaten across southern Africa where it has become and important trading commodity. MWs have a high protein content and are considered a traditional delicacy. Women and children are usually involved in MW collection but in recent years men and youth have participated in the gathering of this product, attracted by the income earning opportunities from the supply and trading of MWs. Peaks in abundance of this species are between November and January (major) and March –May (minor), though population numbers and location of outbreaks vary from year to

year. Outbreaks of MW although seasonal, are very timely in that they occur during the early months of the rainy season , when most rural households are in need of cash for food and school fees. However, the high inter annual variability in production means that these products are not a very reliable income source.

2.1 Rural Livelihoods in the Mopane belt

The large outbreak populations of mopane worm in southern Africa largely follow that of the host plant (*colophosperum Mopane*), which occurs in a broad band extending from the northern parts of South Africa into Zimbabwe, Botswana and west into Northern Namibia. The majority of these areas lie in regions of low natural resource potential, where cultivation is risky and extensive livestock production is the most suitable form of agriculture. Unreliable climate causes regular failure of staple grains and a high level of vulnerability to food insecurity.[1] Smallholders in these areas have a long history of involvement in a diverse portfolio of farm and non farm activities although the intensity of involvement in these activities varies in response to outside factors such as natural calamities, shifts in economic policy, conflict, health and disease (e.g. HIV) and overall trends (in for instance resource stocks, population density, migrant labour opportunities and prices). [2]

Smallholders in the mopane belt in Botswana also pursue a diverse portfolio of farm and non farm activities but poverty levels are generally much lower than in Zimbabwe due to the better developed public safety nets afforded by the strong Botswana economy.

2.2 Overview of study areas and research methodology

Some studies have looked at the collection, processing and marketing of mopane worms (Hobane, 1994, 1995 Gondo, 2001), but little is known on the contribution of these activities to rural household livelihoods and the variability of involvement in MW activities between different communities or between different socio-economic groups. Much of the work done to date on MWs is vulnerable to the criticism that the results are 'just case studies' that do very little to provide knowledge rather than hearsay about the wider population of users of this forestry resource. This study reviews a cross section of surveys and case studies from a variety of communities across southern Zimbabwe and Botswana to gain an overall picture of both similarities and variability in MW utilisation among communities and different groups of households that harvest this forest resource.

This report reviews findings from research carried out between April –July 2002 in several communities in southern Zimbabwe where households harvest mopane worms.[3]. Formal

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[1] . In Zimbabwe, for instance, the main areas of mopane worm outbreaks are in districts in the south of the country that lie in natural region 1V and V (in the Zimbabwe classification). Since 1990, these districts have been struck by six serious food crises (1991, 1992 1997, 2000, 2002, 2003).

[2] Reliable data on income sources are scant but remittances and non farm sources probably account for 40-50% of rural incomes of rural people in provinces in which the mopane belt is located (ICES, 1995).

[3] Most of the material presented here arises from a collection of studies undertaken as part of a collaborative research effort, for the 'Mopane woodlands and Mopane Worm project' (DFID project Z1042) between University of Zimbabwe, Veld Products Institute, Botswana; Southern Alliance for Indigenous Resource Use (SAFIRE) and Imperial College London. Although separate individuals worked on each study, common themes were explored and household surveys and data analysis were a collaborative effort. The following data sources are acknowledged - Gondo and Frost, 2003; Gwavuya, 2003 Musitini, 2003; Rutumaba, 2003 and Zhou, 2003

questionnaires, with randomly selected households, were used together with key informant interviews, focus groups discussions and observations. Data were collected on the demographic and socio economic characteristics of households, and involvement in mopane worm activities (harvesting, processing, consumption and marketing). Information on mopane harvesting and utilization referred largely to the December 2001 –January 2002 harvesting season since the March/April harvest did not materialise due to intense drought in southern Zimbabwe at the time. Views were also elicited about problems and constraints collectors experienced undertaking MWs activities, the contribution of mopane worms to peoples livelihoods and conflict issues relating to access and use of mopane resources. Formal survey data is also complimented with qualitative data from participatory livelihood analysis (PLA) undertaken in Gwanda, Chiredzi and Mwenezi (SAFIRE, 2002)

Figure 1 shows the location of the five districts in Zimbabwe for which detailed survey results and/or PLA data are available. All of these areas lie in marginal rainfall regions characterised as too dry for successful crop production without irrigation. Smallholder farmers grow crops in these areas despite the low rainfall. Sorghum and millets are common crops but many farmers grow maize, which is the preferred staple. Some households in study communities in Masvingo and Midlands grow cash crops, such as cotton, but overall cash cropping is not a major feature of dry land farming in rural communities located in the mopane belt. As in most rural communities, access to social and commercial services is constrained by the highly dispersed nature of settlements , the poor state of roads and the high cost of transport. Generally, study communities in Masvingo province face better market access due to their proximity to the Masvingo – Beitbridge trunk road linking Zimbabwe with South Africa. The communities in other areas faced greater difficulties and problems are most severe in the remote Kapeni village.

In Botswana, key informant interviews and community workshops were held with mopane harvesters in the villages of Lerala and Maunatlala of East Central Botswana during the 2001/2002 MW season. In addition, field surveys were conducted at four MW outbreak sites (Lechana, Tshokana River, Matopi village and Kutamgore) and over 107 people, including children were interviewed during December 2002. Information on harvesting activities was collected through interviews with individual harvesters and focus group discussions at campsites and while groups were harvesting. The project's MW cleaning drum was used to clean and, more importantly remove the spines of the group's ready dried MWs. Involving people in discussions and interviews while they were actively engaged in harvesting and processing, proved a good way of engaging peoples interest in project activities and information flowed freely (Taylor, 2003).

The demographic and socio economic characteristics of households surveyed in the study areas are given in Table 2. Average household size is around seven, with some variation between study areas. Women head or manage more than 50% of households, except in Ndiweni. Children under 18 years account for 52-63% of survey population, emphasising the significance of children in the domestic group. Land holdings varied both within and between study areas. Average land holding was above 5 acres (2.25 hectares) but cultivated area in 2001/2002 was generally only 70-75% of holding. Prevailing drought conditions and inadequate resources (particularly loss of draft power due to recurrent drought in the 90s) account for this. 26-39% of respondents had no cattle, which is

in line with prevailing situation in other communal areas. [4] Donkey ownership is widespread and these animals supplement draft power. Almost all study households in Masvingo and Matableland South own goats, illustrating the importance of smallstock in drier rainfall areas. A plough is the most frequently owned asset and the proportion of respondents owning ploughs is generally higher than proportion whom own cattle, supporting the assertion that cattle ownership has fallen due to successive droughts. The widespread ownership of solar panels and radios among study communities in Masvingo and Matableland South underlines the prevalence of wage employment across the border. It has become the habit for youths to bring home at least a solar panel and a radio after a long period of work outside the country (Musitini, 2003).

2.3 Synthesis of findings

2.3.1 Who harvests MWs?

Key questions in the analysis of NTFPs relate to the typology of households that participate in collection, processing, consumption and marketing of NTFPs. Within the household it is of interest to understand the pattern of gender roles for different activities related to NTFPs. Within communities it is of interest to establish whether poorer households are more likely to participate in NTFP activities than wealthier households and whether households that receive larger sums of employment income are more or less likely to participate (Mutamba, Chirara and Frost, 2002).

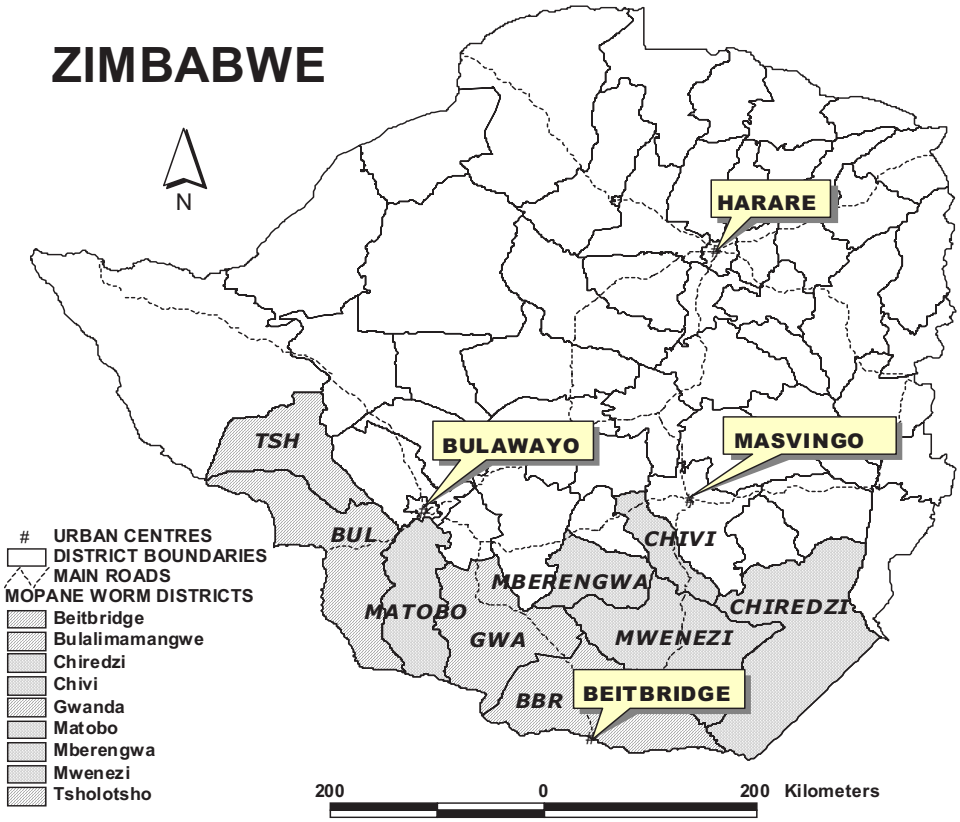
In all the Zimbabwean study areas, there was widespread involvement in Mopane worm collection by all categories of households. In most communities, more than 80 % percent of households interviewed collected MWs during the 2001/2002 season. (Table 2). Some households not involved in collecting mopane worms belong to religious groups that forbid collecting of such products[5]. Widespread collection of MWs suggests that utilisation of this forestry resource is not limited to the poorest households but is an activity undertaken by all social classes. Limited income earning opportunities and low income levels throughout these communities encourage almost all households to take advantage of a 'free forest resource', particularly one that is available at a time of year when stored supplies of staples are finished and the new crop is only just planted. [6]. In PLAs in Gwanda, Chiredzi and Mwenezi, communities indicated that the poor form the largest groups of mopane worms harvesters and rich families hardly harvest MWs at all, since they are too busy making money from other means such as own shops and grinding mills (Safire, 2002). It was noted however, that such households often buy MWs from local collectors as part of their business. Better off households, who do not necessarily participate in MW collection, thus still participate in MW related activities.

[4] Fewer households from one study area (Chilonga) were without cattle but this lower percentage may be due to selection bias that purposefully included some households who bought MWs from other collectors

[5] For example, four households from Ndiweni not collecting belong to the Seventh Day Adventist Church. (Gondo and Frost, 2002). However, in one study area (Bangwe), people belonging to the Zionist church, which forbids the consumption of MWs, still participate in collection for the sole purpose of selling (Zhou, 2003).

[6] A national income and expenditure survey estimated that 80% of the rural population in natural regions IV and V were poor and over 55% very poor (ICES, 1995).

Figure 1: Map of Zimbabwe study areas



The level of involvement of different categories of people in harvesting, processing and marketing by gender and age is shown for four study areas in Tables 3-5. Some interesting facts emerge. Collection and processing of MWs are traditionally regarded as women's tasks. [7] Although women and children still predominate, participation by men and particularly youth is extensive. For instance, in Mwenezi, more than 90% of male respondents between the ages of 12-17yrs and about 30% male adults were involved in collecting MWs. (Table 3). In Chilonga 59 % of adult males aged 18-33yrs collected MWs in the 2001/2002 season and about two thirds of the youth. Not all males collecting MWs participated in the processing (Tables 3 and 4). Evidently this task is still regarded as women's' work by some men! In both Kapeni and Ndiweni nearly three quarters of men were engaged in mopane worm activities (Table 5).
In the harsh economic climate of Zimbabwe, rural families are coming under increasing economic strain. Recurrent drought, widespread unemployment and rapid inflation have undermined households' ability to meet basic needs. Income form selling mopane worms is seen by an increasing number of men and youth in addition to women as an available way of alleviating financial problems. Often youth collect and sell MWs to raise essential cash for school fees and stationary. The high level of involvement of children in mopane worm collection illustrates the pervasive role of children in the labour force. In rural areas it is common for children to 'help' their parents with routine chores and 'productive' activities form an early age (Mangoma and Bourdillon, 2001). The December MW harvest occurs at a time favourable to parents for receiving help from their children because the harvest coincides with the school holidays. The same is often true for the April harvest. The involvement of young children in MW collection, in contrast to youth, is seldom an individual strategy, rather it occurs within the framework of the household.

In the Botswana field survey 96% of harvesters were women. 74% percent of people involved were adults between the ages of twenty one and sixty, 8% were over 61 years, and fourteen percent were young people between the ages eleven and twenty. About 10 percent of the people involved were children less than 10 years who were brought primarily to assist with campsite based activities while mothers were out collecting mopane worms. These activities included looking after babies and raking over the MWs that were spread out to dry, as well as guarding them against hungry cows and the possibility of rain. (Taylor, 2003). That MW collection in Botswana has remained the preserve of women is probably because Botswana men, in contrast to their Zimbabwean counterparts have more attractive income earning opportunities due to the strength of the economy.

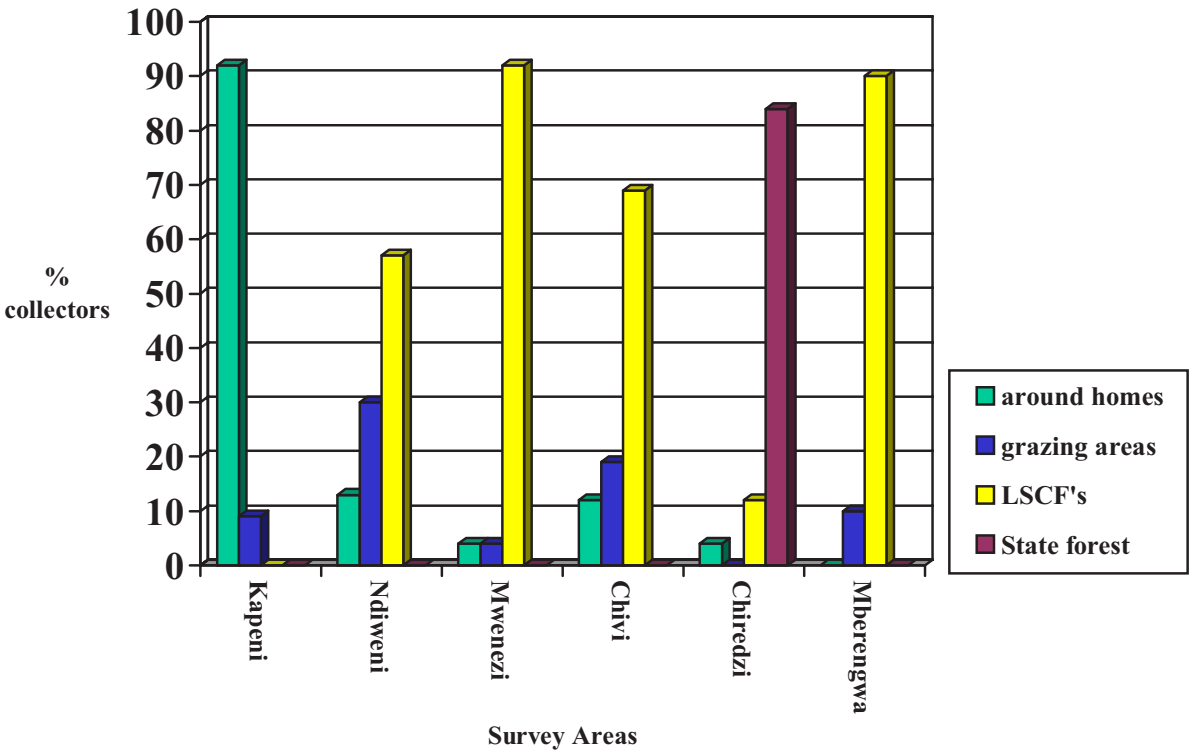
Zimbabwean data disaggregated by wealth group and status of household head show that in some areas (Kapeni, Ndiweni, Chivi, and Mberengwa) the extent of involvement in MW collection, measured by quantity collected, was higher for poorer than better off households (see Tables 6 and 7) and also tended to be lower for female managed households, (presumably because they have relatively secure incomes from husbands working elsewhere) than either male headed or female managed households (Table 8). But, these differences were not significant and no firm conclusions could be drawn on the typology of households that participate in collection.

[7] Hobane (1995) established that collectors of mopane worms are mostly women and children. Results from her survey revealed that 91% of the collectors are women.

2.3.2 Where are mopane worms harvested?

Mopane worms are collected from mopane woodlands under a variety of land tenure and access arrangements. In Zimbabwe, mopane trees are located around homesteads (individual and open access), in communal grazing areas (open or managed access), on large-scale commercial farms (private managed access) and on state farms (public managed access). It is generally assumed that in Zimbabwe the bulk of MWS are harvested from communal woodlands but survey data casts serious doubts on this assertion indicating instead that mopane woodland on formerly large scale commercial farms is a very important source of the product (Figure 2.) In Botswana, much of the mopane belt is located in tribal areas where customary law allows anyone to harvest.

Figure 2: Main sources of Mopane Worms by Survey Area, Zimbabwe.



Information was gathered from households on where they collected mopane worms. Although some households collected from more than one source each study community generally had a dominant source from which the bulk of production was harvested (Table 9). In both villages in Matobo, mopane worms are abundant locally during outbreaks. Nevertheless in the 2001/2002 season, more than half the residents of Ndiweni village, to satisfy their requirements, harvested on adjacent commercial farms and state land, where mopane tree cover is more extensive. Only 13% harvested around their homesteads, while 30% collected mopane worms from the communal grazing area. In contrast, residents of Kapeni village harvested mopane worms solely from around their homesteads (92%) or in the communal grazing area (8%) (Gondo and Frost, 2003). Thriving mopane woodlands on commercial farms in Mwenezi and Chivi and Mberengwa districts favour

widespread outbreaks that attract villagers from surrounding communal areas and outsiders. [8] A high proportion of villagers in these districts identify commercial farms as their main source of MWs although MWs were also collected from around homesteads and the communal grazing area (Table 9). In contrast, people in Chilonga relied on mopane worms from state forest woodland (Epungeni Forest) for nearly three quarters of the total harvest (Table 10). In this community commercial farms accounted for less than 15% of MWs collected.

The need for some communities to collect MWs on land controlled either by private landowners or the State, adds considerably to the cost of harvesting mopane worms (Gondo and Frost, 2002). People sometimes travel considerable distances to these sites and often camp for several days in the collection area while harvesting. Collectors are also often required to pay a harvesting fee to the owner of the land.

Since the MW outbreaks coincide with busy periods in the agricultural season, households face conflicts between MW collection and agricultural activities and have to make choices in allocating labour.[9] The problem is most severe for households travelling to collection sites outside the community. In recent seasons priority has been given by many households to mopane worm collection. Where feasible a few family members remain at home to take care of planting and weeding whilst others collect MWs. In extreme cases however, planting is delayed (Gwavuya, 2003,). A common strategy, when collection areas can be visited within a single day is to collect on traditional non working days. In Mwenezi district these are Thursdays and Sundays. (Gwavuya, 2003). In addition where MWs are abundant locally harvesting around homesteads and from the grazing area takes place in the afternoon once agricultural tasks are complete.

In Botswana, collectors of mopane worms include people living in villages and cattle posts near outbreaks and outsiders who travel to outbreak sites. Distances traveled vary greatly. The longest distance traveled to the out break site was 120kms. The shortest was within a hundred metres of one harvester's back yard (Taylor, 2003).

The variety of sources of MWs and variability in their importance between communities adds to the complexity of the issues that need to be addressed when considering innovation development. Resource management options and livelihood constraints.

2.3.3 How are MW harvested and processed?

Mopane worms are collected from both the ground and from trees, usually the 5th instar stage, and the last stage before pupation. Mopane worms collected from the ground, immediately prior to pupating generally have little digested food in their guts and are easier to process. However, most MWs are collected from the trees while still feeding and so have to be processed thoroughly to remove all undigested material from their gut (Gondo and Frost, 2002). People usually check for waste products below trees to identify the caterpillar's presence. Harvesting and processing of MWs throughout the mopane belt is still pretty much traditional but widespread destruction of trees in order to speed up the collection process is increasingly identified as a problem (SAFIRE,

[8] For example, in Chivi District, outside collectors (relatives of locals and unknown people) come from towns such as Beitbridge, Masvingo and Chirdezi and other rural areas (Ngundu, Nyilkavanhu and Rutengwa (Musitini, 2002).
[9] In some seasons, due to the sporadic nature of outbreaks, the MW harvest does not begin until after planting which lessens activity clashes. But, generally labour is a constraint and households have to make choices about prioritising activities

2002). No improved technological devices were identified during fieldwork beside the use of gloves to protect hands from the sharp spines during collection and degutting. The MW is removed from the tree by holding it at one end (either by the head or by the rear end) and pulling it to peel it off the branch. This way the suction force exerted by the suction pads on its legs is easily broken (Taylor, 2003).

The bulk of MWs are disemboweled by squeezing them by hand to expel the guts while walking around harvesting. Fifty percent of the harvesters in the Botswana survey used gloves during harvesting whilst a further 20% of the collectors wrapped their fingers (especially thumbs) with pieces of cloth (Taylor, 2003). In Zimbabwe, few collectors use gloves since these are expensive locally relative to people's income. People try to avoid the discomfort of sharp spines by using home made protection (strips of plastic or cloth) or using bottles as rollers or crushing the MWs with sticks (Table 11). The latter methods are common among those who collect in bulk some of whom are also reported to degut by starving MWs for about 2-3 days in a large sack (Musitini, 2002). A recent practice adopted by some collectors is to place MWs in a pit, cover with hot coals and allow the build up of heat to expel the gut contents. (Gwavuya, 2002)

After degutting MWs are preferably rinsed with water before cooking. Where there is a shortage of water MWs are cooked without washing. Among Botswana harvesters about 10 % of MWs were cooked without washing (Taylor, 2003). In the Zimbabwean studies the proportion of unwashed MWs was slightly higher (Table 11). People have various ways of cooking MWs but the most common are either boiling in salt water and then sun drying or roasting over a bed of hot coals then sun drying. The latter method is faster, uses less firewood and saves labour which is an advantage in the rainy season when a common problem is delays in drying due to wet and overcast days and shortage of firewood. Collectors participating at a community workshop in Masvingo indicated that MWs that are boiled and sun dried are preferred , particularly by women for storing for home use (SAFIRE, 2002). At the same workshop, people involved in roasting complained of the danger of burns from tending MWs over hot coals.

Processing is often done in the collection areas, especially in Botswana where collectors travel to outbreak sites and among Zimbabwean villagers who camp in collection areas. If people live close to the collection areas MWs are normally carried home for processing. The widespread practice of processing in collection areas has implications for the nature of technical innovations that are likely to be adopted by collectors. Equipment that is bulky and heavy to transport is less attractive than lightweight innovations.[10]

2.3.4 How much is harvested?

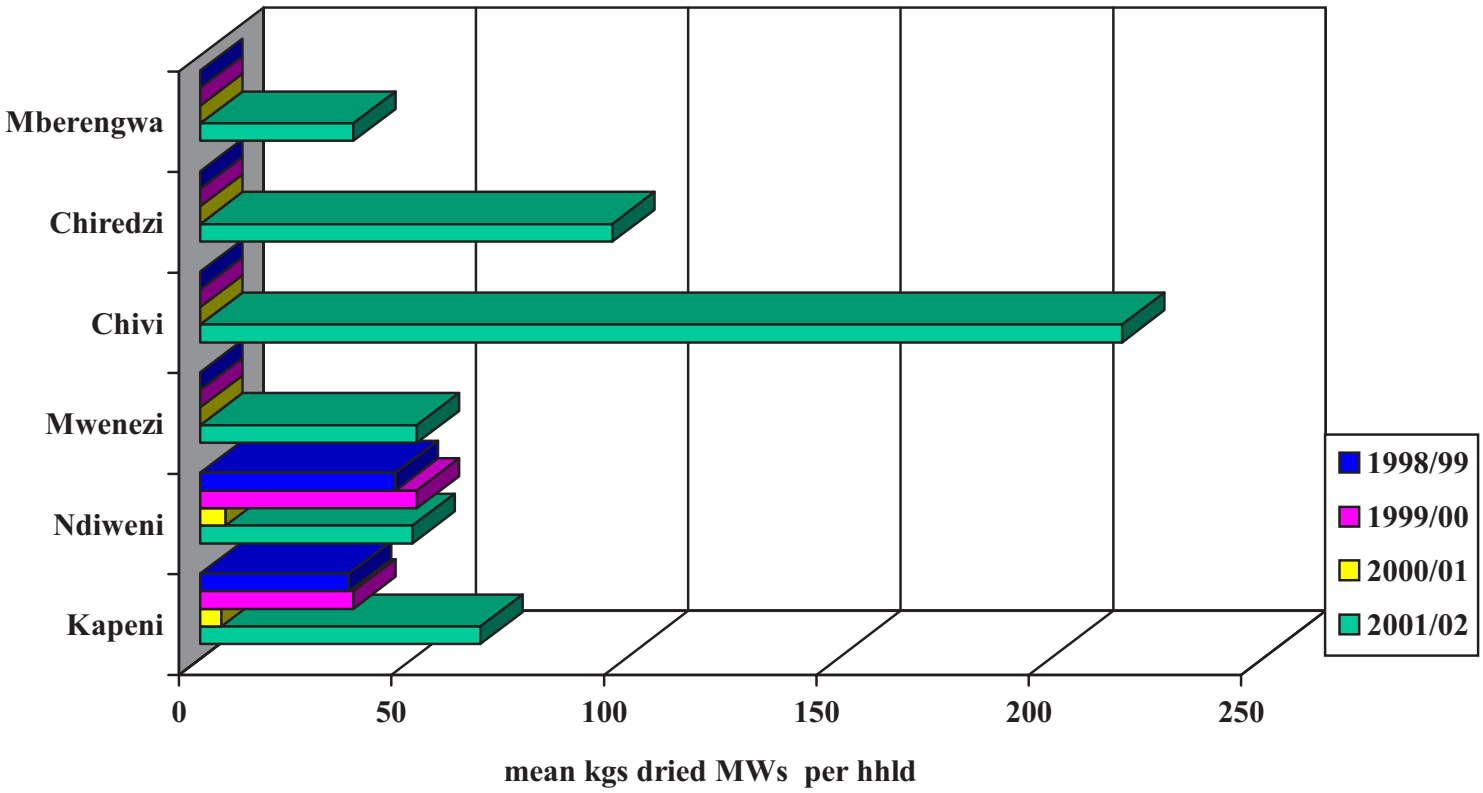
Variability in the extent of harvests both within and between communities and from year to year is clearly demonstrated from available survey data (Figure 3 and Tables 12 -13). Among six Zimbabwean communities average MW production ranged from 36kg– 217kgs per household in the 2001/2002 season.[11] The community with the highest average (Gwerima , Chivi District) is well known locally for good MW outbreaks on adjacent commercial farms. In addition, there is considerable variation in output between households as demonstrated by high standard deviations

[10] Field trials and community workshops in Botswana confirm this finding as producers showed a greater interest in lightweight drying racks than bulky cooking equipment (Taylor, 2002).

[11] 20Litre buckets are the most common local measures for MWs. Data has been converted into kgs based on an estimate of 6kgs per 20 litre buckets.

about the mean (Table 13). An additional source of unpredictability is the episodic and unreliable nature of MW outbreaks which leads to variations in both the location of outbreak sites and extent of MWs from season to season. This is well exemplified with harvest data for four seasons from two villages in Matobo (Table 13).

Figure 3: Quantity of Mopane Worms Harvested by Survey Area



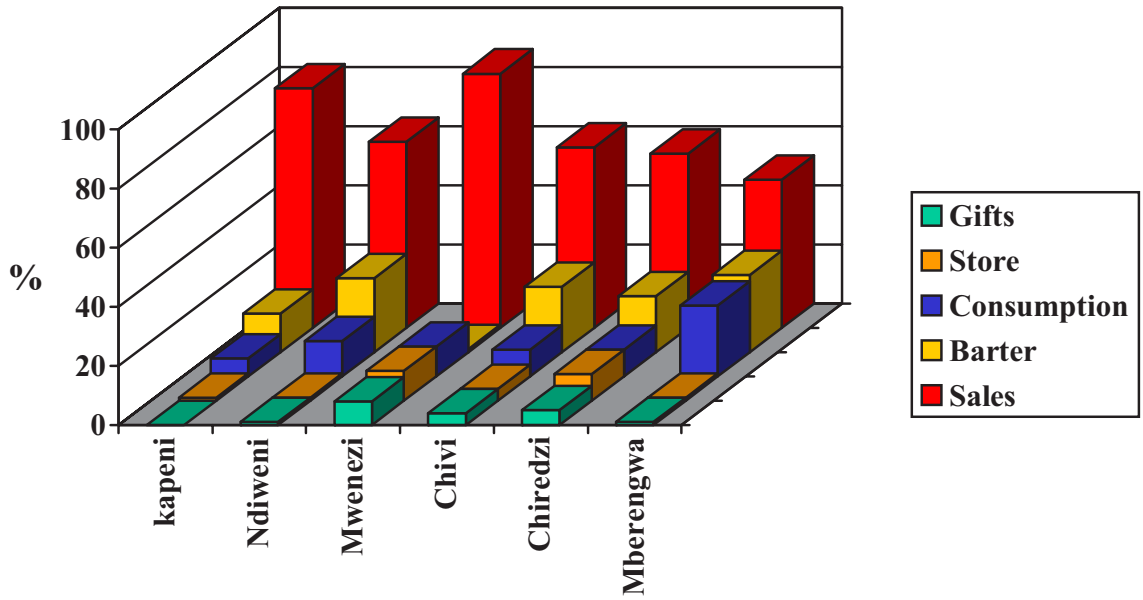
Harvesters in Botswana, in a good season, reported harvesting between two – four 20L containers a day of degutted worms per person and ended up with up to seven 25kg bags (350kgs) of dried worms at the end of the harvesting season. In a bad harvest such as the current one (2002/2003), an individual may fill only one bucket a day and end up with two or at the most, three bags (75kgs) at the end of the harvesting period (Taylor, 2003). The extent of MW harvesting by individual households in Botswana is considerably above that of most households in Zimbabwean study communities. Whatever the explanation (likely relative abundance of MWs and/ or less competition for collection in Botswana) these differences in operating scale present challenges when considering potential innovations to enhance the livelihood contribution of this forest resource. Further, variations in level of harvesting indicate that the contribution of Mopane Worms to rural livelihoods is likely to vary both between communities and from year to year.

2.3.5 Why are mopane worms harvested?

Whereas harvesting of mopane worms was traditionally a subsistence livelihood activity, undertaken largely for nutritional purposes, increasing commercialisation of the resource has been taking place throughout the mopane belt in recent years (Hobane, 1994, 1995; Rebe, 1999 quoted

in Kozaniya and Frost, 2002). Trading (cash sales and barter exchange) accounted for a large proportion (between 76- 94%) of MWs collected in communities studied in Zimbabwe (Figure 4 and Table 14). The distribution of MW output in Chilonga, Chiredzi district typifies the pattern of utilization. Following the 2001/2002 harvests, 59% of MW stocks were sold for cash and a further 19% were exchanged for goods, 9% were consumed at home , 5% were given as gifts and at the time of the survey (July 2002), 10% were held in store for own use or sale. (Rutamba, 2003). These results contrast with those obtained by Hobane in the early 90s who found that over three successive years (1990-1992), only 30-38 % of stocks were sold, 24-36% exchanged, 28-39% consumed and 2-10% given to others (Hobane, 1994, quoted in Gondo and Frost, 2002).

Figure 4: Utilisation of Mopane Worms, by Survey Area



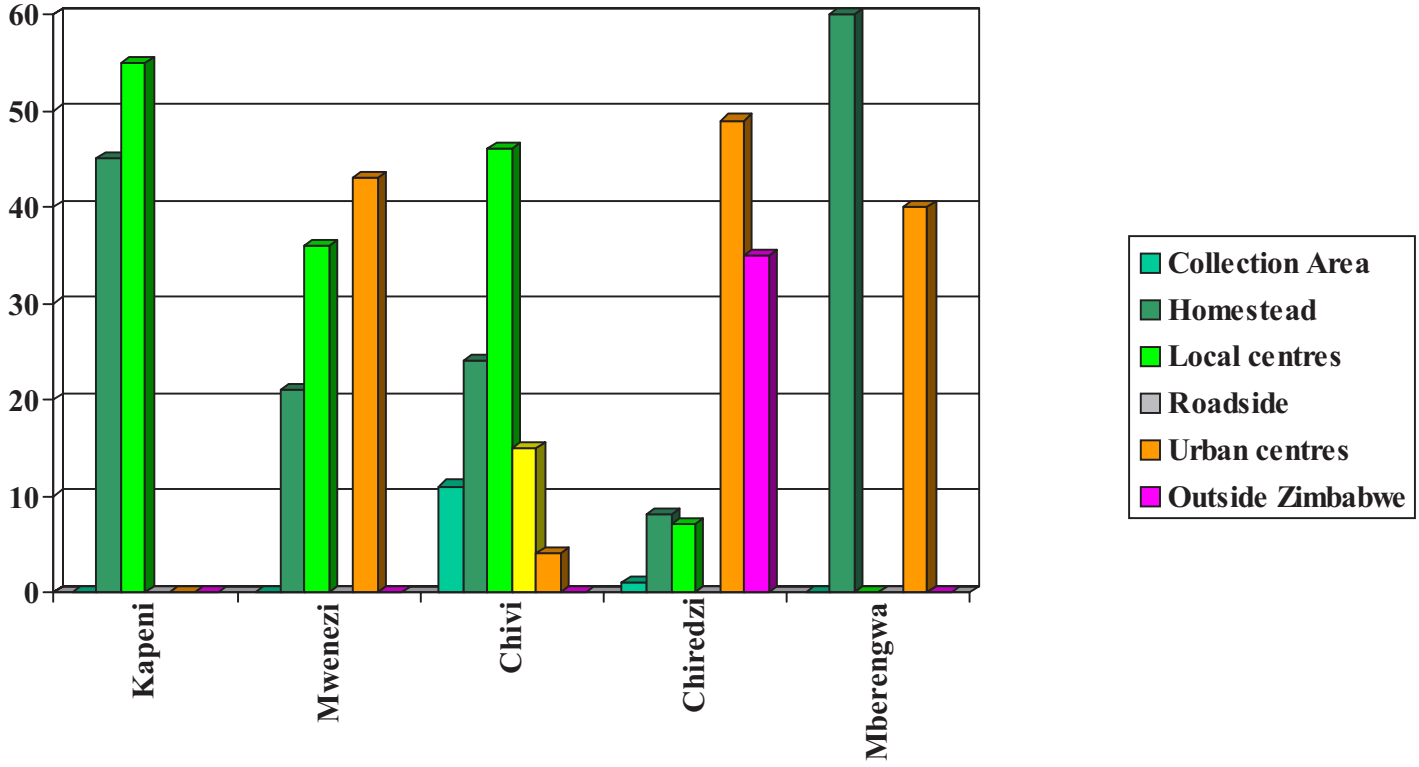
Increased commercialisation of mopane worms in Zimbabwe may be a consequence of the economic hardship that followed economic structural adjustment and the contraction of economic growth, especially in the rural areas, compounded by the severe droughts of the late 1980s and early 1990s. These events adversely affected the poorer families, particularly in areas of low agricultural potential, leading those with limited resources to seek other sources of income, such as from the harvesting, processing and sale of NTFPs (Cavendish, 1999, quoted in Mutamba, Chirara and Frost, 2002). Further, in urban areas, poverty levels have increased in recent years. This has resulted in a strong demand for relatively low cost protein as relish ingredients to accompany the traditional staple (Stack and Poole, 2003).[12] Surveys of formal and informal retail outlets selling MWs indicate strong urban demand for MWs and that the business is profitable: the main problem in the market is within and between season variations in supply.

[12] MWs together with beans and kapenta (small dried fish) are favoured cheaper alternatives to meat for low income urban consumers. In, Mbare Musika (open air urban market in a high density area in Harare) these three foods are often displayed side by side on the same stall , where they can be purchased by the cup (< 100grams) for a similar price. (In January 2003, the prevailing price was Z$300 per cup).

2.3.6 How do rural collectors market MWs?

Dried MWs from the rural areas increasingly find their way into both the formal and informal national distribution network via a wide variety of marketing chains (Kotsanyi and Frost, 2002 and Stack, 2002). Mopane worms reach urban markets via a number of pathways (Collectors, rural traders urban based middlemen) and are marketed in a wide variety of places including urban bus termini, open markets, roadside vendors, wholesalers, supermarkets, and tuck shops. In some instances the marketing chain is quite long. Generally, rural collectors play a limited role in upstream marketing activities and wait for traders and middlemen to purchase the dried mopane worms and move the product from the collection areas to the point of sale (predominantly urban areas but also cross border markets). As MWs move up the marketing chain the product changes little in form, except that some vendors and wholesalers pack loose MWs in plastic bags for resale. Most intermediaries simply move the product around in space and time.

Figure 5:Quantity of Mopane Worms Sold by Producers in Different Markets by Survey Area



Sales from home or at local centres account for the bulk of MW trading by rural producers. Only a small proportion of collectors market the product outside of their local community. (Figure 5 and Table 15). For example in Mwenezi, in the 2001/2002 season, 24 % of cash sales took place at the homestead, 59% at a local centre and only 17% at an urban location. The participation of collectors in up stream marketing activities appears to vary with market access. In Kapeni, which is located in a remote area of southern Zimbabwe, all sales were local and no collector in the survey had marketed MWs outside the community. In contrast, in Chiredzi which is accessible to

the main trunk road to the border town of Beitbridge, 55% of cash sales of MWs were transacted in an urban centre and 19% across the border. Clearly market access determines how close collectors get to the final point of sale. In turn, this often effects net returns. Price data indicate that the average net price (after allowing for marketing costs) varies by location of sale and is significantly higher for sales across the border and generally (but not always) higher in urban centres than local centres. [13] For instance, in the 2002 season Chiredzi collectors selling MWs realised on average Z$97per kg at the collection area, Z$132 per kg MWs for sales at a local centre, Z$ 205 per kg for urban market sales and Z$409 per kg for MWs sold across the border in South Africa (Rutamba, 2002).

Households who bartered MWs for other goods (such as maize grain, clothing, kitchen utensils) generally undertook these transactions within the local community with the bulk of barter deals occurring at the homestead. For example, in Chiredzi, 65% of barter transactions took place at the homestead, 24% at local centres and 10% in the Mopane woodland. (Musitini, 2002). Bartering is not a common form of exchange in urban centres.

Most collectors dispose of MWs destined for the market as soon as possible after harvest. Few collectors store MWs for sale out of season despite the considerable financial attraction of doing so. A study of off-season marketing of MWs indicates prices for MWs rise considerably later in the year and that collectors could enhance their returns from MWs by retaining some in storage for marketing off-season.[14] Currently the storage function is undertaken much further up the marketing chain, primarily by wholesalers and traders at the final point of sale (Rutamba and Stack, forthcoming).

For MW producers to capture a greater share of the market value of the worms they need to be more involved in adding value by, for instance, moving MWs closer to the point of sale or by storing MWs in anticipation of profitable off season prices.

2.3.7 How important are MW to rural livelihoods?

Mopane worms are harvested for both home consumption and sale (including barter). When asked to rank their motives for collecting MWs the vast majority of Zimbabwean households identify the opportunity to earn cash income as their prime motive and food uses as secondary (Table 16). However, it is the timing of this income earning opportunity, during the early months of the rainy season which is traditionally the hungry period, which is a key factor in understanding the role MWs play in rural livelihoods. Survey data confirm that MWs are seldom the most important source of household income, particularly among livestock owning households, but that the prime motivation for MW collection is the opportunity they provide to earn cash or obtain exchange good to fill seasonal cash flow gaps, especially for those households with limited remittance income (SAFIRE, 2002). This is supported by survey information on how households use income from

[13] For instance, it has been noted that collectors who travel by bus and sell their MWs on arrival at an urban bus termini often realize no more and sometimes less than if they had sold MWs locally. So it is not always the case that urban markets are more lucrative than local ones. Some collectors come to town to sell MWs because there is no trader in their community at the time they want to sell. Having expended a bus fare they do not want to return home without selling their produce and therefore accept whatever price, the buyers at the bus termini are offering.

[14] Poor rural dwellers reasons for not storing MWs are often very rational, such as a pressing cash need to cope with seasonal food shortages and to pay for things like school fees.

MW sales and the importance of MW income in funding those purchases. Table 17 shows the percentage of households using MW income for different purposes and the percentage of households who identified MW income as the main (1st) source of income for such expenses. MW income was the main source of funds primarily for purchasing grain, other foodstuffs, paying school fees and obtaining (buying or bartering) kitchen utensils. Although a large number of households indicated that some MW income was spent on agricultural inputs, medical expenses, travel, buying clothes or invested in livestock, MW income is rarely the most important source of funding for these expenditures. The type of goods that MW income is spent on also reflects the high level of participation of women and youths in MW collection. [15] For the women, MWs provide an opportunity to earn money for family provisioning and for children and youths; participation in MW activities (either as an individualised economic activity or as part of the family group) provides an opportunity to earn cash to meet schooling and stationary needs.

The contribution of mopane sales to household livelihoods is difficult to assess without comprehensive data on the contribution (in cash or kind) of all livelihood activities. However, an indication of their contribution can be assessed by estimating the cash income derived from the sale of such products relative to other income sources. The widely observed phenomenon that income from forestry products tends to be of greater importance to poorer socio economic groups is confirmed by survey data. In Mwenezi District for instance, mopane sales accounted for nearly forty percent of reported cash income for the bottom 25% of households, twenty percent of income for the middle 50% of households and less than 4% of cash income received by the top quartile.[16]

Harvesters in the Botswana study identified collection of MWs to be a vital source of income despite outcry over low buying prices. Nevertheless, all harvesters are involved in other forms of livelihood including cropping, rearing livestock, selling traditional beer and working for the Drought Relief programme Harvesters in Botswana also use the proceeds of MW sales for various household supplies including food, school uniforms and fees, buying household utensils, reinvestment in livestock, vending and property paying medical expenses (Taylor, 2003).

2.3.8 What are the differences in involvement in MW activities among various types of households within communities and between different study areas?

In absolute and value terms, poorer socio-economic groups in some communities (Kapeni, Ndiweni, Mwenezi) harvested more MWs than better off households in 2001/2002. However there is evidence that some of the value of the higher harvest is lost through lower prices achieved by MW sellers from poorer households compared to those from better off households. (Stack et al forthcoming). The factors accounting for this include, among others, the greater likelihood that poorer households engage in barter transactions, the lower involvement of poorer households in MW markets outside the community and therefore higher dependency on market intermediaries, and the pressing cash needs of poorer households which provide little scope for storing MWs to take advantage of anticipated upward seasonal price movements.

[15] In a ranking of livelihood activities, people in Gwanda, Chirdedzi and Mwenezi identified livestock sales as the most important livelihood sources. However they also mentioned that crops are key to subsistence in the area but there is hardly any surplus to sell. Particularly women rank Sale of MWs above crafts and small scale businesses as a source of cash. (SAFIRE, 2002).

[16] Households were placed into wealth categories using information on livestock ownership (cattle and smallstock) which are recognized by local communities an indicator of wealth status.

Although most MW abundant areas are found in environments of low agro ecological, potential significant variation in mopane worm production and market systems and environments is apparent, both between and within countries.

- *Botswana* has a growing economy and (in some areas at least) declining interest in mopane worm collection as other more lucrative income generating opportunities and jobs become more widely available. The devaluation of the Rand against the Pula has depressed export prices, while there is only a small domestic market.
- *Zimbabwe* has a contracting economy and growing interest in mopane worm collection as other more lucrative income generating opportunities and jobs become more difficult. The devaluation of the Zimbabwe dollar against the Rand (in the parallel market) at least maintains export prices, but there is in any case a large domestic market that is probably growing as mopane worm presents a cheap protein source for urban dwellers.

Differences within countries – between areas/ communities and within areas/ communities:

- In *Botswana*, poorer people in less accessible villages are more dependent on mopane worm as a cash source (and are likely to remain more dependent for longer) as compared with those in villages that are more accessible.
- In *Zimbabwe,* there are large differences in access to other sources of cash, in access to markets, in pressure on mopane woodland and on mopane worm outbreaks, and in the nature of access to mopane resources (communal lands, commercial farms, state farms, with differing systems and costs for gaining access

Variation between households and communities (as described above) has important implications for the range of technical, institutional and market innovations that are appropriate to different MW users

3 A categorization of livelihood strategies

Rural livelihoods may be considered as dynamic strategies by which rural people seek first to survive and then to improve their well being over time. Dorward and Anderson (2002) have suggested that livelihood activities may play different roles in these strategies, and categorise these roles in terms of 'hanging on', 'stepping up' and 'stepping out'. 'Hanging on' describes activities that enable households to maintain their current livelihood (to survive) while the latter two roles represent different pathways for livelihood improvement, the first involving accumulation of productive resources to expand current activities and income, the second the accumulation of resources that can be used as a base from which to shift to different, more desirable livelihood strategies.

Dorward and Anderson develop their conceptual framework in examining the role of livestock in the livelihoods of poor livestock keepers. They argue that for the poorer livestock keepers livestock are likely to be important in helping them to 'hang on', providing important buffering and insurance roles as they struggle to maintain precarious and vulnerable livelihoods at the margins of survival. In some situations they will also play important productive roles, providing for subsistence (through home consumption of meat, milk, eggs or fibre) and/or supporting complementary (commonly cropping) activities (providing draft power or manure). Beyond the minimal maintenance roles, livestock keeping may enable advancement through accumulation either of more productive animals (the 'stepping up' strategy) or of a set of assets that can be used as a base to 'buy in' to assets needed to gain entry to other livelihood activities (the 'stepping out'

strategy). Within a livestock based 'stepping up' strategy, accumulation of productive animals is critical, whereas in a 'stepping out' strategy the productivity of the animals is less important than their ability to hold value as savings. For 'stepping out' livestock may be accumulated to fund investments in alternative means of increasing income, for example, education (human capital), social and political contacts and advancement (social and political capital), physical capital (such as shops, vehicles and other items used for different businesses), or migration.

In each case livestock based strategies have to be evaluated against alternative means of 'hanging on', 'Stepping up' and 'stepping out'. For hanging on, unskilled labour markets and crop production may be the principle alternative means of subsistence, and social relations, formal safety nets, informal financial markets and micro finance the principle alternative means of buffering and insurance. Most households will seek to spread risk and take advantage of niche opportunities by diversifying across these. For both 'Stepping up' and 'stepping out', alternative means of accumulation may again be investment in social relations, informal financial markets and micro finance institutions. For 'stepping out' there may be any number of alternative means of increasing income, ranging from cropping activities to a variety of non-farm activities.

The 'stepping up' and 'stepping out' strategy of accumulation can be viewed as alternative livelihood paths. The former has parallels with the notion of poverty reduction through increasing agricultural productivity whilst the latter is more closely aligned with the concept of poverty reduction through decreasing dependence of rural households on agriculture through providing non-farm income earning opportunities. Since it is widely acknowledge that rural households, especially in low rainfall areas, depend on a multiplicity of farm and non-farm income sources to sustain livelihoods the two poverty reduction strategies need not be seen as alternatives. However, households or individuals within households are likely to favour one of these alternatives as they become better off even if they continue to keep a foot in both farm and non farm income activities. This pattern is compatible with observations that poorer households often have more difficulty in engaging in higher return non-farm activities[17]

We now apply this type of analysis to examine current and potential roles of MW (and environmental resources in general) in enabling vulnerable households in precarious environments to hang on and/or to promote or support advancement out of poverty. We also need to ask how MW or natural resource based strategies compare against alternative means (farm and non farm) of 'hanging on ', 'stepping up' and 'stepping out'.

4 Current and potential roles of mopane worm harvesting in rural livelihoods in the region.

We begin by adding a fourth role for livelihood activities, to acknowledge the role natural resource based strategies may play in maintaining and improving standards of living (more than just 'hanging on') without resource accumulation or productivity investments (as is assumed in

[17] Reardon *et al.*, 2000 summarising evidence from a number of studies in Africa suggest 'a rough pattern' (with exceptions) of 'a positive relationship between non-farm income share (and level) and total household income and/or landholding in much of Africa' (p272). Barrett *et al.*, 2000 and Toulmin *et al.*, 2000 note a common (but not universal) 'U shaped' relationship between the proportion of income earned and total income, with poorer and better off households with a higher proportion of off-farm income, but with very different returns to these activities, while intermediate households often have lower proportions of earning from off farm activities, as they are able to gain more from farm activities than the poorest households, but are not able to engage in the highest return off farm activities open to the better off households.

the 'stepping up' livelihood path) and without use of income to fund investments in alternative activities (as is implied in the 'stepping out' strategy). We have termed this fourth livelihood strategy 'linking in'. Table 18 and Figure 6 illustrate the relationships between these different activity roles:

Table 18. Principal Activity Roles of Income component by livelihood strategy

Livelihood strategy	Principle MW roles
'Hanging on'	Subsistence Buffering (market income for subsistence needs)
'Linking in'	Subsistence Market production/ income for small cash purchases Income to initiate some lower order 'stepping up' activities Income to initiate some lower order 'stepping out' activities Accumulation of primarily social capital
'Stepping up'	Accumulation of all types of capital assets Complementary production Market production / income
'Stepping out'	Accumulation of capital assets

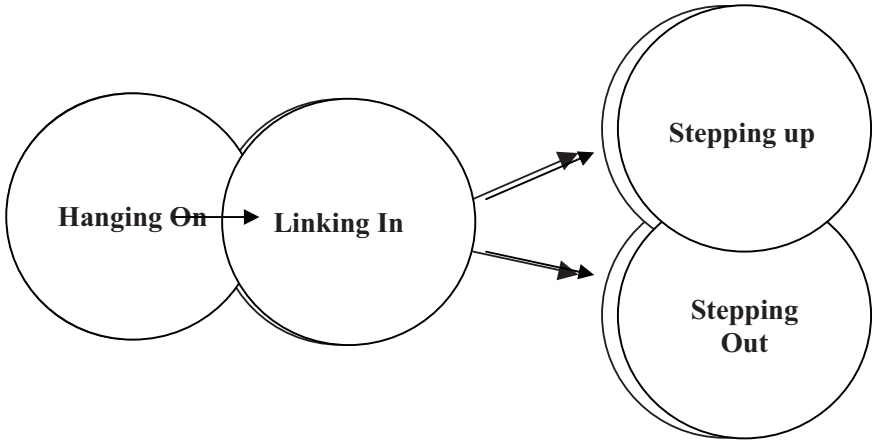


Figure 2: Livelihood pathways

Studies that have looked at NTFPs in the context of rural livelihoods have noted that NTFPs are generally most extensively used to supplement household incomes during particular seasons in the year and help meet dietary shortfalls. . In particular, these resources are widely important as a substitute and economic buffer (or safety nets) in hard times (Luckert, 2001; Campbell et al, 2001, Arnold and Townson, 1998; Hobane, 1995; Mukwekwerere, 1996, quoted in Mutamba and Frost, 2002). The importance of forest income usually lies more in its timing than in its magnitude and although it seldom accounts for a large share of a household's total income, but is often important in filling seasonal or other cash flow gaps, and in helping households to cope with particular expenses, or to respond to unusual opportunities. Such activities may thus play 'hanging on' and 'linking in' roles.

A number of pointers from the survey data suggest that MW's livelihood contribution, particularly for poorer rural households in Zimbabwe, may also be most commonly characterised in terms of a 'hanging on' strategy. Mopane worm outbreaks coincide with the 'hungry season' (when the previous year's food stocks are depleted, particularly for households farming in low rainfall areas and when newly planted crops are still too young to harvest which coincides with a time of high seasonal cash needs (the Christmas period and the start of the new school year). For the poorest households MW are likely to be important in helping them 'hang on' at the margins of survival through this difficult time. These households, who often have limited non-farm income sources, may identify mopane as their most important source of income. Further, the main use of this income is to fund seasonal consumption needs.

For other households who are not so badly off (generally due to higher livestock holdings, larger cultivated area, or a regular source of non farm income or remittances) the mopane worm business generates subsistence and cash income that funds not only essential consumption goods but also small purchases (kitchen utensils, clothing), investment in education (human capital), visits to relatives (social capital) and small-scale farm and non farm activities (petty trading, vegetable gardens, membership of informal credit groups etc). Information on how collectors used mopane income from the 2001/2002 harvest suggests that quite a few collectors were able to fund 'linking in' type of activities'. Its role here, however, is likely to be limited. For most collectors the income earned from MW sales is not sufficient to fund investments in other livelihoods. Although some households mention using income from MWs to invest in agricultural inputs and small livestock purchases those that mention such investments generally acknowledge that mopane worm income is not the most important source of income used for these investments (See Table 17).

There are, however, a few better off households for whom trading MW (buying from other collectors and trading locally or in outside markets) may provide opportunities to earn sufficient income to invest further in the MW trading business, (e.g. holding stocks, increasing size of business, value added processing etc). Here MW trading (rather than harvesting and processing) plays a 'stepping up' role, or a 'stepping out' role if income from mopane trading is invested in, for instance, livestock, cash cropping, non-farm activities, post school training (human capital), and assets for other business such as shops or vehicles (physical capital). Generally it was more common for income from mopane worm trading to play a 'stepping out' role funding investments in alternative means if increasing income rather than a 'stepping up' role. This is consistent with the observation that income from mopane worm activities is both seasonal and variable from year to year and therefore not a very reliable business activity. Levels of mopane worm harvesting and reported use of MW income also indicate that currently more harvesters in Botswana than Zimbabwe use mopane worm activities in a 'stepping out' and/or 'stepping up' role.

This discussion of the different roles that MW harvesting and processing and MW trading may play in the livelihoods of different people is, we suggest, helpful as we turn to consider the potential for livelihood improvement through technical and institutional innovations. We need primarily to look for innovations that support the 'hanging on' roles of MW harvesting and processing. We also need to look for innovations that may facilitate their role in 'linking in' with other activities, perhaps catalysing a shift towards 'stepping up' or 'stepping out' through other livelihood activities. However, this is likely to require, among other things, improvements in marketing systems, and here we need to understand the roles of MW trading in the livelihoods and business of rural and urban based traders. Table 19 therefore presents in more detail the principle

roles of MW by livelihood strategy, together with problems and constraints identified from the research findings (described in section 3). The final column, suggesting possible development opportunities, anticipates to some extent issues raised in the next section, where we discuss priorities for technical and institutional innovation.

5. Principle roles of Mopane Worms by livelihood strategy, problems, constraints and opportunities

The principle roles of mopane by livelihood strategy, problems and constraints identified from the research findings (described in section 3) together with potential development opportunities are summarised in Table 19.

For households where mopane worms play primarily a 'hanging on' role problems such as variable and unreliable outbreaks and low market returns dominate. These households are cash constrained and unlikely to be able to afford even low cost technology for improving productivity of MW harvesting or processing. In addition, the small quantities of MWs offered for sale and economies of scale associated with selling in alternative markets limit their ability to access outside markets. Improved returns for such households are likely best achieved through group or cooperative efforts to undertake some of the market functions currently provided by middlemen and traders . Organised collective action to manage and protect mopane resources is also of vital importance.

Households for whom MW activities play a 'linking in' role , demonstrated by the fact that some income from MW trade is used to fund some lower order 'stepping up' and 'stepping out' investments, face similar problems and constraints as those households for whom MW activities play a 'hanging on' role. However, financial constraints are not so limiting for these households. They will benefit from economic opportunities offered by group action and the protection and management of mopane resources but in addition they are likely to be able to participate in both process upgrading (low cost technology to increase efficiency) and product upgrading (improving existing MW products and introducing new MW products).

For MW collectors involved in the 'stepping up' strategy development opportunities lie mainly in the area of providing skills training in business management, tried and tested innovations and access to micro finance to support valued added processing activities (process upgrading) , adding value by assuming new functional roles and responsibilities (function upgrading) and product upgrading.

Where market income from mopane worms is used by households to fund investments in other income generating activities ('stepping out') development initiatives can play a dual role. On the one hand, the MW market income of such households is directly enhanced by initiatives that improve resource management and output value but, in addition, success in improving the livelihoods of all collectors will create local demand for goods and services and provide investment opportunities for new businesses.

Table 19. Contribution of mopane worms to livelihood strategy, problems, constraints and opportunities

Contribution of MWs	Identified Problems	Constraints	Development Opportunities
'Hanging on' strategy			
Harvest for food and cash	Variable and unreliable outbreaks. Local abundance insufficient to satisfy needs and competition from outside collectors. Long distances to other al sources of MWs. Labour intensive and uncomfortable processing, shortage of firewood for cooking and delays in drying due to rain.	Deforestation of local Mopane woodlands in some areas Episodic nature of MW outbreaks MW outbreaks coincide with busy agricultural period Unaffordability of protective clothing No improved technology for processing	Organised collective action to manage and protect resource. Negotiated access to state and private MW resources Household scale MW breeding facilities. Low cost improvements in processing (e.g. protective clothing, training in handling hygiene)
Sell or exchange bulk of harvest. Sales to provide income for seasonal consumption needs Barter for basic consumption goods (grains) and small households goods (kitchen utensils) and clothing.	Sell at low prices in post harvest period. Involvement in barter trade on unfavourable terms. Limited market power, buyers dictate prices. Sell in local markets, often from home, resulting in lowers than average net value Very limited participation in value adding activities except post harvest drying.	High seasonal food and cash demand increases perceived value of post harvest sales and reduces benefits of delaying trade for better prices. High marketing and transaction costs limit access to alternative markets, especially in remote areas and for sellers of small amounts	Empower sellers by providing appropriate skills training in negotiating, price searching and marketing. Reduce marketing costs through group marketing (informal or formal). Increase market power of sellers through local institutions. Develop niche markets that provide fair trade price and/ or enhance net value to collector.
'Linking in' strategy			
Harvest for food and cash Sell or exchange bulk of harvest to fund: -seasonal needs (e.g. food and school fees) -acquisition of small items (e.g. kitchen utensils and clothing) -lower order 'stepping up' MW activities (e.g. move own MW to urban mkts (add space value))	Processing problems 'as above'	Opportunity constraints 'as above' Financial constraints not as critical but individual output and/or financial resources insufficient for technology requiring medium/high capital	Potential resource management opportunities 'as above' Low cost innovations (e.g. roller, drying racks) to increase efficiency. Producer groups formed to share lumpy capital investments (cleaning drum, improved cooker, solar drier, improved storage facilities).

lower order 'stepping out' investment activities (e.g. cash crops, small stock, vending, secondary education, off farm migration) - investment in social capital (e.g. visits and gifts to extended family) on-farm storage for sale and consumption out of season .	Low prices due to any combination of the following - poor market access, little competition among MW buyers , poor negotiating skills, absence of market information, small quantity offered for sale by individual collector. Unreliable income source due to uncertainty and sporadic nature of MW outbreaks	High marketing and transaction costs limit access to alternative markets , particularly for collectors in remote areas. Opportunity cost of allocating family labour to collecting and marketing MW may be high, particularly during the first harvest period and if dependency ratio high.	Economic opportunities 'as above' Micro finance for specific MW activities
'Stepping up' strategy			
Harvest for food and cash . Buy MWs from other collectors	Processing problems 'as above' Competition from outside traders	Opportunity constraints 'as above' Unregulated open access resource & no way of protecting investments. .	Potential resource management opportunities 'as above'
Sell or exchange bulk of harvest to fund: -seasonal needs (e.g. food and school fees) -acquisition of small items (e.g. kitchen utensils and clothing) -lower order 'stepping up' MW activities (e.g. move own MW to urban mkts (add space value)) -higher order 'stepping up' MW activities (e.g. local trader, trade in bulk in outside markets; buy to store for selling out of season) - accumulate assets for MW business (e.g. protective clothing, processing technology , vehicle)	Price uncertainty, working capital requirements , availability of transport and storage. Seasonal of business	Minimum level of trade required to share overhead marketing and transaction costs associated with accessing higher value markets . Imperfect knowledge of prices in alternative markets. Generating sufficient turnover to warrant specialist ion and investment. High cost of dedicated storage structures Variability in supplies from year to year discourage MW specific capital investments Lack of tried and tested processing innovations	Economic opportunities 'as above' Skills training in small business management Development of appropriate processing technologies to enhance product value Micro finance for trade and value adding processing activities
'Stepping out' strategy			
Harvest for food and cash . Buy MWs to trade			Potential resource management opportunities 'as above'
Market income used to finance working finance	Availability of MW supplies	Potential to generate market income constrained	Economic opportunities 'as above'

and capital investment for other income generating activities (e.g. diversify traded commodities, cash crops, rearing livestock, buying property to let, capital assets)	Competition from outside traders Slow seasonal and unreliable accumulation	by reliability and availability of MW supplies Market income tends to be invested outside of community due to absence of effective local demand for goods and services due to poverty Slow, seasonal and unreliable accumulation	 Largely outside scope of an individual project but success in efforts to enhance income form MWs will create greater local demand for good and services. Development of micro – finance institutions.

5 Research Implications

5.1 Priorities for technical and institutional innovation

In discussing the role of NTFPs in general and MWs in particular in poverty reduction, it is important not to over generalize. – different narratives will be appropriate in different areas since the natural and socio economic environments in which the rural poor are located vary. In addition, as this paper has shown, the same forest resource may play varying roles in different types of livelihood strategies. But, development initiatives need to be consistent with three important areas that directly address the needs of poor people (World Bank, 2000).

- ***Promoting opportunity***:
- ***Facilitating empowerment***
- ***Enhancing security***

Development opportunities for MWs have the potential to contribute to all three areas. Technical innovations and development of market opportunities promote income growth. Organized collective action to manage and protect community mopane resources enhances the security and sustainability of the natural resource base on which rural households rely. Providing sellers with appropriate skills training in negotiating and marketing strengthens the ability of poor people to shape decisions that affect their livelihoods. Different types of technical and institutional innovations must however be matched to the resources, aspirations and constraints of current livelihood strategies of the resource users. Resource management options need to take into account the opportunities and constraints offered by mopane resources under different tenure arrangements and training has to provide skills that address practical needs in current activities.

Households involved primarily in the 'hanging on' strategy are likely to be looking for greater security (less risk) and improved returns on MW sales. They are unlikely to be able to afford even low cost technology to improve productivity. These goals are best achieved perhaps through institutional and organisation initiatives to both manage mopane resources in a sustainable manner and improve market value. Skills training in handling hygiene and price negotiating are likely to meet felt needs.

Other households, who are not so badly off, may be looking for increased productivity and ways of generating increased market income to act as a catalyst or spring board for households to link in

to the 'stepping up' and /or 'stepping out' strategies. These households are more likely to be interested in technical developments and skills training to increase efficiency particularly if producer groups are formed to share the cost of lumpy capital investments and to benefit from economies of scale in marketing or value added processing.

For better off households, already involved in 'stepping up' and/or 'stepping out' strategies opportunity to generate additional market income from MWs may require particular managerial or technical skills, or access to capital or credit, that are generally not available to the majority of rural producers. Micro finance and business skills training provides entry points for enhancing the activities of these households.

5.2 Concluding comments

If profitability and productivity of MW activities increase (e.g. through new technologies, or improving prices realized by collectors), then there are dangers of

- Capture of the resource by the better off, with exclusion of the poor.
- Over exploitation of the resource

The difficulty of achieving a balance between improving livelihoods of the poor rural households and sustainable use of forestry resources can be addressed by improving the framework conditions (property rights, institutional arrangements) that govern the use of common property resources and by supporting communities to establish indigenous natural resource management systems. .

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Tabulated Data

Table 1 Demographic and socio economic characteristics of study communities in Zimbabwe

	Matableland S.		Masvingo			Midlands
	Matobo District		Mwenezi District	Chivi District	Chiredzi District	Mberengwa District
	Kapeni	Ndiweni	wards	Gwerima	Chilonga	Bangwe
No. of households Surveyed	35	25	51	42	30	41
Mean Household size	7.2	6.1	7.0	9.7	7.5	7.5
(std dev)			(2.0)	(3.6)	(2.4)	
Household Composition						
Adult male (%)	11	18	24	22	30	20
Adult female (%)	26	27	24	26	34	22
Children under 18yrs (%)	63	55	52	52	36	58
Male headed (%)	45	76	43	41	50	43
Female managed (%)	37	16	33	21	30	49
Female headed (%)	18	8	24	38	20	8
Land holding (acres)	4.7	3.8	6.5	7.4	5.0	na
land cultivated 2002 , mean	3.7	2.9	4.2	5.7	3.5	na
(std dev)			(1.45)	(2.1)	(1.46)	na
Mean cattle numbers	6.6	3.1	4.7	4.0	4.8	na
			(3.6)	(3.9)	(3.4)	na
Mean goat holding	6.8	6.6	4.6	na	13.6	na
			(3.5)	na	(5)	na
Non cattle owners (%)	37	52	26	31	13	39
Donkey owners (%)	60	28	63	88	72	53
Goat and sheep owners (%)	86	92	84	100	97	63
Households with no lvstk	na	na	12	0	3	na
Plough ownership (%)	na	na	69	79	83	73
Scotch cart ownership (%)	na	na	35	60	60	27
Wheel barrow ownership (%)	na	na	57	32	83	51
Bicycle ownership[(%)	na	na	Na	59	67	22
Solar panel ownership (%)	na	na	Na	48	77	5
Radio ownership (%)	na	na	Na	62	100	54

Table 2: Involvement in Mopane worm harvesting and utilization, 2001/2002

		Matableland South		Masvingo			Midlands
		Matobo District		Mwenezi District	Chivi District	Chiredzi District	Mberengwa District
		Kapeni N=35	Ndiweni N=25	Mwenezi N=51	Gwerima N=42	Chilonga N=30	Bangwe N=41
Collecting	%	100	84	96	100	80	76
Collecting but not consuming	%	0	0	10	7	0	22

Table 3:Proportion of residents involved in MW activities by gender and age composition, Mwenezi study area, Zimbabwe, 2001/2002

MW activity	adults Over 33yrs		adults 18-33yrs		Youth 12-17yrs		Youth 5-11yrs	
	M N=22	F N=39	M N=21	F N=28	M N=39	F N=40	M N=17	F N=17
Collection only	27.3	5.1	4.7	3.5	30.7	2.5	29.4	0
collection and processing	4.5	89.7	28.6	92.9	66.7	92.5	23.5	70.6
selling	4.5	76.9	33.3	75.0	64.1	70.0	17.6	35.3
Buying	0	25.6	14.3	25.0	12.8	12.5	5.9	5.9
consuming	95	94.9	76.2	85.7	92.3	87.5	82.4	70.6

Table 4 Involvement of residents in MW activities by gender and age composition, Chiredzi, study area, Zimbabwe, 2001/2002

MW activity	Adults Over 55yrs		Adults 33-54yrs		Adults 18-33yrs		Youth 12-17 yrs	Youth 6-11 yrs
	M N=8	F N=10	M N=20	F N=27	M N=41	F N=40	N=47	N=25
Collection and processing only	4	10	10	13	5	37.5	64	40
Collection processing and Marketing	10	50	25	74	59	42.5	5	0
Marketing only	13	10	40	13	37	2.5	0	0
Buying	33	30	60	57	62	40.0	0	0
consumption	61	70	??	91	70	77.5	61	63

Table 5 Extent of involvement of different categories of people in the use of mopane worms , in two villages in Matableland South, Zimbabwe, 2001/2002

	Kapeni			Ndiweni		
	Youth	Women	Men	youth	women	men
Individuals interviewed	160	66	27	80	45	27
Involvement in use of MWs (%)	54.4	98.5	74.1	46.3	60	74.1

Table 6 Quantity of MW harvested by category of household in

Matobo District, 2001/ 2002, kgs per hhld

Social Class	Kapeni N=35	Ndiweni N=21
All households	65.5	49.4
Better Off households	48.7	28.5
Poor households	74.3	52.9

Table 7 Collection of MWs by wealth category, 2001/2002, mean kgs per hhld

Wealth Catgeory	Masvingo			Midlands
	Mwenezi District	Chivi District	Chiredzi District	Mberengwa District
	Mwenezi N=51	Gwerima N=42	Chilonga N=30	Bangwe? N=41
Bottom 25%	53.8 (47.5)	228.5 (58.6)	65.4	36.5
Next 25%	37.0 (44.0)	224.1 (90.4)	80.4	37.9
Next 25 %	48.9 (39.6)	172.2 (103.9)	85.8	27.6
Top 25%	56.3 (53.6)	222.0 (103.9)		14.4

Standard deviation in parenthesis

Note: Wealth groups in Chilonga were defined in thirds

Table 8: Collection of MWs by type of household head, 2001/2002, mean kgs per hhld

Status of Head	Masvingo		
	Mwenezi District	Chivi District	Chiredzi District
	Mwenezi N=49	Gwerima N=42	Chilonga N=30
Male headed	54.7 (48.2)	208.2 (77.4)	82.0 (53.36)
Female managed	34.5 (47.2)	269.7 (88.3)	35.3 (57.3)
Female headed	58.5 (49.2)	184.5 (103.6)	128.0 (43.04)
Sample mean	49 (48.3)	217 (96.4)	77.2 (60.7)

Standard deviation in parenthesis

Table 9: Collection of MWs from different sources and share of collectors who identify specific area of MW as main source of harvest, Zimbabwe, 2001/2002

Source of Mopane worms	Matableland South Matobo District				Masvingo						Midlands	
					Mwenezi District		Chivi District		Chiredzi District		Mberengwa District	
	Kapeni		Ndiweni		Mwenezi		Gwerima		Chilonga		Bangwe	
	%	% main	%	% main	%	% main	%	% main	%	% main	%	% main
Around Homes	na	92	na	13	59	4	na	12	25	na	19	0
Grazing Areas	na	9	na	30	37	4	na	19	8	na	16	10
LSCF's	0	0	na	57	96	92	88	69	27	na	90	90
State forest	0	0	0	0	18	0	0	0	91	na	0	0

Table 10: Quantity of MW collected in kgs from each source, Chiredzi rural area, Zimbabwe2002

Source of mopane worm	Total Quantity collected		% share
	20l tins	Est kgs	
Around homesteads	29	173	17.6
Grazing area	18	108	4.6
Large scale commercial farm	56	336	14.5
State Forest (Epungeni)	283	1698	73.3
Total	386	2316	100.0

Table 11*:* MW Processing methods, in two survey areas 2001/2002

Processing methods	**Masvingo**	
	Mwenezi District	Chivi District
	Mwenezi	Gwerima
Degutting (% collectors)		
Hand	74	29
Bottles	14	42
Sticks/stones	4	24
Starving MW	0	5
Charcoal heat	18	0
Washing (%collectors)		
River water	17	33
Boiled water	65	48
No washing	18	19
Cooking (% collectors)		
Boil then sun dry	65	64
Roasting	33	36
Clay pot on fire	2	0

Table 12: Average quantity of MWs harvested in study areas (kgs per hhld), Zimbabwe 2001/2002

	Matableland South Matobo District		Masvingo			Midlands
			Mwenezi District	Chivi District	Chiredzi District	Mberengwa District
	Kapeni	Ndiweni	Mwenezi	Gwerima	Chilonga	Bangwe
Average all hhlds	66	50	49 (48.3)	217 (96)	77 (60.1)	27
Average collecting hhlds	66	52	50.8 (48.3)	217 (96)	97 (52.0)	36

Table 13. Average quantity of MWs harvested over four years in Kapeni and Ndiweni villages, Matobo District, Zimbabwe, kgs per hhld

Harvesting Season	Kapeni	Ndiweni
1998/99	35	46
1999/00	36	51
2000/01	5	6

2001/02	66	50

Source. Calculated from Tables 7 and 8, Gondo and Frost (2002).

Table 14: Mopane worms utilization, study areas, Zimbabwe, 2001/2002

Use of MWs		Matableland South Matobo District		Masvingo			Midlands
				Mwenezi District	Chivi District	Chiredzi District	Mberengwa District
		Kapeni	Ndiweni	Mwenezi	Gwerima	Chilonga	Bangwe
Sales	%	81	63	86	61	59	50
Barter	%	13	25	1	22	19	26
Gifts	%	0	neg	8	4	5	neg
Consumed	%	6	12	10	9	9	24
In storage	%	neg	Neg	10	4	9	neg

Table 15: The number and proportion of sales made at different locations, in study areas, Zimbabwe, 2001/2002

	Matableland South Matobo District		Masvingo						Midlands	
			Mwenezi District		Chivi District		Chiredzi District		Mberengwa District	
	Kapeni	Ndiweni	Mwenezi		Gwerima		Chilonga		Bangwe	
Place of sale	% no.	% no.	% no.	% qty	% no.	% qty	% no.	% qty	% no.	% qty
Collection Area	0	Na	0	-	10	11	2	1	0	-
Homestead	45	Na	24	21	38	24	6	8	85	60
Local centres	55	Na	59	36	38	46	11	7	0	-
Main roadside	0	Na	0	-	13	15	0	0	0	-
Urban centre	0	Na	17	43	10	4	55	49	15	40
Outside country	0	na	0	0	0	0	19	35		

Table 16: .Main reason for collecting MWs , three study areas, Zimbabwe, 2001/2002

Main Reason for collecting MWs (% collectors)	Masvingo		Midlands
	Mwenezi District	Chivi District	Mberengwa District
	Mwenezi	Gwerima	Bangwe
Food in season	16	7	7
Food out of season		0	0
Sell for cash	84	67	93
Exchange for goods	0	24	
Gifts to relatives	0	2	Na

Table 17: Use of income from Mopane sales, Zimbabwe study areas, 2002

Income Use	Masvingo						Midlands	
	Mwenezi N=45		Gwerima N=42		Chilonga N=30		Bangwe? N=31	
	% hhld	% 1st	% hhld	% 1st	% hhld	% 1st	% hhld	% 1st
Buy food grains	82	40	90	35	53	na	36	16
Buy other food	84	36	93	39	67	na	68	28
Buy agric Inputs	73	11	73	12	60	na	48	16
Buy agric implements	36	7	39	7	3	na	na	na
Buy cattle	7	0	7	0	0	na	na	na
Buy goats	22	2	24	0	3	na	na	na
Medical expenses	71	2	78	2	na	na	32	0
Funeral expenses	na	na	na	na	0	na	68	0
School fees/stationary	78	38	85	41	60	na	48	12
Travel	73	4	81	5	40	na	12	0
Buy clothes	71	11	78	2	23	na	88	36
Buy household utensils	80	64	88	70	na	na	56	12
Buy durables	na	na	na	na	3	na	68	8

Note: 1st means the share of households who indicated that income from MW sales was the main source of cash for this expenditure. For example, 82% households in Mwenezi used income form MW sales to purchase food grains, and 40% of households indicated that this income source was the most important source of income for purchasing food grains.

Appendix Six

Chivi Wood Carvers Associations: A Case Study of New Institutional Arrangements for Sustainable Exploitation of Indigenous Hardwood

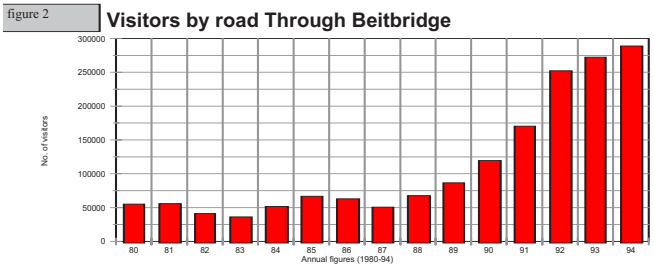
W. Standa-Gunda[1] and G.D. Mudimu[2]

1. Identification of case.

Life in rural areas is a constant shift of emphasis amongst different productive activities. Within this production mix, natural resources makes an important contribution to the well being of Communal Area households. These natural resources, largely under common property tenure regimes, need to be carefully managed to ensure that they continue to provide for households needs in the future. To develop and administer practical management plans for these common property resources, it is important for relevant authorities to know; a) what resources are available to the households and to the community; b) how households and communities use these resources to satisfy their needs; c) how, in using their natural resource base do households and communities impact on this resource base and; d) the nature of relevant institutions and organizations and how these transform in changing resource use patterns. This case study focuses on increased use of Non-Timber Forestry Resources (NTFR) in the productions of craft products by rural households and how institutions and organizations have adapted to these changes in use patterns.

There was a steady rise in the number of craft markets along the Masvingo-Beitbridge road over the period 1980 to 1997 with a significant increase in the stalls established in the 1990s Generally, Zimbabwe's tourism boom and an increase in the number of tourists using the Masvingo-Beitbridge road stimulated an increase in the number of carvings being bought (Figure 2). A survey of buyers has shown that most of the products bought are by people from South Africa using road transport. This trend in the purchasing of carvings has been made more so due to the favorable rate of exchange soon after the devaluation of the Zimbabwean dollar in the 1990s, increasing the purchasing power of South African visitors.

figure 2



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2. The initial situation

The early history of the wood carving enterprises can be summarized as being haphazard, without any rules and regulations to monitor access to communally owned resources. Under those circumstances the depletion of selected hardwood species from woodlands(namely, *Pterocarpus angolensis*-Mukwa, *Afzelia quanzensis*-Pod mahogany and *Combretum imberbe*-Leadwood) was almost inevitable. The only control to resource access was some outdated pieces of legislation drafted in 1941, 49 and 81. The Chiefs who once controlled access to forestry resources were no longer in a position to effect their traditional powers as this was removed by government after independence (Communal Lands Act of 1981). Since it has become difficult to police formal government rules on resource use due to cuts in government expenditure, local rules based on taboos, myths and inter and intra-group allegiances had not been spared as they faced legitimacy problems. These problems were heightened by retrenched people from the urban areas with no proper socialization to these forms of control. According to existing national legislation, communally owned resources can only be harvested for domestic use, not for sale. The new group of harvesters (carvers) started commoditization of carved products, in contrast to existing use patterns that had old men and women producing household use items like wooden pillows, spoons, hoes, stools and yokes. The resultant resource use conflict amongst villagers (those in the commercial wood carving enterprises and the older generation producing products of use value) only increase the cutting down of trees.

To add to the villagers' woes, no government department was clear on which policy to take on the issue. The ministry responsible for employment creation and youth cooperatives saw the advent of the industry as a way out of rural poverty but the Forestry Commission viewed the industry as a scourge on the woodland resources. The Rural District councils who are the official custodians of these communally owned resources, having no manpower to police the "illegal" use of forestry resources, took a back-bencher's position as all the pieces of legislation at their disposal were not adequate enough to halt the depletion of the indigenous hardwoods being carved.

Under the prevailing situation no one was accountable to anyone. The only limiting factor to resource harvesting in that scenario was the distance one had to travel to gain access. With time people with influence in the local community would have the ultimate say as to who would harvest which tree, even trees customarily believed to be sacred. The better placed rich people took advantage of the state of "lawlessness" by making resources inaccessible to the poor.

3. The change process

Increased commercialization resulted in more wood being used for carving purposes. This increased the pressure on the resource base as the number of participants in these enterprises increased. Resource scarcity accounted for the increased value of the hardwoods that are being used for carving. This value is at times twice the official wood prices set by the national Forestry Commission. Thus, the potential incomes from these activities can never be over looked. To curb the increase in the number of people utilization the woodland resources, some form of barrier to entry into the market chain of these enterprises become necessary. People involved in carving started forming organized groups which operated on set rules and regulations. This was the dawn of a new era for the carving enterprises. As a local initiative with local mandate, these cooperatives have gained respect from the most unlikely of sources. Formerly labeled as illegal activities, the Rural District Council has sanctioned the operations of those properly constituted enterprises by giving them access to council cut wood logs. This move helps in reducing the illegal cutting down of trees from communal woodlands. Given the prior hostile climate between the council and the resource users this can be seen as a very favorable development that can foster further joint resource management plans. With the assistance of some NGOs, some individuals and

cooperatives have managed to set up small plantations of those indigenous hardwoods frequently harvested for carving purposes. With increased awareness of the existence of the industry, the Forestry Commission in a dramatic move has refrained from the policing of natural resource. Their new approach is to foster efficient woodland use patterns by freely giving forestry extension and advisory role to resource users. The Commission now makes seedlings and fences available to carving cooperatives. By so doing, the Forestry Commission is not only sustaining the survival of the indigenous hardwoods but also sustaining an emerging household livelihood system.

Though with different motive to the development of new institutions, all stakeholders in the woodcarving case study seem to have contributed significantly to the initial steps of finding good conflict resolution mechanisms to competing resource uses. Institutional change was inevitable. Resource scarcity, the need to survival and the institutional vacuum that existed forced stakeholders to take a fresh look at how sustainable their activities were.

4. Major outcomes

The major outcomes of these joint approaches to economic and ecological problems, have been improved relations and reduced suspicions amongst different stakeholder groups affected by the harvesting of the resources. The Ministry of Nation Affairs and Employment Creation has appreciated the importance of these enterprises on household and community economies by giving cooperative members some form of training on management, accounting and record keeping. The ministry has also helped in the marketing of carved products at national and international conferences. This helps the carvers in getting the best prices for their products. With higher incomes from fewer products, the propensity to harvest more trees as a survival technique is reduced.

Conflicts between different users of the communal woodland resources though still evident, many people now appreciate the need for dialogue in addressing these conflicts. With carvers taking the initiative in the planting of depleted indigenous hardwoods, other members of the community are only eager to learn from the carvers' experiences.

The creation of an umbrella union for 28 enterprises involved in wood carving has meant some level of control for the participants, which was never the case in previous times. The creation of the union and cooperatives has resulted in poor and less capable members having access to capital and wood resources on a better footing than before. Due to the improved institutional arrangements of the enterprises, we foresee an increase in the incomes of individual participants and more controlled access to woodlands.

Improved product quality, information flow and marketing enhenced individual incomes from these enterprises. As agricultural incomes are seasonal, the incomes from the sale of wood carvings improved household and individual financial positions. Recurrent household needs (eg. school fees, grinding mill and groceries) could now be met without necessarily selling major household assets like cattle. Earning an average of US$25 before the change in institutional arrangements, some carvers now get as much as US$75 a month from their sales.

5. Lessons

Although they sometimes experience legitimacy problems, "home grown" institutions are better suited to meet the needs of local people in their endeavors to over come resources use conflicts, and local level management of resources. However the success and effectiveness of these institutions hinge on the agendas of those involved in their creation and the general stakeholders. In our case, the positive

contributions from NGOs, and government departments in giving technical and financial assistance to these emerging institutions is viewed as important to the initial thrust and effectiveness of these institutions. We have also conceptualized the idea of a cycle in the development of institutions that emerge under circumstances of sudden increases in commercialization of communally owned woodlands. The initial scenario is when there is no resource scarcity due to limited extraction. In this case there is no meaningful local rules existing to govern the utilization of the resource. Hence the sudden growth in forest-based rural enterprises usually occur in a situation of relative institutional vacuum. Then with diverse socio-economic and political factors, the need arises to commercialize woodland resources in the rural areas. The thrust of commercialization is initially monopolized by urban migrants. These migrants do not take any reverence to traditional rules of resource harvesting and this leads to the collapse of any form of natural resource institution that might have existed. The circumstances under which rules and regulations emerge though differ in time and space, the involvement of the local participants is important in developing new efficient, relevant and effective institutions.

This case is peculiar to rural economies in less developed countries. Their transitional economies from mainly agriculture to other off-farm activities amongst other things result in the increased use of woodland resources. During this transition (Economic Structural Adjustment Programmes) there is reduction in government spending. Policing of natural resource use patterns by government officers with no transport and low salaries does not help the ideals of sustainable natural resources management. This jeopardizes the effectiveness of many government monitored rural institutions. This leaves the local community as the most appropriate local level management institution for most communally owned woodland resources. In this light joint natural resource management strategies involving local communities, government and NGOs, are important in mapping-up new institutional structures that are relevant to changing resource use patterns.

Though the determinants of institutional transition in the wood carving enterprises might be unique, it is important to understand how globally, rural households adapt to national and at times global forces in mapping out their survival strategies. It is our hope that the initial steps taken in forming relevant institutions in Zimbabwe's woodcarving enterprises is a milestone in achieving ecological sustainabilty and at the same time uphold the livelihood systems of rural communities.

Appendix Seven

AGRICULTURAL COMMODITY MARKETING IN ZIMBABWE

Kay Muir-Leresche and Chiedza Muchopa*

EVOLUTION OF AGRICULTURAL MARKETING

Government intervention in marketing , established during the depression in the 1930s, was introduced to keep farmers on the land. It was biased in favour of small-scale white farmers. Producer prices were subsidised initially by consumers who paid prices above import parity and by the communal farmers and large-scale farmers who sold at low export prices. The direct price discrimination was discontinued after World War II but communal farmers continued to be disadvantaged by the location of marketing depots and by licensed agents who took advantage of their monopoly position.

This restrictive marketing system which prevented competition and encouraged uni-directional trade, is one of the principal causes of low rates of economic growth in communal areas. It created barriers to entry and discouraged the emergence of rural markets and private traders. The expansion of infrastructure and social services after Independence improved living conditions in rural areas. However, the highly centralised marketing and control continued in the 1980s reducing opportunities for rural growth and industrialisation. Price and input incentives increased agricultural output after independence but the rural areas remained undeveloped.

At independence, less than 5% of marketed output came from the communal farmers. But with the provision of input packs and the higher maize prices, smallholder maize production doubled over the 1979-85 period. Most of the increase came from a minority of smallholders in natural regions II and III.

The origin and development of the state agricultural marketing systems prior to liberalisation are outlined in Table 1[1]. In common with many countries, most of the agricultural commodities were controlled by State owned boards with *de jure* monopoly controls and in the case of Zimbabwe these were also *de facto.*

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* based on chapter prepared for Rukuni M, P. Tawonezvi and C.K. Eicher. (Eds). (forthcoming) Zimbabwe's Agricultural Revolution: Revisited. Harare. University of Zimbabwe Publications.

[1] See Muir (ed) 1983, Muir-Leresche 1998 and Takavarasha, 1994 for more detail on agricultural marketing in Zimbabwe.

Table 1 – Agricultural Marketing Boards Prior to Liberalisation

AMA (1967) discontinued	**Agricultural Marketing Authority**: Co-ordinated and arranged financing for the commodity boards. The AMA was dissolved in 1994.
GMB (1931) (Full control and monopoly on all internal and external grain trading reintroduced 2001)	**Grain Marketing Board:** controlled: maize (1931), sorghum (1950), groundnuts (1952), soyabeans (1969), wheat (1970), coffee (1972), sunflowers (1984), bulrush millet (mhunga) and finger millet (rapoko) (1950-60 and 1984). All decontrolled 1991-1994 except GMB remained a residual trading board for the purchase, grading, handling, transport, storage, disposal and all exports and imports of maize and wheat Until 1993 total monopoly on purchase sale and exports. Limited trading of maize within specified zones was allowed but not across zones. Although legally allowed to sell maize grain from depots, in practice no grain was sold locally until a little in the late 1980s. Some 60 percent of the value of all maize purchases in the 1980s came from communal farmers. Direct government subsidies to the Grain Marketing Board averaged Z$43.2 million per annum between 1980 and 1989. Grain Marketing Board subsidies in years of surplus, were directed towards producers (surpluses exported at a loss). In all other years producer prices were below parity and subsidies benefited mainly urban consumers or sustained marketing inefficiencies.
CSC (1938) (Structure unchanged 2000)	**Cold Storage Commission:** primarily responsible for the purchase, slaughter and distribution of cattle and external trading. Transport costs refunded to large-scale beef farmers. Residual buyer for sheep and goats. Historically important in developing poultry and pig industries which were decontrolled once established (Pilborough, in Muir 1983). The CSC also played an important role in cattle finance, drought relief and state cattle ranching. Only 5 percent purchases were from Communal Land farmers. Direct government subsidies to the CSC included consumer subsidies and losses on cattle finance and drought relief schemes. Averaged Z$47 million per annum between 1982 and 1989 assisting large farmers. Effective monopoly because of health restrictions on urban sales from other sources. Reduced enforcement and effective competition in urban areas from private abattoirs with access to imported equipment after 1994. Legal control of all external trade remains.
DMB (1952) (DZL (Pvt.) Ltd. 1996)	**Dairy Marketing Board**: *de jure* but after 1991 only *de facto* monopoly trading board in the purchase, processing, distribution and external trade of all diary products. About 1 percent of the value of all purchases from communal farmers. Direct government subsidies to the Dairy Marketing Board included consumer subsidies and averaged Z$34 million per annum between 1980 and 1990. Commercialised in 1993 and started making profits immediately– effective monopoly despite some small dairy competition.
CMB (1969) (Cottco (Pvt.) Ltd .1997)	**Cotton Marketing Board**: Monopoly trading board in the purchase, processing and export of all cotton products until after ESAP. The board required to fulfil local textile manufacturers requirements at set prices before exporting to best advantage. Well over 50 percent of the value of all purchases were from smallholders. In most years producers were paid **less than** export value, thus subsidising manufacturers and taxing smallholders. Deficit of Z$5.2 million per annum between 1980 and 1989. Commercialised in 1994 and some competition allowed.
TMB (1936) TIMB (1997)	**Tobacco Marketing Board:** *de jure* powers to determine where all tobacco is sold, including the amounts sold by any one farmer. The tobacco is sold on farmer-owned auction floors where bidding is open to all licensed buyers.

Source: Adapted from Muir in Rukuni and Eicher, 1994

There was little black market trading internally or cross-border. The state marketing system was strictly controlled and operationally efficient – it always purchased surpluses and it always provided sufficient maize to urban consumers. In Tanzania, Zambia, Kenya and other countries, the state marketing system sometimes failed to

purchase or pay for the surplus in years of plenty, and failed to make grain available for consumers in deficit years.

Although technically efficient, economically the state marketing system was highly inefficient and regressive, thus having negative effects on both growth and equity. These inefficiencies were brought about by monopoly power and pricing inefficiencies, by bureaucratic procedures and by the restrictions on trade between communities in different areas. Jayne, Chisvo and Rukuni, estimated that the marketing controls implicitly taxed the poorest rural people some 20-30% of potential producer prices in most years. The impacts of these distorting effects are highlighted in the section on producer prices.

Agricultural marketing parastatals incurred heavy losses in the 1980s and contributed to the increasing government debt. The losses were incurred as a result of the expansion of a system designed to service a few very large producers concentrated in NR II, into a system for a large number of small and widely-dispersed producers. These losses were exacerbated by the subsidies which predominantly favoured consumers and in some cases large farmers (Muir-Leresche, 1998).

Table 1 shows that most of the subsidies paid to the marketing boards accrued to large-scale farmers or urban consumers and were therefore, regressive. Despite the government objectives of promoting both growth and equity, the parastatal marketing system was inimical to both.

Producer Price Policy

Before 1970, producer prices were set at levels aimed at protecting producers, although there were a few years when they were set in favour of consumers. During the 1970s prices to urban consumers were subsidised in a bid to keep down wages and to buy political favour. In this period, groundnut and cotton farmers tended to be taxed whereas wheat farmers were heavily subsidised in order to achieve self-sufficiency. Maize prices declined along with maize output throughout the 1970s. [2]

Producer prices were set on a cost of production basis negotiated annually between the commercial farmers' union and the government. This encouraged a bias towards high-cost, high-yield technologies. In addition, the producer price policies prior to independence subsidised the capital-intensive commodities produced by white farmers and tended to tax smallholder crops such as groundnuts and cotton. The system was continued after independence, and the smallholder representatives were included in the annual price negotiation with the government. However, increasingly throughout the 1980s, producer prices were influenced by the state marketing board deficits, which, in turn, were influenced by the cost of establishing depots and collection points in uneconomic areas and by the low controlled selling price.[3]

Producer and controlled retail selling prices were set uniformly throughout the country and throughout the year. Farmers with access to the GMB markets, were, therefore, discouraged from maintaining on-farm storage. This increased the burden on state marketing boards and negatively affected growth and equity, since those able to sell early in the season (large scale farmers) benefited. However, smallholders lacked access

[2] Readers are referred to Muir-Leresche 1985 for a detailed analysis of price policy prior to Independence.

[3] The GMB selling price was controlled by the Min of Trade and Commerce for the benefit of consumers

to drying facilities and reliable transport making it risky to sell grain to the GMB at harvest and rely on repurchasing grain later in the year. The pan-territorial prices also encourage and the production of maize in remote, surplus areas rather than in deficit areas. They provide higher incomes to farmers in high rainfall areas and lower incomes to low-rainfall areas where yields are low (Muir and Takavarasha, 1988).

Maize is Zimbabwe's staple food, accounting for over 50% of the average calorie consumption. The agronomic conditions and Zimbabwe's geographical position make it difficult to determine an appropriate price for maize. Zimbabwe has highly variable maize yields[4]. Buffering policies to stabilise prices are considered politically essential for this commodity which plays such an important role in the national diet. The high bridging costs, however, make stabilisation policies expensive, since the difference between export and import parity is so high. The political repercussions of imported maize are particularly severe since the imports are normally the less-preferred yellow maize. Adequate supply of white maize is considered one of government's primary functions by the electorate.

In the 1980s maize meal was subsidised. Part of the subsidy was paid to the GMB to balance their trading account (selling price to millers being held below cost) and the balance of the subsidy was paid directly to the four major milling companies. Despite the monopoly role of the GMB and the legislation that prohibited cross-district trading, some rural hammer millers were operating in communal areas. These subsidies resulted in the closure of an estimated 200 rural mills as farmers sold their maize to the GMB and bought the subsidised maize meal from the urban centres. The subsidies were estimated at 60% of retail roller meal price whereas the local hammer-mill price would be only some 5% higher than the controlled price (Child, Muir and Blackie, 1985). The maize meal subsidy was rationalised on the basis of equity, despite its very high costs. The more remote areas did not receive access to the subsidised maize meal. Since it is these areas which house the majority of Zimbabwe's poor, the maize meal subsidy did not address equity.

The distortions which arose from the marketing controls and from the maize subsidy, reduced opportunities for small rural traders and urban millers to participate in the market. These distortions led to increasingly large subsidies to the GMB.

Institutional factors have exacerbated rather than dampened the effects of the weather, with real maize prices declining until a serious drought (Muir, 1985). In 1981 Zimbabwe had to import maize. In response, the government established a pre-planting price for the 1981 harvest of Z$120 (40% increase). Farmers responded enthusiastically to higher prices, the cessation of the war and increased access to credit and other of inputs. Maize sales to the GMB increased from 800 000 tonnes in 1980 to 2 million in 1981 and the government exported some of the surplus at a loss. For the next three years, despite poor rains, prices fell by 27% in real terms. In reaction to low maize stocks and the need to import, government increased prices by 30% for 1985 which led to another surplus. Prices were then held static in nominal terms until a severe drought in 1987, resulted in low stocks. By this time producer prices began to be based less on costs of production and past stocks and more on border prices and the market position, reducing the impact of fluctuations.

[4] The variation of production coefficient for maize in Zimbabwe is some 30% whereas SADC region is 19% (Pinckney, 1993)

Real maize prices declined during the 1980s[5] and it is therefore not surprising that formally marketed output of maize declined by 4% during the 1980s, when most other commodities expanded. Although real producer prices of all commodities declined, there was an increase in the production of export commodities responding to export incentives.

insert Table 2 here Real Producer Prices 1985-1991

In the processing and agro-industrial sectors, the price, exchange rate and regulatory policies of the 1980s reflect the influence of the small but powerful industrial lobby and favoured capital-intensive technologies and the formal sector. There was only a very small informal sector and no local competition because of the restricted access to imports. The centrist policies did not encourage competition and discriminated against new entrants, reducing the opportunities for achieving both growth and equity.

MARKET LIBERALISATION IN THE 1990S

Although the national policy documents were vague about decontrolling markets, agricultural market decontrol was one of the first areas to be addressed as part of the economic structural adjustment programme (ESAP).

In February 1991, Parliamentary changes to the marketing board constitutions, gave the boards greater autonomy in pricing and business decisions and by August 1991 independent Boards of Directors were established. In May, two commercial dairy co-operatives were given permission to market milk products and compete with DMB. In August, sorghum and millets were decontrolled becoming regulated crops for which the GMB would set floor prices and remain a residual buyer. In September private coffee marketing was permitted in co-operation with GMB. Cotton and groundnut farmers received supplemental payments so that final prices approximated export parity. Yellow maize had been partially decontrolled in 1990, with farmers free to sell to any domestic buyer. However, in 1991 farmers were threatened with the recontrol of yellow maize if they continued the switch from the controlled white maize to the uncontrolled yellow maize. The GMB announced plans to close more than twenty uneconomic depots but few closures were enacted at the time.

Insert Table 3 - Real Producer Prices 1991-1999 here

Agricultural output grew during the 1990s but then declined. The post reform period reduced the implicit taxes of the 1980s but there were other distortions and regulations that discouraged new business and competition. The adjusted NPCs for agricultural commodity exports in the 1980s averaged around 0.6 whereas in the 1990s they remained closer to 1, except for tobacco which varied between 0.8 and 0.9, depending on assumptions (Muir 1998).

Maize Marketing

The decontrol of the white maize market in 1992 was controversial . It started when the government allowed maize to be moved between contiguous communal areas. By February 1992, maize was allowed to be bought and sold in the arid regions (NR 1V

[5] Net protection coeffients all indicate producer taxes and declining real prices (Jansen and Muir, 1994)

and V), the GMB remaining a residual buyer at a set floor price. At the same time the movement of maize between non-contiguous communal areas was also permitted.

One of the most far-reaching effects of the restructuring of the markets occurred in 1992 with the removal of the subsidy on refined maize meal. This subsidy had only been available to large-scale millers and the industry was concentrated in the hands of three companies, two linked to multinationals (Rubey, 1995). The lifting of the subsidy and allowing smallholders direct access to urban markets , resulted in a rapid expansion in the numbers of small milling companies. By 1993, prices and domestic markets were decontrolled for all commodities except maize and wheat. Licenses had to be obtained for external trade in most commodities.

Maize marketing and prices were fully decontrolled on the domestic market by 1996 although the GMB remained the sole importer and exporter of maize (granting licenses for trade on its behalf). The GMB was mandated to set prices to operate as floor and ceiling prices to stabilise prices. The GMB was also required to hold national strategic grain reserves and to provide services to disadvantaged rural communities. Maize trading throughout the country was freed and all subsidies removed.

The marketing reforms performed better than even the most ardent free market advocate had anticipated. The market no longer operated along a single channel between major cities and the rest of the country. As the marketing of major commodities opened up, traders became established and marketing of other commodities and opportunities for local industrialisation, trade and exchange, widened.[6]

The decontrols were also effective because they were accompanied by the lifting of restrictions on foreign currency and imports, thus allowing for purchase of transport, processing equipment and other inputs by new entrants. Rural entrepreneurs were now able to take advantage of the investment made in road building in the previous decade. Producers, local processors[7] and rural traders continue to be hampered by the high tariffs on vehicles, taxes on fuels, unwieldy regulations and poor telecommunications. In addition, with little collateral and very high interest rates, access to finance continued to restrict entry. Anecdotal evidence indicates that in those areas with network access, cell-phone communication has increased market efficiency and resulted in some cross-country trading as a result of better access to information.

The multiplier and dynamic effects of maize market liberalisation appear to have been considerable as rural trading and processing expanded and communal area farmers became more active in commercialised agriculture toward the end of the century, and the informal sector throughout the country grew significantly in the 1990s.

Impact of Liberalisation on Producers, Processors and Traders

After price and marketing decontrol, small traders and multinational corporations began to offer marketing services to farmers. The first year of private trading following the good 1994 harvest resulted in producers being paid less than the GMB price by private traders in communal areas (ZFU Marketing Survey). However, the main advantages to producers of using private traders are instant payment, farm-gate collection, packaging and grading services and so farmers often prefer to use private

[6] There was a marked increase in the sale of traditional foods in urban areas.

[7] There was an increase of 115% in the number of hammer millers between 1992 and 1995. The surplus grain araews having the strongest response (Zim. National Hammer miller Status Study, USAID, 1996).

traders even at discounted prices. The 1995 harvest was poor and the prices paid to producers by private traders was more than double those paid by GMB by early 1996. Despite very good rains and large supplies, the prices did not drop the following year. The reduced inefficiencies in the maize market system appeared to offset the supply effect on price in the new free market system. Cotton farmers benefited from the intense competition between three large traders to purchase the cotton crop and prices rose despite relatively low international prices. As most of the cotton farmers are smallholders, the decontrol had positive impacts on both growth and equity. There were also beneficial effects for groundnut and other farmers with the expansion of local processing facilities. The activities of traders in the area and increased transport resulted in increases in horticultural sales and in the more widespread marketing of wild fruits, insects and small mammals.

Efforts to commercialise the GMB highlighted the conflicts between having to be profitable, holding buffer stocks and stabilising prices. Most farmers benefit from the GMB's continued provision of a safety-net as a buyer of last resort and at the same time take advantage of a more open trading environment. The producers negatively affected by decontrol and commercialisation are small, surplus farmers in remote areas where the GMB depots closed down. These areas have high transport and transaction costs with a few scattered farmers producing small surpluses. Until the infrastructure improves and larger more consistent supplies of commodities and/or higher-value outputs are produced, it is likely that these areas will remain undeveloped. In the poor rainfall, deficit areas, the producers benefited from the opening of markets and even the closure of depots since they could now legally take advantage of the high demand for grains in those areas.

The most remarkable result of decontrol was the significant increase in rural and urban small-scale millers, the increase in the number of rural traders and the opportunities for growth with equity as the multiplier effects and options for local specialisation and exchange expanded. The supply response was almost immediate and occurred despite the high interest rates which particularly affect new enterprises, the stringent health regulations[8] and the many other bureaucratic and financial problems facing their entry. Barriers to entry for rural traders are significantly reduced by the lack of any licensing requirements thus allowing the market to be more competitive than in those countries where traders have to be licensed. There is some lobby for licensing to reduce operations of unscrupulous traders and to raise local district revenues. However, experience elsewhere indicates that the transaction costs imposed by a licensing system would outweigh any benefits from the controls.

Impact on Consumers

The removal of subsidies, particularly on maize meal (roller meal), were expected to have negative income effects for the poor - certainly in the short term. In fact, the informal sector moved into the milling industry so rapidly that there was only a very short period when rough milled maize (hammer-milled or straight run) was difficult to

[8] There are over 23 stipulated requirements to meet urban health regulations. These are broadly applied to all food processing and many of the requirements are unnecessary. Their existence, however, makes investors vulnerable to arbitrary closure by politicians and bureaucrats with other agenda. The regulations may even be inappropriate to large, industrial manufacturers. They were introduced during the era when prices were controlled and based on costs of production such that their costs were borne by consumers or government subsidies and attracted no objections from the industrialists.

obtain. These less refined products were produced at prices similar to those of the previously subsidised, refined, industrially-milled, roller-meal (Rubey 1995). It was estimated that in January 1992 only 5% of urban consumers purchased some straight-run meal but surveys indicate this had climbed to over 80% of the urban population by 2000.

Despite the lifting of the subsidies, real selling prices of maize were slightly lower than they were before the reforms. Although the nominal price of roller meal increased substantially, the option to purchase grain reduced basic food costs by making cheaper hammer-milled meal available(Muir, 1998). Poor consumers benefited from decontrol nutritionally and financially.[9] The increased availability of hammer-meal at 60-75% the cost of roller meal helped offset the adverse effects of liberalisation on consumers. However, the large scale millers[10] continued to get access to the lower cost GMB held stocks whereas the small scale milling sector did not have access to the GMB supplies, forcing them to source higher priced grain from the market. After the food riots in 1998, the large-scale millers were again given an unfair advantage as the GMB retailed maize grain at lower prices to a few selected registered millers to try to limit the extent to which the millers raised roller meal prices to consumers.[11]

The inability of the GMB's pricing structure to flexibly adjust to prevailing market conditions created serious problems. Inefficiencies were created as those who could get access to the cheaper GMB supplies were able to amass benefits at the expense of the hammer millers, traders and consumers who rely on the open market for maize supplies. The system did not necessarily reward the most efficient actors in the marketing system. Maize meal prices soared as a result of these inefficiencies and the Government in 1999 reintroduced price controls on roller meal. This policy however could not be administered effectively with the bulk of maize being processed by the informal sector. Furthermore the reintroduction of subsidies on industrial roller meal in 1999 following the food riots, weakened competition in the small scale milling sector (Jayne et al, 1999; Mckay, 2001).

Rural consumers benefited more than urban consumers from decontrol when comparing the costs of roller-meal with locally processed meal (Stack, 1997). This is to be expected as the transport and transactions costs savings are greater. In addition the informal market responds more strongly to supply, giving better price signals than the formal market. The rural poor did not benefit from subsidies because of limited access and even with access, the subsidised meal was more expensive than own production. A large proportion of the subsidy went to the rich, to petfood and other leakages. In addition the nutritional benefits from wider consumption of the less refined maizemeal are important.

Liberalisation also benefited consumers indirectly through the dynamic effects of the establishment of small millers and processors which provide a focal point for the exchange of other commodities. In addition the increased competition has forced the industrial millers to become more efficient, reducing real prices but with some costs to

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[9] The hammer-milled maize contains more vitamins and nutrients, although it is often less preferred and in low-density suburbs, involves an investment of time.

[10] There are three major large scale millers, National Foods being the largest

[11] In 1998 GMB increased nominal selling prices of grain by 30% to $2900. GMB continued to pay farmers $1200 and increased the price in response to the imports needed to increase stocks.

formal sector employment. This was offset by those employed in the small milling sector, although at lower wages.

Impact on the Fiscus and the Role of Government in Agricultural Marketing

The drought of 1991/92 eliminated the plan to reduce agricultural subsidies. As the worst drought in written record, it came after almost a decade of below average rainfall so that both the surface and underground water supplies were also low and most families did not have any stocks of food . The Government responded and introduced a large supplementary feeding programme. Another drought in 94/95 also affected the subsidy position. In general, subsidies to agricultural parastatals were reduced significantly in the 1990s with all the losses (except the drought related GMB losses) significantly reduced and some of the commercialised parastatals making profits.

The state is expected to ensure constant access, at reasonable prices, to the basic staple, maize and has invested in infrastructure and physical and financial strategic reserves in most years. However, financial constraints contributed to the low producer prices in 1997 and the inability to use the surplus to replenish buffer stocks. This in turn contributed to the 1998 food riots and the reintroduction of limited subsidies. The escalation of the GMB debt to Z$10 billion resulted in pressures to hold down producer prices. Institutional factors further reduced maize supply in 2000 and 2001 and resulted in a severe food deficit in early 2002.

The GMB was not effective in fulfilling its social roles because of inadequate or late financing and was not able to compete with the private sector for access to maize supplies, particularly in deficit years. All domestic maize trading was banned in late 2001. All maize grain could be sold only to the GMB. This applied to even one-bucket traders in small town markets and individuals on buses being forced to sell all grain to the GMB. The GMB is servicing only selected millers threatening the survival of the urban and rural food processors, leaving them to source grain illegally and operate with no security. To the extent that these regulations are unenforcible in the more remote areas it may encourage increased investment in rural hammer-mills particularly if maize meal sales remain unsubsidised and uncontrolled.

Early in 2002 the holding of all grain stocks by farmers were banned and grain supplies siezed leaving the livestock industry and farm workers facing disaster. Even some smallholder farmers have had grain stocks seized. All existing grain contracts were cancelled and the dislocation will affect downstream industries.

Cotton Marketing

Prior to reform, the price of cotton was established by government on the basis that the local textile industry [12] had all their needs met at a predetermined price that was normally significantly below prices which would have been obtained from exporting cotton lint. At the beginning of the decade, cotton seed was also sold below export parity to the local oil processing industry. Not only did these pricing policies affect growth by reallocating resources away from cotton, in which there was a clear comparative

[12] The textile industry was dominated by two companies - David Whitehead and Cone Textiles.

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advantage in most years, but it was regressive. Smallholders accounted for over 50% of total cotton production in most years and they were effectively subsidising industrialists.

The Cotton Marketing Board (CMB) was granted formal managerial autonomy in 1991. In the period 1993 to 1994 the CMB's statutory monopoly in purchasing, ginning, marketing and exporting of cotton was removed. The Cotton Company of Zimbabwe (Cottco) was launched in 1994 to replace CMB. Cottco was privatised in October 1997 and was listed on the Zimbabwe Stock Exchange where it has been very successful.

Once the cotton sector was opened up to competition new competitors began entering the market from the period 1995/96. Cargill a United States based multinational entered the market and introduced the cash payment system. This system was welcomed by smallholder farmers because they now received instant cash payments at the ginnery gate or depot as opposed to the CMB system where producers received a cheque payment two to four weeks after delivery of the cotton. The Cotton Producers Association (Cotpro) Limited, a cooperative representing large scale commercial cotton producers was the other major competitor to enter the market. A few other small Zimbabwean traders also entered the market as mobile buyers.

The three major companies organised their own buying posts and collection points staffed with their own employees such that they do not rely on commissioned agents or independent buyers. The competition between the three companies also led them to supply credit and inputs were linked to tied sales.

Before the reform of the cotton sector, producer prices of cotton were 58% of the international price from 1990 to 1993. Following the decision to open up the cotton sector to greater competition, the ratio of domestic to international prices of cotton rose by more than one-third. For the period 1994 to1997 the ratio of domestic to international prices was 79% (World Bank, 1999). Following the reforms in the cotton sector, production increased and farmers have been receiving between 80% and 90% of world prices. The emergence of private traders, exporters and ginners gave new dynamism to the rural sector (World Bank, 2000).

A review of the seed cotton prices from 1994 to 1999 shows that Cotpro and Cottco offered similar prices with Cottco acting as the price leader. Cottco and Cotpro adopted price-setting policies based on the seasonal pool pricing system[13] whereby farmers actually receive payments twice a year. Cotpro and Cargill wait for Cottco to make its final settlement with the farmers. Cottco continues to play the role of price leader in the market thus limiting effective competition in the industry. Table 4 below shows the price indices for seed cotton after cotton trade was liberalised.

Table 4 - Grade A Cotton Prices

Cotpro Limited was taken over by Cottco in the year 2000 due to financial difficulties. By the year 2005 Cotpro Limited will be wholly owned by Cottco. Cottco accounted for 80-85% of the market in the year 2000 and maintains monopoly power.

[13] The seasonal pool pricing system is an option whereby farmers are paid an interim price on delivery of their cotton and at the end of the season an adjustment is made. This provides farmers with the opportunity to benefit from international price movements but incurs more risk.

Dairy Marketing

The Dairy Marketing Board (DMB) was commercialised in 1993 and then fully privatised, as Dairibord Zimbabwe Limited (DZL) in 1996. The government removed price controls and allowed the entry of private companies and cooperatives into the milk industry, such as Quality Dairies in Marondera, Masvingo Co-op, Kershelmar Dairies in Bulawayo and multinational companies like Nestle Zimbabwe (Pvt) Ltd into the milk markets. Some price and non-price competition and a wider range of dairy products resulted. Barriers to entry were high and were particularly formidable for small dairies which were severely hampered by strict health regulations and the high cost of the sophisticated processing and storage equipment required.

The DMB responded to commercialisation by reducing staff, leasing commercially unviable depots in urban and rural areas, privatising the milk roundsmen service, upgrading the transport fleet, tightening budget controls and increasing milk prices. The significant losses were transformed into profits within a year. This was the result of the increased efficiencies but also increased consumer prices for these relatively price inelastic commodities, and limited competition. Because of droughts in the early 1990s and the rising costs of stock feeds, farmers reduced milk production, despite increased producer prices.

In 2000 the DZL purchased 85% of the national milk deliveries, Nestle 8.5% and the remaining share from a few small processors. The rural dairy industry has not been able to attract many entrants due to the poor viability of smallholder dairying (Hanyani-Mlambo et al, 1998; Makamure et al, 2001).

Marketing of other commodities

Beef marketing on the domestic market is open and private abattoirs operate provided they are licenced, inspected and conform to hygiene standards and regulations. The liberalisation of the beef industry from 1991 has induced a proliferation of private slaughterhouses of which 54 are registered private abattoirs (Makamure et al, 2001). The Cold Storage Commission (now the Cold Storage Company) has experienced declining throughput. In 1990 CSC contributed 52% of the total cattle slaughter but this declined to 22% by 1999. Activities by registered and unregistered abattoirs have increased over the same period. The CSC has a monopoly on international beef markets although licenses are granted to meat processors to export. Exports to Europe under the Lome Convention contribute significantly to the value of the beef industry and disruptions to the flow of exports[14]reduced CSC profitability and resulted in potential foreclosure of some if not all its operations.

The tobacco industry has been largely free from interventions and prices reflect world price trends less the export tax. All tobacco must be sold on the licensed auction floors and no private arrangements can be made. At the auction floors local and international tobacco buying companies bid for each bale of tobacco sold. TIMB[15] is the

[14] Operational inefficiencies relating to unacceptable packaging, foot and mouth and political factors restricted exports in 2001.

[15] In 1994, the Tobacco Marketing Board was reconstituted to cater for the interests of all classes of different types of tobacco growers and buyers and indigenous buyers competed with traditional buyers for the first time. In 1997 The Tobacco Marketing and Levy

government body regulating tobacco marketing in Zimbabwe. The Tobacco Sales Floor (TSF)[16] and Burley Marketing Zimbabwe have dominated the industry for years. Boka Tobacco Auction Floors opened in 1998 to provide some competition for TSF on flue-cured tobacco but closed in 1999. The Zimbabwe Industry Tobacco Auction Centre (formerly Boka Tobacco Auction Floors) entered the market in 2001 with a mandated equal share in all tobacco sales. International marketing of tobacco leaf is conducted by multinationals. There was concern that these companies collude to form buying cartels thus creating distortions in transmitting the world price to farmers. There was a significant drop in tobacco planted in 2001 and continued declines are expected as land reform replaces large farmers and the overvalued exchange rate reduces profitability of tobacco for smallholders. The real net protection was estimated at –80% using the black market rate, and –66% using the estimated real exchange rate, in June 2002. This was after taking into account the subsidy being paid to farmers to reduce the impact of overvaluation.

The horticultural industry has limited government control and regulation. Export market and safety regulations are in place and a number of farmer marketing co-operatives are active in supplying international markets. Horticultural exports are dominated by the capital-intensive, large scale-sector although there has been a small increase in outgrower schemes incorporating smallholder farmers. On the domestic market, farmers sell their crop through direct supply to wholesalers, retail outlets, open markets and hawkers. The local market is supplied by both the seconds from exporters and many small rural producers. The prices on the domestic market are largely determined by supply and demand with the urban centres being the reference point for prices. Poor access to market information reduces efficiency, particularly for smallholders. They are also more affected by overvaluation since they may not have the information or the necessary social capital to arrange favorable exchange rates in a situation where the official exchange rate is so heavily overvalued.[17]

Large-scale farmers are directly involved in marketing soyabeans, coffee, groundnuts, paprika, ostriches and other products either to local processing or trading companies, or directly on the international market. Some of these commodities have strict regulations and marketing restrictions in order to maintain standards and promote the industry. However, these restrictions can also act as barriers to competition and some investigation of the costs and benefits of these systems should be made. Smallholders market through traders and neighbouring large farmers but unless they form marketing syndicates, which can bulk produce, they remain at a disadvantage with their low levels of output, poor infrastructure and limited access to information.

Marketing through the Zimbabwe Agricultural Commodity Exchange (ZIMACE)

An important private sector response to the deregulation of agricultural markets was the emergence of the Zimbabwe Agricultural Commodity Exchange. ZIMACE was

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(Amendment) Act, 1997 changed the structure of the board and a new name the Tobacco Industry and Marketing Board (TIMB)

[16] From 1983 through to 1994 TSF, handled the entire Zimbabwe flue-cured crop.

[17] The official exchange rate was Z$55:US$1; the black market rate Z$500:US$1 and the estimated real exchange rate Z$300:US$1, June 2002

set up in 1994 to provide a mechanism for price discovery and coordination of the exchange of agricultural commodities. Zimbabwe was one of the first countries in Africa to have a commodity exchange. ZIMACE started as a holding company with a single broker providing a market for products, but it expanded over the years to include buyers and end users. ZIMACE facilitated the trade of any commodity provided or desired by any consenting parties except for tea, tobacco and horticultural produce. It was an exchange mechanism where buyers and sellers could interact, enabling the articulation of supply and demand conditions. Spot and forward sale took place on the exchange. The ZIMACE provided a potentially important means for farmers, traders and millers to manage price risks and reduce the transactions costs of identifying potential buyers and/or sellers.

The volumes of commodities traded at ZIMACE increased by an average of 35% a year between 1994 and 1999 as farmers took advantage of the partially liberalised agricultural marketing system. In 1995/96 and 1996/97, ZIMACE traded 50 000 tonnes of maize accounting for about 4-6% of the national marketed maize supply from domestic production. During the 1997/98 agricultural marketing year, a total of 224 531 tonnes of agricultural commodities were traded through the exchange compared with 107 000 tonnes in 1996/1997. Some Z$759 million (real terms) were traded through ZIMACE during the period April to January 1999 compared to Z$267 million for the same period in 1998. (The ZIMACE Trader, 1998; Muchopa, 1999; Jayne et al, 1999).

The ZIMACE was mainly utilised by large scale commercial farmers and industrial buyers. Membership in ZIMACE consisted of conglomerates like Delta, Olivine Industries; large scale commercial farmers, large millers. There were a total of 17 brokers on ZIMACE, the Commercial Farmers Union (CFU) being one. Only registered ZIMACE members or their employees were allowed to trade through the exchange. Of the members, 75% are broking members and 25% are non-broking members.[18] ZIMACE prices were used as reference prices in negotiating forward contracts with farmers and larger traders at the ZIMACE and by traders and farmers negotiating sales outside ZIMACE. Its greatest contribution to agricultural marketing in Zimbabwe was to act as a completely transparent instrument of price discovery for agricultural producers. A significant development was that smallholders were basing the prices of their commodities on ZIMACE prices putting them in a better bargaining position as they seek markets for their produce (Muchopa, 1999).

In July 2001 a statutory instrument (235A of 2001) was introduced declaring maize, maize products, wheat and wheat products to be controlled products within Zimbabwe. This made it illegal to buy, sell or move these products within Zimbabwe other than to the Grain Marketing Board. In light of these developments, trade at the ZIMACE was officially suspended (ZIMACE, 2001).

CONCLUSIONS

[18] Broking members exclusively deal on ZIMACE whilst non-broking members can buy and sell elsewhere other than the ZIMACE. However, non-broking members cannot make contacts directly through ZIMACE, they have to find a broking member who makes a contract for them.

The state controlled agricultural marketing system played an important role in commercialising the production of major commodities. However the system discriminated against smallholders in the settler era. The expansion of this system to smallholders after independence created serious fiscal burdens and reduced rural industrialisation but it had a postive impact on surplus smallholders in remote regions. In general, however, the price and marketing policies impacted negatively on both growth and equity.

The liberalisation of the market system in the 1990s had positive effects for most producers, rural traders and urban consumers and played a role in reducing parastatal debt. However, some of the privatised boards retain effective monopolies which limit the benefits to producers and consumers. There is still much which could be done to overcome the constraints to agricultural marketing:

- encourage rural development expand local markets and opportunities for traders
- improve growth through reduced marketing margins, reduced barriers to entry and increased competition, improve infrastructure and communication
- improve equity (and reduce price instability) by ensuring the ability of the GMB to fulfil its role as buyer and seller of last resort; and
- improve national food security by establishing secure financial and stock reserves for basic staples.

The state marketing monopolies were disbanded as a result of the structural adjustment programme but they have been converted into private monopolies and the state needs to foster competition and remove barriers to entry. The liberalisation of the grain market had strong, positive effects in the smallholder sector increasing both static and dynamic efficiency and contributing to rural industrialisation. The state needs to play a much more active role in improving infrastructure, making information widely accessible and encouraging more traders and processors to operate in the rural areas. Access to finance, foreign currency and processing and transport inputs is necessary, if small processors and traders are to be encouraged. There has been an increase in Chinese and Indian imports of equipment appropriate to small processors, and these efforts need to be encouraged by access to foreign currency and low tariffs. The overvalued exchange rate is a serious disruption to development.

The role of the GMB in providing floor and ceiling prices could reduce the risks faced by poor farmers and poor consumers but for it to be effective, it needs to sell stocks early when there are shortages and buy stocks early in good years. In the long run it may be more effective to encourage localised storage and exchange systems to achieve rural food security and ensure that the multiplier effects of maize processing and trading remain in the rural areas.

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Table 2 – Zimbabwe: Real Producer Prices 1985/86 – 1990/91 at constant 2000 prices[1]

Year	85/86	86/87	87/88	88/89	89/90	90/91	91/92
White Maize ($/tonne)	5106	3877	3620	3515	3388	2871	2424
Soyabeans ($/tonne)	9078	7322	7744	7571	6855	6189	5028
Sunflower seed ($/tonne)	9078	7322	7844	7751	7170	6444	5208
S/Groundnuts ($/tonne)	21276	16152	18102	18025	15758	15951	11224
Wheat ($/tonne)	8085	6461	6638	6579	6303	5870	4669
Seed Cotton (c/kg)	1901	1615	1609	1532	1466	1493	1266
Beef (c/kg)	4340	3877	4747	4524	4302	3879	3313
Dairy (c/l)	1160	877	821	824	797	671	575
Tobacco (flue-cured) c/kg[3]	8902	4693	7914	7746	10220	14768	7276

1. Deflated by CPI (2000=100) from CSO (2001), prices are based of official sources i.e. GMB, CottCo, DZL floor prices or ZIMACE bid/offer price.
Sources: AFC (1998); 2. CFU indicative prices 3. MLARR (2000)

Table 3 - Real Producer Prices of Various Agricultural Commodities 1990/91 - 1999/00 at constant 2000 prices[1]

Year	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99	99/00[2]
White Maize ($/tonne)	2871	2424	3872	5179	4226	4642	3905	5188	3741	4600
Soyabeans ($/tonne)	6189	5028	6688	8632	7044	10444	9828	9140	8105	8300
Sunflower seed ($/tonne)	6444	5208	7005	8471	6913	7736	6509	3582	5923	7000
S/Groundnuts ($/tonne)	15951	11224	10561	10359	11270	23209	20177	15316	10131	13500
Wheat ($/tonne)	5870	4669	7005	8345	6809	10444	8299	6299	5923	6835
Seed Cotton (c/kg)	1493	1266	2119	1842	1738	1625	1953	2594	1637	1400
Beef (c/kg)	3879	3313	2598	2653		6189	6642	6052	4364	4500
Dairy (c/l)	671	575	507	622		743	775	716	770	780
Tobacco (flue-cured) c/kg[3]	14768	7276	5651	7944	8470	11222	9440	8582	10323	

1. Deflated by CPI (2000=100) from CSO (2001), prices are based on official sources i.e. GMB, CottCo, DZL floor prices or ZIMACE bid/offer price.
Sources: AFC (1998); 2. CFU indicative prices 3. MLARR (2000)

Table 4 : Grade A Cotton Prices - Z$/kg seed cotton

COMPANY	*Cottco*	*Cotpro*	*Cargill*
1994	3.89	Unavailable	Not yet in operation
1995	4.30	4.83	5.00
1996	5.81	6.25	5.70
1997	6.00	6.32	6.00
1998	9.37	9.35	8.02
1999	14.50	14.75	15.00

Sources: Larsen, 2001; Cotton Growers Association

Appendix Eight

ANALYSIS OF A FARMER'S CONTRACTUAL CHOICE USING A NON-LINEAR PROGRAMMING APPROACH.

Tirivafi Shuro Lovemore M. Rugube and Reneth Mano

1. Introduction

Large-scale commercial farmers have dominated soyabean production in Zimbabwe since the 1940's. A project funded by the Rockefeller Foundation and co-ordinated by the Soyabean Promotion Task Force (SPTF) has shown that soyabean can be successfully cultivated in the smallholder farming sector of Zimbabwe. Phenomenal increases in numbers of participating farmers have been reported in the project areas of Hurungwe, Guruve, Wedza and Chikomba districts. In Hwedza alone for example, about 2 000 smallholder farmers have adopted soyabean production since the project began four years ago (Rusike et al 2000). Disposal of the crop to the market became a problem that prompted the SPTF to assist farmers in marketing so that adoption potential is not thwarted. The SPTF has concentrated on addressing production constraints and has to a limited extent, assisted farmers with marketing arrangements. If a market structure capable of supporting a more advanced production system is not forthcoming, technological gains in production maybe restricted. Availability and accessibility of markets for soyabean should become the major driving force behind soyabean production expansion. As observed by Rusike et al (2000), lack of sustainable and rewarding produce marketing arrangements has become a major constraint to adoption of soyabean production.

This paper will set up the non-linear programming model and describe the data used in the model components. Results from running the model are then analysed before a summary of the key findings closes the chapter.

2. Problem Statement

Soyabean production in the smallholder sector (for example, areas like Buhera, Wedza Hurungwe) has been expanding since 1996 due to the establishment of a soyabean promotion task force (SPTF). Most smallholder farmers have shown interest in producing soyabean. Though soyabean production has been on the increase, growth has been limited by farmers' failure to profitably sell their soyabean on the market. The Task Force then made an arrangement to assist farmers on marketing the produce. The expansion rate of the soyabean adoption has gone beyond that of the task force's resource capacity, challenging the sustainability of this type of arrangement. The economic performance and resource capacity of the marketing arrangements created by the Soyabean Promotion Task Force have also been questioned considering its dependency on donor funding.

Farmer groups in Buhera and Wedza communal areas have expressed concern over the sustainability of soyabean production, citing their biggest problem as the low returns to marketing their produce through such marketing outlets as the Grain Marketing Board, private traders and other informal market outlets (Rusike et al, 2000). Farmers in these areas are more concerned with how to move their produce from their farms to the final

market place and how to identify viable markets for their crop sales. Lack of economically efficient and sustainable marketing arrangements to deliver this service has been a major problem.

If the farmer does not realise any tangible profits or benefits from producing this crop, then all the effort that has been put to promote its production is of little value because the objective of promoting adoption of the crop would be frustrated. Soyabean farmers are facing problems in procuring inputs and marketing their produce and these problems are emanating from the institutional and organisational set-up in the marketing relationship they have with their vertical chain partners. The input delivery system in the country is not well developed. Suppliers are mainly concentrated in the urban centres, leaving the distribution function to private traders who charge high prices at the rural stores. High transport costs have raised transaction costs, for both the input and the output markets.

3. Justification of the Study

To protect farmers from high marketing costs and exploitative producer prices, the Soyabean Task Force has been helping farmers by securing lucrative marketing deals and securing and delivering inputs to farmers at the lowest possible cost. This observation has led to many questions about the sustainability of such an arrangement for providing marketing services to soyabean farmers. Several models or arrangements have been tried and many are in use in agricultural commodity marketing in Zimbabwe. The private sector as well as government are at cross-roads in the choice of the best models for agro-industrial development, i.e. what kind of institutional and organisational arrangements/models are appropriate for overcoming current constraints and maximising their contribution to rural and smallholder farmer development? From a practical perspective, there is no generic implementation strategy that can be considered appropriate to all supply chain situations. The best strategy depends on contextual factors involving the end market of the commodity, individual agro-processing organisations and the infrastructure and institutions that support farmers' activities.

4. Objectives of the Study

To find out the nature of the model farmers would choose in order to maximise net income given land, labour and budget constraints.

5. Study Hypotheses

The researcher hypothesised that:

Smallholder soyabean farmers faced with an array of different contractual marketing arrangements are likely to choose those arrangements that minimise transaction costs, assuming certainty in contractual performance on both parties.

6. Literature Review

6.1. Contractual Based Marketing Arrangements

Contractual based arrangements are usually practiced by food processing firms that need a steady level of raw material inflows necessary to suffice plant capacity at a predetermined price (Glover and Kusterer, 1990). A contractual arrangement made between the farmers and the industry raises the certainty of quantity, quality and dates of delivery. The processors provide an assured market outlet and access to critical productive resources such as credit, technical and related assistance and sometimes crop collection facilities. Examples in Zimbabwe include the cotton scheme by the Cotton Company of Zimbabwe (Cottco), sorghum scheme by Chibuku Breweries, groundnut scheme by Reapers Pvt Ltd. In these schemes, producers (farmers) undertake production of specified crop varieties, adhere to delivery date quotas and agree to market products according to grading standards, pricing and credit recovery arrangements stipulated in a contract agreement.

Glover and Kusterer go further to acknowledge that contracting is fundamentally a way of allocating the distribution of risk between the agro-firm and growers. The former assuming risks of marketing the final product while the latter assumes risks associated with production. The most important thing to be considered is the precondition required in setting up the contract. The partners would be specifying how much risk and what kind of risk they should bear. The balance of parties bargaining power will determine an equal distribution of benefits received by each individual party. The best strategy will depend on contextual factors involving the end market of the commodity, individual agro-processing organisations and the infrastructure and institutions that support farmers' activities (Nicholas, 2001).

So far several potential problems that can come out of this kind of arrangement (if it is not properly executed) have been identified. These problems are:

i) Predominance of the nucleus (contracting agro-firm) over the plasma (farmers) that would lead a system to a cartel structure of production.
ii) A fatal outcome maybe coming up following break–down of co-operation between the two contracting parties.
iii) Since parties are interdependently related, a distortion at the production sector may cause a serious disturbance in the whole production activities at the processing system and vise versa.
iv) Fairness and string commitment to the 'rule of the game' as assigned at the contract is a necessary precondition to run the system, otherwise the whole system will be broken down.

Traditional microeconomic theory holds that the basic co-ordinating mechanism between firms in a supply chain is the market. But, as Coase (1937), points out, while market transactions are common outside the firm as a means of directing production, inside the firm the task of directing or co-ordinating production is in the hands of the owner/manager. This observation raises the question: which activities should be left to the co-ordinating influence of the market and which should be assumed within the firm to be controlled by management or within the household to be controlled by the farmer? Williamson (1971) built on this theme and identified the importance of 'transactional failures' as the driving force behind vertical integration and/or the substitution of market transactions by contracts. Transaction cost economics as described by Coase and

developed by Williamson provides a solid theoretical base for the existence of a firm and for establishing the boundaries of its activities.

6.2. The Transaction Costs Concept

Coase introduced the concept of transaction costs when he suggested that the use of the market involve extra costs, such as cost of information search, bargaining and signing contracts. Transaction costs are difficult to define and once defined, difficult to observe and quantify but three broad definitions are more pronounced in literature.

Arrow (1970) defines transaction costs as the costs of running the economic system i.e. the cost of doing business and that of the friction in the economic system. He contrasts the with transformation costs (cost of production and processing)

According to North (1990), transaction costs are the fundamental cost on transactions. These costs may include the cost of establishing contact and relations with other parties, cost of screening (both commodity and party) cost of negotiation, cost of exchanging rights to the commodity being transacted, cost of monitoring and enforcing the contract. Such costs arise as a result of incomplete and asymmetrical information and are an attempt to reduce risks that are endogenous to transactions.

Hobbs (1996), classified transaction costs under three major headings:

i) Information costs - the discovery of potential suppliers/buyers and price levels.
ii) Negotiation costs - all aspects of the sale including time, the employment of specialists and the terms of sale.
iii) Monitoring costs - activities, which occur after the sale has been negotiated, such as monitoring the behaviour of the other party, checking deliveries against specifications and enforcement costs.

Improvement of efficiency emphasises minimisation of the transactions costs associated with interactions between firms. According to Coase, a firm will internalise activities (vertically integrate) up to the point where the internal transaction costs associated with these activities equals the costs of using the open market. Transaction costs research sparked renewed interest in the relationships that exist between firms.

The transaction-cost approach, as for the majority of economic theory, has its deepest roots in the famous work of Adam Smith (1776) and the notion that economic exchange is best transacted in the market. The market is the default forum for exchange in the transaction-cost approach, with deviations from the market occurring only where the market has failed to provide the most efficient (least cost) solution. In reality many alternative forms of economic exchange are clearly apparent. The first person to formally propose that such alternative forms (firms) were the result of economising on costs was Coase (1937). Coase proposed that market exchanges carried with them costs associated with determining the terms of trade that would be avoided by transacting within a single authority structure. Commons (1925 and 1934) also proposed the idea that the transaction was the basic unit of economic analysis about the same time. Williamson (1985 and

1991) combined transaction-cost theory with discrete structural analysis in which organisational forms are studied in comparison to alternatives. He defines transaction cost analysis as an examination of the transaction costs of planning, adapting and monitoring task completion under alternative governance structures. He states that if economies of scope and scale are held constant then the choice of transaction arrangement turns entirely on governance costs. Governance costs implying the inclusion of all costs that differ between contractual forms.

6.3. The Governance Costs Concept

Williamson (1991) characterises different types of contractual forms ranging from spot market through bilateral contracts to vertical integration as market, hybrid and hierarchy forms of governance. The governance structures vary with the intensity of each marketing arrangement. Each of these forms of governance is associated with different co-ordination and control mechanisms, different types of contract law, different disturbance and adaptation mechanisms, and hence different appropriateness to transaction with different characteristics. Williamson (in Dorward, 1999) goes on to state that if economies of scale and scope are held constant, the choice on contractual forms turns entirely on governance costs, implying the inclusion of all costs that vary between contractual forms. The contractual form with the lowest governance costs (or with the highest 'transaction margin' of revenue over governance costs, providing for pure transaction costs and profit) will be preferred. This study borrows from this background and takes governance costs as the totality of costs incurred in settling a transaction in a particular contractual arrangement but varying across different arrangements.

Farmers, like any firm, enter strategic partnerships because they believe that they will be 'better off' by working more closely with selected members of their supply chains. The expectations of these mutual benefits are determined in the exploration stage of the relationship development model as identified by Dwyer et al. (1987). It is during this stage that Wilson (1995) claims that the success or failure of a relationship is determined as partners align their mutual goals and define the boundaries of their relationship. These two key processes initiate trust and determine the resources available to create value in the relationship.

The journey from an open market, adversarial type relationship to one that involves closer collaboration with a partner requires increasing amounts of trust, commitment and relationship management (Dunne, 2001). However, empirical studies in the US (Spekman et al 1998), Australia (Schroder and Mavondo, 1998) and South Africa (Morris et al. 1998) suggest that:

i) close business-to-business relationships are not appropriate for all trading situations,
ii) business-to-business relationships in practice are more than simple customer retention programs but less than full-fledged collaborative partnerships, and
iii) business-to-business relationships are more valued by sellers than buyers.

Contract farming or smallholder outgrower schemes have their disadvantages if not properly executed. The major one being that benefits have been skewed to the contracting firm. In some cases these arrangements have led to a shift to more cash crops at the

expense of food crops. These problems have expressed themselves in Zambia and of late are evident in Zimbabwe.

In spite of this 'go-slow' approach to more involved co-operation between businesses, Morris et al. (1998) think that it is reasonable to conclude that relationships are now a fixture in industrial markets. Furthermore, the literature suggests that an extension of dyadic business-to-business relationships to the whole supply chain is a prerequisite for firms wishing to compete in global markets.

6.4. Review of Analytical Methods

Contractual and relationship analysis is a complex process concerned with effects on performance of both existing and missing institutions. The analysis is complicated because behaviour is influenced by a matrix of institutions, some formal and some informal.

Following on theoretical foundations laid by Williamson on governance costs, we conceptualise farmers behaving in a 'governance cost minimising' when choosing among contract governance structures. The contractual arrangement with lowest governance costs among alternatives with equal governance revenue (or with the highest 'transaction margin' of revenue over governance costs, providing for pure transformation costs and profit) would be preferred. This measure of performance is more encompassing than the use of pure transaction costs described above. Governance costs also include transformation costs that vary with contractual arrangements as well as risk of loss associated with each arrangement.

Determining choice of contractual arrangement(s) that would work best for smallholder soyabean producers given their economic environment/resource endowments is an optimisation problem. This problem would require an analytical tool that allows establishment of an optimal allocation of resources. Mathematical programming methods would be a natural answer. A mathematical programming set-up usually consists of an objective function, activities and limited resources. It is used to determine the best combination of activities that does not use more resources than are actually available, yet yielding the most optimal solution (Schrange, 1986). These programming methods can be divided into linear and non-linear models. The problem at hand includes components that make the relationship between activities and the objective function non-linear. Thus a non-linear programming model would be appropriate. Other studies on modelling of contractual choice in buyer-seller relationships have also used non-linear models, especially modified MOTAD models (see Dorward, 1999 and 2001).

A Non-linear Program (NLP) is a problem in which inequalities and/or the objective function are non-linear functions. It can be put into the form:

Minimise F (x)

Subject to	$g_i(x) = 0$	for I = 1,...,m1	where m1 = 0
	$h_j(x) = 0$	for j = m1+1,...,m	where m = m1

That is, there is one scalar-valued function F, of several variables (x here is a vector), that we seek to minimise subject (perhaps) to one or more other such functions that serve to limit or define the values of these variables. F is called the "objective function", while the various other functions are called the "constraints". One of the greatest challenges in NLP is that some problems exhibit "local optima"; that is, spurious solutions that merely satisfy the requirements on the derivatives of the functions. Algorithms that propose to overcome this difficulty are termed "Global Optimisation" (Schrange, 1986).

Dorward's work (Dorward, 1998; 1999; 2001) on developing a conceptual framework for quantitative analyses of the effect of transaction costs, power and risk on choice of contractual arrangements is based on non-linear programming. He modified a linear MOTAD model for risk analysis. Hypothetical data was used in these studies and the model predicted that to spread risks and minimise costs, firms may use a number of different contractual forms in buying their raw material. This is in line with the common practice of simultaneously participating in both longer term and contracts and spot markets. Probabilities of different market conditions and contractual party's behaviour, transaction costs, risk aversiveness of a contracting party, price variations and losses were found to be having an effect on choice of contractual form a firm engages in.

7. Research Methodology

7.1. Conceptual Framework to Analysing Contract Choice

Consider a smallholder farmer who wishes to maximise a utility function of net revenue (net income Y) overtime. The farmer achieves this by choosing not only the suitable (profit maximising) production method, but also selects appropriate forms of transaction arrangements he/she engages in. This study looks at the choice of preferred contractual forms in a transaction or set of transactions for marketing a commodity. Before doing that there is need to recap on the definition of transaction cost analysis and categorise the different type of costs to be analysed.

Williamson (1985) defines transaction cost analysis as an examination of the transaction costs of planning, adapting and monitoring task completion under alternative governance structures. He states that if economies of scope and scale are held constant then the choice of transaction arrangement turns entirely on governance costs. Governance costs implying the inclusion of all costs that differ between contractual forms.

Drawing from the definitions in section 6.5, the costs incurred in a transaction can be classified into four different types of costs (Williamson 1985, Dorward 1999). The cost categories are listed below and they helped in conceptualising of transaction costs, empirical data collection and analysis.

i) Pure Transformation Costs (P)

Production costs that are not affected by the choice of contractual form e.g. seed, fertiliser and other machinery costs that are not significantly affected by contact choice. Pure transaction costs are not part of governance costs.

ii) Associated Transformation Costs (F)
These are also production, processing and marketing costs. They differ from pure transformation costs in that they vary with contractual arrangements chosen.

iii) Pure Transaction Costs (TC)
North defines these as information costs of making contacts, screening, negotiation, transferring risks, contract monitoring and enforcement.

iv) Associated Risk of Loss (L)
Defined by Williamson as the different risks of loss associated with different contractual forms.

In this study we shall assume that the risk of loss does to vary across models and there is certainty in performance on the part of the buyer. Thus, associated risk maybe mentioned but it is not measured or analysed in this study. Because pure transformation costs do not necessarily vary across different contractual arrangements, they are not included in the analysis of governance costs.

7.2. Modelling Farmer' Contractual Choice

Taking a two-crop (soyabean and maize) production model for a farmer confronted with a number (k) of alternative contractual arrangements for producing and marketing soyabean. Behaviour of a farmer (producer) faced with certainty in market prices and buyer performance and a choice between contractual marketing arrangements (which differ in transaction costs and transformation costs) can be described in a non-linear programming model. The problem was set up using a non-linear programming model as follows;

Utility will be maximised by choosing the area SA to grow soyabeans under each particular contractual arrangement k to maximise

$$U = f(R, C, SA_k, F_k, TC_k)$$

Where

U	=	Utility
R	=	Gross revenue
C	=	Pure transaction costs
SA_k	=	Area put under soyabean for contractual arrangement k.

F_k = Associated transformation costs under contractual arrangement k.

TC_k = pure transaction costs under contractual arrangement k.

f = function defining the relationship between U and all variables in parenthesis (brackets)

Such that

$$\sum_k SA_k \leq \bar{A},$$

$$\sum_k SA_k \geq 0$$

and

$\bar{A}$ = Total land available for crop production.

This analysis is amenable to solution using mathematical programming methods.

7.3. Data Collection

Surveys were conducted in Buhera, Hwedza and Shamva districts. Four marketing arrangement models used by the SPTF, The Grain marketing Board (GMB), Chibuku Breweries Private Limited and The Cotton Company of Zimbabwe (Cottco) were selected for analysis.

These contractual arrangements were picked because they differ in levels on integration between farmer and agro-firm such that they represent an array of different levels of contractual relationship. The range starts from the Chibuku model where farmers are supplied with sorghum seed only, to the GMB model where farmers get seed, fertiliser and extension, then the SPTF where farmers get seed, inoculant and marketing services, up to the Cottco scheme which provide farmers with seed, fertiliser, chemicals, extension and marketing services.

For each model, the sampling frame was made up of all farmers who had produced crops under the respective arrangements in the 2000/2001 season from the selected districts. The agro-firms in each of the models provided farmer records in form of names, names of their farmer groups and their physical addresses. A one round sample survey was carried out on representative samples of farmers, focusing on registered and point data on crop production, nature of each model arrangement, benefits, incentives, marketing costs, transaction costs and problems they faced in procuring inputs and marketing the produce. 50 farmers in each model were randomly selected. Secondary data from the organisations involved in soyabean-input supply and produce marketing also augmented primary data from the surveys.

7.4. Data Analysis

A data set was created using the Statistical Package for Social Sciences (SPSS). This computer package was used for accurate and speedy processing of data for descriptive

statistics, t-tests and analysis of variance. What's Best 6.0 (WB) was used for optimising the contractual choice model. What's Best is a Microsoft Excel based computer package from LINDO. Inc. used for analysing linear and non-linear models.

A non-linear programming approach was employed to analyse contractual choice by the farmer so that recommendations are made for a better marketing arrangement model. In order to run this model, three other contractual marketing arrangements were simulated to represented three additional alternatives for soyabean marketing. They were simulated out of the normal GMB, Cottco and Chibuku contractual arrangements. A non-linear programming model that sought to analyse farmers decision on allocation of resources to be devoted to producing soyabean and the quantity to be produced for a particular contractual arrangement given the four options and constraints on labour, land, budget and credit.

7.5. The Empirical Programming Model

A farmer's objective is assumed to be that of maximising income (Y) from crop enterprises. For simplicity, two enterprises are considered; soyabean production and maize production. The farmer has to make a choice on allocation of land for growing and selling soyabean under the alternative models and/or maize for consumption, given limitations on land, labour and capital (budget). Maize enterprise is taken to represent other cropping enterprises that may compete with soyabean for limited resources. Because only one soyabean marketing model (SPTF model) has been operating, there was need come up with alternative contractual soyabean-marketing arrangements that differ in transaction costs, transformation costs and levels of service provision so that farmer choice can be analysed.

The hypothesis guiding this study postulated that smallholder soyabean farmers faced with an array of different contractual marketing arrangements are likely to choose those arrangements that minimise transaction costs, assuming certainty in contractual performance on both parties.

Following on the analysis done on three contractual grain-marketing arrangements (i.e. GMB, COTTCO and Chibuku arrangements), three simulated soyabean-marketing models were constructed. Characteristics of the GMB, Cottco and Chibuku contractual arrangements were superimposed on soyabean marketing (*mutatis mutandis* on the costs and revenues associated with soyabean production and marketing). The choice variable is the area allocated to different soyabean marketing arrangements as well as maize. Yield is assumed to be constant across all models such that the product of yield and cropping area will give the volume of soyabean a farmer can choose to grow for a particular model in order to maximise net income.

The SPTF model was renamed SM1, while the simulations of the GMB, Cottco and Chibuku models were named SM2, SM3 and SM4 respectively. The maize production enterprise is named MM. The problem was set up using a non-linear programming model as follows;

Maximise

$$Y = \sum_k SA_k * Syield\ (FCSP_k - F_k) - \sum_k TC_k * H - \sum_k SA_k\ (STVC + r_k * CR_k) + MA * Myield * FGMP - MTVC * MA \quad (1)$$

Such that

$$H = \frac{SA_k}{(SA_k + 10^{-12})} \quad (2)$$

$$\sum_k SA_k + MA \leq TA \quad (3)$$

$$\sum_k SA_k\ (Lsoya + LTF_k * Syield) + \sum_k LTC_k * H + Lmaize * MA \leq TL \quad (4)$$

$$\sum_k SA_k\ (F_k + STVC - CR_k) + \sum_k OTC_k * H + MTVC \leq TB \quad (5)$$

$$\sum_k SA_k * CR_k \leq TCR \quad (6)$$

and

$$\sum_k SA_k \geq 0 \quad (7)$$

$$MA \geq 0 \quad (8)$$

Where;

Y	=	Net income from crop production
SA_k	=	Area put under soyabean for contractual arrangement k in hectares.
$FSCP_k$	=	Factory gate price of soyabean per tonne in contractual arrangement k.
F_k	=	Associated transformation costs per tonne of soyabean under contractual arrangement k.
TC_k	=	Pure transaction costs under contractual arrangement k.
MA	=	Area put under maize in hectares.
Syield	=	Soyabean yield per hectare.
Myield	=	Maize yield per hectare
Pm	=	Farmgate price of maize per metric tonne.
STVC	=	cost of producing a tonne of soyabean
CR_k	=	Credit available for production on one hectare under contractual arrangement k.
r_k	=	Interest rate charged on credit rendered in contractual arrangement k.
MTVC	=	Cost of producing one tonne of maize
Lsoya	=	Labour required in soyabean production per hectare
Lmaize	=	Labour required in maize production per hectare
LTF_k	=	labour required in soyabean transformation process under arrangement k
LTC_k	=	labour time lost as transaction cost in arrangement k
OTC_k	=	Transaction costs incurred in cash under contractual arrangement k
TA	=	Total arable area available on the farm in hectares
TL	=	Total labour available on the farm (excluding hired labour)
TB	=	Total cash available to the farmer for crop production.
TCR	=	Total amount of credit that a farmer can get

The relationship between SA_k and TC_k prevented the use of a linear programming model. Pure transaction costs do not have a linear relationship with the volume of produce traded

or area on which soyabean is grown. For example, the cost of getting price information does not vary with the volume to be traded. The factor H serves to switch on the inclusion of transaction costs on the objective function if a farmer chooses a particular arrangement. Any positive value of SA_k will lead to the inclusion of transaction costs as they are, in the calculation of total costs.

7.5.1. Land Constraint (TA)

The average arable plot size for smallholder soyabean producers was found to be 3.6 hectares from survey data. Thus the total of all land allocated to the various models and maize production should not exceed this total land area available (Equation 3). Yield is assumed to be constant across all models. Thus land constraint also indicate the limit of how much in terms of volume a farmer can produce for the different models.

7.5.2. Labour Constraint (TL)

Household labour in the smallholder sector is limited. Different activities and enterprises including contractual arrangements compete for this labour. Farmers would favour a labour saving model or one that yields high returns to labour. The total labour taken up in each model i.e. soyabean production labour, transaction cost labour hours and maize production labour should be less than or equal to the labour that a household can offer. From the survey data, an average of five adults are available for the ten months that cover the input procurement, crop production through to marketing of soyabean. Farmers normally work five days in a week. Thus on average a total of 1200 labour days are available per household on the ten-month period.

7.5.3. Budget Constraint (TB)

The total budget available for crop enterprises was calculated by adding up all variable, transaction and transformation costs incurred in cash by the farmers on soyabean production as well as variable costs on other crops they grow. Whichever contractual arrangement a farmer chooses, the budget requirements must not exceed this total (TB on Equation 5). The survey data revealed an average of $25 421.61 as the total budget available.

7.5.4. Credit Constraint (TCR)

Although the contracting organisations in all the four models analysed said there was no limit to the credit available to an individual farmer, survey results showed that they have not supported a smallholder farmer on more than two hectares. Based on this revelation, a maximum of $8 000.00 calculated using the highest level of credit per hectare ($4 000.00) would be available as credit to each farmer. The maximum credit a smallholder soyabean farmer can get would be enough to cover 2 hectares.

7.6. Data set for the Non-Linear Programming Model

Data for this analysis came from the household surveys, interviews with the contracting agro-firms and other secondary data sources. SPTF contractual arrangement was taken as it is. Simulation of the other three models was done by applying the key characteristics of the models as presented in Table 7.1 on smallholder soyabean enterprise.

Table 7.1. Contribution Provided By Organisation Working With Farmer

Contribution		Percent in a Model			
		SPTF	GMB	Cottco	Chibuku
Credit	Seed	✓	✓	✓	✓
	Fertiliser		✓	✓	
	Chemicals/pesticides			✓	
	Transport for inputs	✓			
	Empty bags	✓	✓	✓	✓
Market		✓	✓	✓	✓
Training and extension		✓	✓	✓	✓
Transport arrangements		✓			✓

Source: survey data

Table 7.1 shows the assistance offered by the buying agro-firm. In all the models, farmers are provided with seed on credit payable upon delivery of the produce. They were also supplied with empty bags for which they were charged a fee for the use of the bags. GMB and Cottco models also provided fertiliser on credit. All the contracting agro-firms provided training and extension services to farmers. Table 7.2 shows the data set from the four contractual arrangements facing the farmer.

An average soyabean yield of 1.02mt/ha obtained from the survey on farmers in the SPTF contractual arrangement was used in the optimisation model across all the four models. A soyabean factory gate price (FCSP) of $16 000.00 per metric tonne, paid by Olivine Industries was used. This company has always bought soyabean from the SPTF farmers at competitive prices. Variations to this price were made on the SM2 (GMB) and SM3 (Cottco) models to reflect delays by these firms in paying farmers after produce delivery. The SM2 (GMB) model on average, paid farmers four months after they had delivered. Using an interest rate of 9 % (paid on the savings accounts in commercial banks), the soyabean price was discounted to $15 520.00 per mt. The same applied to SM3 (Cottco) model, which had an average payment delay of a month such that its factory gate price fell to $15 880.00.

The gross margin analysis done in Chapter 6 showed that production costs per hectare of soyabean and maize were $5 637.80 and $5 734.54 respectively. The farm-gate price of maize was calculated by removing transport and other marketing costs from the GMB maize price.

Table 7.2. Data Set for the Non-Linear Programming Model

Data Description		Contractual Arrangement Model Data			
	Original Arrangement	SPTF	GMB	COTTCO	CHIBUKU
	Simulated Model	SM1	SM2	SM3	SM4

Syield	Average soyabean yield (mt/ha)		1.02	1.02	1.02	1.02
Myield	Average maize yield (mt/ha)		1.41	1.41	1.41	1.41
FCSP	Factory-gate Soyabean price ($/mt)		16,000.00	15,520.00	15,880.00	16,000.00
FGMP	Farmgate maize price ($/mt)		7,447.62	7,447.62	7,447.62	7,447.62
STVC	Soyabean production costs ($/ha)		5,637.80	5,637.80	5,637.80	5,637.80
MTVC	Maize production costs ($/ha)		5,734.54	5,734.54	5,734.54	5,734.54
TC_k	Soyabean pure transaction costs ($)		923.73	1,427.17	2,526.52	4,698.23
F_k	Soyabean transformation costs ($/mt)		4,021.94	2,032.00	2,526.52	4,698.23
Lsoya	Labour time for soyabean production (Labour days)		67.25	67.25	67.25	67.25
Lmaize	Labour required for maize production (Ldays)		103.58	103.58	103.58	103.58
LTC_k	Labour time for soyabean transactions (Ldays)		3.84	4.1	3.31	4.58
LTF_k	Labour required for soyabean transformation (Ldays)		3.5	5	4	5
	Cost of labour ($/ Labour day)		70.00	70.00	70.00	70.00
OTC_k	Other soyabean transaction costs ($)		654.93	1,140.17	1,458.66	4,652.68
	Other soyabean transformation costs ($/mt)		3,696.65	1,641.43	2,196.08	4,254.44
CR_k	Value of credit rendered ($/ha)		2,500.00	3,000.00	4,000.00	2,000.00
r_k	Interest charges on credit (percent per annum)		0.00	0.20	0.00	0.04
TA	Land constraint	3.6 ha				
TL	Labour constraint	1 200 L days				
TB	Budget constraint	$25 421.61				
TCR	Total credit	$8 000.00				

Pure transaction and transformation costs inherent in the original GMB, Cottco and Chibuku models were assumed in the SM2, SM3 and SM4 simulated models respectively. These pure transaction costs on soyabean contractual arrangements constituted the value of labour time lost in transaction arrangement and other monetary losses due to the institutional arrangement. The labour components of these costs (transaction and transformation) were valued on average labour hours spent and the value of that labour before being added to other monetary costs incurred in ensuring a smooth flow of each transaction.

Associated transformation costs were also divided into labour costs and other monetary costs. The separation was meant to capture labour time lost as transaction and transformation costs. Labour days required for these functions, including that required for soyabean production came from the survey data. The average cost of labour per day in the surveyed area was $70.00.

The amount of credit provided in each model was calculated based on the inputs provided for crop production per hectare. The SPTF provided seed and an inoculant (rhizobium) pack valued at $2 500.00. The GMB (SM2) provided seed and fertiliser. Cottco (SM3) supplied seed, fertiliser and chemicals valued at $4 000.00 whereas Chibuku (SM4) provided seed valued at $2 000.00 to farmers per hectare.

The SPTF and Cottco did not charge interest on the credit rendered to the farmers if they repay in the first season. The GMB put a 20 percent interest while Chibuku added a 4 percent interest on the all inputs gives to farmers on credit.

8. Results of the Non-Linear Programming Model

The non-linear programming model was run using What's Best 6.0, a Microsoft Excel based optimisation software. The results from this model are presented on Table 7.2.

The results show that for a farmer to maximise net income from crop enterprises, given a choice of four marketing models similar to the SPTF, GMB, Cottco and Chibuku models he/she would produce for the SPTF, GMB and Cottco type contractual arrangements. The largest cropping area (1.29 ha) would be put under soyabean for the Cottco type arrangement. The GMB type follows with 0.78 ha and the task force model This is a reflection of the net transaction margin of revenue over governance costs realised by farmers in each model given land, labour, budget and credit constraints.

It is interesting to note that 1.24ha have been reserved for maize production. Although maize may not be the highest returning cropping option, a farmer grows this maize in order to utilise the extra resources that remains after exhausting the credit available for soyabean production.

Chibuku is not allocated any piece of land but the model results show that some costs were incurred in cash and 4.58 labour days were used. These costs indicate that the farmers incur transaction and other costs in trying to get a contractual arrangement but decide not to produce under that contact.

Table 7.2. Results of the Non-Linear Programming Model

Original Arrangement	SPTF	GMB	COTTCO	CHIBUKU			
Simulated Model	SM1	SM2	SM3	SM4			
Area put on Soyabean (ha)	**0.20**	**0.78**	**1.29**	**0.00**	Net Income		
Average soyabean yield (mt/ha)	1.02	1.02	1.02	1.02	**14,388.91**		14,568.75
Factory-gate Soyabean price ($/mt)	16,000.00	15,520.00	15,880.00	16,000.00			Dual
Soyabean production costs ($/ha)	5,637.80	5,637.80	5,637.80	5,637.80			179.66
Soyabean pure transaction costs ($)	923.73	1,427.17	1,690.36	4,973.28			
Soyabean transformation costs ($/mt)	4,021.94	2,032.00	2,526.52	4,698.23			
Labour time for soyabean production (Ldays)	67.25	67.25	67.25	67.25			
Labour time for soyabean transactions (Ldays)	3.84	4.1	3.31	4.58			
Labour time for soyabean transformation (Ldays)	3.5	5	4	5			
Other soyabean transaction costs ($)	654.93	1,140.17	1,458.66	4,652.68			
Other soyabean transformation costs ($/mt)	3,696.65	1,641.43	2,196.08	4,254.44			
Value of credit rendered ($/ha)	2,500.00	3,000.00	4,000.00	2,000.00			
Interest charges on credit (% per annum)	0.00	0.20	0.00	0.04			
Area put under maize (ha)					**1.24**		
Average maize yield (mt/ha)					1.41		
Farmgate maize price ($/mt)					7,447.62		
Maize production costs ($/ha)					5,734.54		
Labour required for maize production (Ldays)					103.58		
Cost of labour time ($/day)	70.00	70.00	70.00	70.00			
Constraints					Used		Available
Area available for crops (ha)					3.50	<=	3.60
Budget constraint ($)	2,069.99	4,767.49	6,846.79	4,652.42	25,421.61	=<=	25,421.61
Labour constraint (Ldays)	17.84	60.30	95.60	4.58	306.29	<=	1,200.00
Credit constraint ($)	494.10	2,330.29	5,175.53	0.00	7,999.92	<=	8,000.00

The entire budget was used up, almost all the land and credit available was also used up in the model. However, labour remained in excess. Only a quarter of the available labour was used up. This shows that labour is not a constraint in the selection of contractual arrangements. The budget constraint was increased by $100.00 to $25 521.61 and the model re-run to check on the marginal increment of the net income due to an increase in available cash. The result indicated as a dual value on table 7.2 shows that a farmer would get an additional $179.66 on net income should the cash available to him increase by $100.00. This result has little impact on the allocations of soyabean plots but it is expected this income would be used to increase on the production of maize. This is because all the credit that is required in soyabean production is depleted so the farmer is left with an option of increasing maize production.

From these results the hypothesis that farmers would prefer a transaction costs minimising model is rejected. The researcher concludes that; given a choice, farmers may choose a combination of contractual arrangements that maximise net income. On the four models analysed in this study, smallholder soyabean farmers are more likely to grow more soyabean under a Cottco type model than they would do under SPTF, GMB and Chibuku type models.

9. Summary

A programming approach that relates choice of utility (net income) maximising contractual arrangements to transaction costs, transformation costs, cost of labour and household resource limitations was used to evaluate farmer contractual choice. Simulations of the GMB, Cottco and Chibuku models were used as alternative models from which a soyabean farmer can choose. The aim was to find out how each of these arrangements with necessary adjustment made would have performed if they were working on soyabean. The results indicate that a farmer would optimise net income by using a combination of contractual models similar to GMB, Cottco and Chibuku models with the Cottco type model getting priority over the other three model.

10. Conclusion

Smallholder soyabean farmers faced with alternative contractual arrangements similar to Cottco, SPTF and GMB models would optimise net income by choosing a combination that yields the highest return given constraints on land, budget and credit.

11. Recommendations

Based on the results and conclusions obtained in this study, recommendations are made mainly for contracting organisations and government.

11.1. Recommendations for Contracting Organisations

Smallholder soyabean farmers should be presented with an array of marketing arrangement options varying in the level on integration, transaction costs, transformation costs or levels of service provision so that a farmer chooses a single or combination of contractual arrangements that optimise net income subject to his/her resource endowment. This calls for trading organisations like GMB or processing firms like

Olivine industries to engage soyabean farmers in contractual arrangements so as to give farmers options to choose their desired contract combinations.

A smallholder marketing arrangement should minimise contract governance costs (or maximise net governance income) for the farmer. Governance costs referring to the totality of all costs that vary with contractual model. Each contracting organisation should strive to minimise governance costs met by farmers through improved communication, closer integration and /or assisting in organising movement of inputs and produce between farmers and themselves so as to reduce both transaction and transformation costs.

11.2. Recommendation for Government

The government, through its input scheme administered by the GMB, should include soyabean in its input scheme so that farmers have another contractual option to engage for soyabean production.

12. Limitations of the study

There is a trade off on some governance costs between the seller and the buyer and by analysing only one of these, one may recommend arrangements that are not economically viable to the other party. For example, for a firm to reduce farmer transaction costs, it may need to invest heavily in information delivery or communication and this may limit producer price levels paid to the farmers. This study was focused on farmers' choice of marketing arrangements for smallholder soyabean marketing and did not look at contractual organisations' choice of purchasing arrangements.

13. Areas for Further Research

There is need for an empirical analysis of the effect of risk on choice of contractual arrangements by both the farmer and the buyer (contracting organisation).

Further research is also required on factors that affect adoption of a contractual arrangement by farmers. It is important to find out why a farmer chose to engage into a particular arrangement and why another chose not to enter into the same arrangement. This will inform 'architects' of these contractual models on how to improve their arrangements.

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Appendix Nine
COMPARATIVE ANALYSIS OF THE PERFORMANCE OF CONTRACTUAL MARKETING ARRANGEMENTS: The Case of Soyabeans in Zimbabwe

Tirivafi Shuro, Lovemore M. Rugube and Ruvimbo Mabeza-Chimedza

1. Introduction

Large-scale commercial farmers have dominated soyabean production in Zimbabwe since the 1940's. A project funded by the Rockefeller Foundation and co-ordinated by the Soyabean Promotion Task Force (SPTF) has shown that soyabean can be successfully cultivated in the smallholder farming sector of Zimbabwe. Phenomenal increases in numbers of participating farmers have been reported in the project areas of Hurungwe, Guruve, Wedza and Chikomba districts. In Hwedza alone for example, about 2 000 smallholder farmers have adopted soyabean production since the project began four years ago (Rusike et al 2000). Disposal of the crop to the market became a problem that prompted the SPTF to assist farmers in marketing so that the adoption potential is not thwarted. The SPTF has concentrated on addressing production constraints and has to a limited extent, assisted farmers with marketing arrangements. Currently, different organisations have facilitated marketing of crop produce through some marketing arrangements. These arrangements have been designed to help farmers dispose of their crop and in some cases as a means of raising production and provide assured volumes of raw materials by an agro-processing firm. It has become important to examine, compare and critically evaluate these arrangements.

2. Problem statement

Farmer groups in Buhera and Wedza communal areas have expressed concern on the sustainability of soyabean production, citing their biggest problem as the low returns to marketing their produce through such marketing outlets as the Grain Marketing Board, private traders and other informal market outlets (Rusike et al, 2000). Farmers in these areas are more concerned with how to move their produce from their farms to the final market place and how to identify viable markets for their crop sales. Lack of economically efficient and sustainable marketing arrangements to deliver this service has been a major problem. In view of this state of the soyabean market in Zimbabwe and the serious drawbacks faced by the smallholder farmers, one believes that without a helping measure, the likelihood of obtaining an economic opportunity will be very small. This is why they need a marketing arrangement that can integrate them in a unity so that they have a higher bargaining position against the larger enterprise.

3. Research Questions

i) What is the nature of the marketing and input delivery problems facing the smallholder soyabean farmers?

ii) How does the SPTF marketing approach compare with other marketing arrangements in terms of performance on the smallholder soyabean market?

4. Objectives

i) To examine problems encountered and benefits realised by farmers and contracting agricultural firms in different grain marketing arrangements in the smallholder sector.

ii) To compare the economic performance (profitability and efficiency) of the SPTF's marketing arrangement model to other grain marketing arrangements used in the smallholder agricultural commodity sector.

5. Study Hypotheses

The hypotheses of the study are as follows:

i) Soyabean farmers realise higher income from selling soyabean through the SPTF than that realised by farmers who sell their produce through other marketing arrangements.

ii) Farmers selling soyabean through the SPTF face lowest contract governance costs than those farmers who are contracted to market their crop produce through other marketing arrangements.

6. Literature Review

Contract farming ventures which promote close and stable relationships between agro-industry processors and farmers have been advanced as a potential innovative form of agricultural development. The notable success of schemes such as Kenya Tea Development Authority (KTDA), which grew to become the largest and most successful smallholder tea scheme in the world at one time, continues to attract agricultural processing industries, governments and aid agencies into exploring the potential for outgrower and contract farming projects. Jackson and Cheater (1989) indicated that the essence of these schemes involves the linking of factories and producers through production and marketing contracts.

Contractual based arrangements are usually practiced by food processing firms that need a steady level of raw material inflows necessary to suffice plant capacity at a predetermined price (Glover and Kusterer, 1990). A contractual arrangement made between the farmers and the industry raises the certainty of quantity, quality and dates of delivery. The processors provide an assured market outlet and access to critical productive resources such as credit, technical and related assistance and sometimes crop

collection facilities. Examples in Zimbabwe include the cotton scheme by Cottco, sorghum scheme by Chibuku Breweries, groundnut scheme by Reapers Pvt Ltd. In these schemes, producers (farmers) undertake production of specified crop varieties, adhere to delivery date quotas and agree to market products according to grading standards, pricing and credit recovery arrangements stipulated in the contract agreement.

6.1. The Governance Costs Concept

Williamson (1991) characterises different types of contractual forms ranging from spot market through bilateral contracts to vertical integration as market, hybrid and hierarchy forms of governance. The governance structures vary with the intensity of each marketing arrangement. Each of these forms of governance is associated with different co-ordination and control mechanisms, different types of contract law, different disturbance and adaptation mechanisms, and hence different appropriateness to transaction with different characteristics. Williamson (in Dorward, 1999) goes on to state that if economies of scale and scope are held constant, the choice on contractual forms turns entirely on governance costs, implying the inclusion of all costs that vary between contractual forms. The contractual form with the lowest governance costs (or with the highest 'transaction margin' of revenue over governance costs, providing for pure transaction costs and profit) will be preferred. This study borrows from this background and takes governance costs as the totality of costs incurred in settling a transaction in a particular contractual arrangement but varying across different arrangements.

6.2. Review of Performance Evaluation Methods

Contractual and relationship analysis is a complex process concerned with effects on performance of both existing and missing institutions. The analysis is complicated because behaviour is influenced by a matrix of institutions, some formal and some informal. Performance in this case refers to outcomes or consequences in terms of the well being of members of a group, following from existing or alternative sets of institutions. Because institutional analysis necessarily deals with performance indicators, the selection of measurement of performance indicators is of great importance (Shaffer, 1995). Various analytical approaches to measuring performance have been used.

One way of measuring this performance is by evaluating transaction costs. Transaction costs include information costs, negotiation costs, monitoring costs, and the costs associated with enforcing contracts (Robins, 1987; Hobbs, 1996). This is also in line with use of cost effectiveness (van Hoek, 1998), and ability to control cost (Fearne and Hughes 1999) and return on investment (Lendrum 1998). The lower the transaction cost, the better a farmer realises from the exchange process.

Following on theoretical foundations laid by Williamson on governance costs, we conceptualise farmers behaving in a 'governance cost minimising' when choosing among contract governance structures. The contractual arrangement with lowest governance costs among alternatives with equal governance revenue (or with the highest 'transaction margin' of revenue over governance costs, providing for pure transformation costs and profit) would be preferred. This measure of performance is more encompassing than the use of pure transaction costs described above. Governance costs also include

transformation costs that vary with contractual arrangements as well as risk of loss associated with each arrangement.

Gross Margin Analysis

Gross margin analysis entails an analysis of profit margins attained in an activity or enterprise. Sometimes it is called gross profit and it is based on the concept of contribution from marginal costing in farm management (Johnson, 1990). It has been widely used for analysis of enterprise viability, e.g. Cotton in Swaziland (Shongwe, 1999) and in dairy production (Sifundza, 1997). Kohls and Uhl (1990), defines it as the difference between the price paid for a unit of produce and the variable costs a producer (farmer) incurs to have that product. Gross margin may be expressed as a percentage of the firm's selling price. Gross margin analysis only reflects gross profits and it does not show returns on investment made in an enterprise. Comparison on enterprise performance can only be meaningful if they produce a similar commodity. Because of this weakness, use of gross margin analysis in this study is only limited to comparisons of gross income of a commodity traded on two different markets. To obviate the problem inherent in Gross margin analysis, return on variable cost is used as a performance ratio. Return on variable cost is calculated by dividing gross margin value by total variable costs. Return on variable costs shows the return on every dollar invested in variable costs and this can be compared meaningfully across enterprises producing different crops.

6.3. Review of Empirical Research Literature

An evaluation of the soyabean technology transfer experience in Ponorogo, India by Soegianto et al. (1987) suggests that input-marketing and output-marketing linkages affect the likelihood of sustaining technological innovations. In this area, the following hindered adoption of technology.

i) lack of a secure marketing system for improved soyabean varieties,
ii) high transaction costs of fertiliser,
iii) lack of a user-friendly capital market and
iv) an output marketing system with no premium paid at the farm gate for good-quality beans.

Marketing has also been considered the principal constraint to increased soyabean production in Zaire and Nigeria (Shannon and Mwamba, 1994). A study conducted in Zambia by Chiyobe (no date) on contract farming revealed that farmers benefited mainly from improved availability of input credit and extension service. Producer prices were not much of an incentive for farmers to enter into agreements with agro-processors. Farmers also indicated that they entered into contract to obtain inputs and benefit from the auxiliary and technical advice provided by the contracting company. The major problems that emerged are as follows:

i) Low producer prices, which led to side marketing i.e. sale of crops through 2nd party to avoid loan repayment.
ii) Late payment that led farmers to opt for on-the-spot payment and even accept lower prices by competing alternative buyers.
iii) Inability of smallholder farmers to understand the pricing structure of their produce. This led to price negotiations that took unnecessarily long.

All the problems listed above are institutional and they put soaring pressure on the transaction costs incurred by farmers on the market. Contract farming or smallholder outgrower schemes have their disadvantages if not properly executed. The major one being that benefits have been skewed to the contracting firm. In some cases these arrangements have led to a shift to more cash crops at the expense of food crops. These problems have expressed themselves in Zambia and of late are evident in Zimbabwe.

Lack of access to inputs and low producer prices was found to be limiting adoption in Hurungwe in particular (Mudimu, 1996), and for all smallholder farmers in Zimbabwe (Johnson et al, 1994). Whingwiri (1996) did a soyabean production promotion project in Hurungwe in the late 1980's concentrating on training extension workers in soyabean production and use in various food preparations. The project was however ceased in 1989 despite apparent substantially positive results. He reported no market problems and this could be because the market for soyabean was guaranteed then.

In Zimbabwe, the soyabean promotion task force reported that soyabean production expanded but growth was being limited by the extension and marketing capacity of the marketing arrangement created by the task force. They made an arrangement to assist farmers with extension, organising input supplies (inoculants, seed and lime) and in marketing or selling the produce. The key question about this set-up has been on its sustainability over space and time, given the reported high adoption rate and the SPTF's resource capacity.

7. Conceptual framework

Williamson (1985) defines transaction cost analysis as an examination of the transaction costs of planning, adapting and monitoring task completion under alternative governance structures. He states that if economies of scope and scale are held constant then the choice of transaction arrangement turns entirely on governance costs. Governance costs implying the inclusion of all costs that differ between contractual forms.

The costs incurred in a transaction can be classified into four different types of costs (Williamson 1985, Dorward 1999). The cost categories are listed below and they helped in conceptualising of transaction costs, empirical data collection and analysis.

i) Pure Transformation Costs (P)

Production costs that are not affected by the choice of contractual form e.g. seed, fertiliser and other machinery costs that are not significantly affected by contact choice. Pure transaction costs are not part of governance costs.

ii) Associated Transformation Costs (F)

These are also production, processing and marketing costs. They differ from pure transformation costs in that they vary with contractual arrangements chosen.

iii) Pure Transaction Costs (TC)

North defines these as information costs of making contacts, screening, negotiation, transferring risks, contract monitoring and enforcement.

iv) Associated Risk of Loss (L)

Defined by Williamson as the different risks of loss associated with different contractual forms.

In this study we shall assume that the risk of loss does to vary across models and there is certainty in performance on the part of the buyer. Thus, associated risk maybe mentioned but it is not measured or analysed in this study. Because pure transformation costs do not vary across different contractual arrangements, they are not included in the analysis of governance costs.

8. Analytical Framework

Different models/mechanisms of agricultural input supply and produce marketing in use in the private and public sectors relate suppliers, buyers (local and external), traders, credit suppliers and other facilitating organisations with farmers. In this research, four models were picked for analysis. These are the GMB Input Scheme, Soyabean Promotion Task Force (SPTF) scheme, Cotton Company of Zimbabwe Input Scheme and the Chibuku Breweries contract grower scheme.

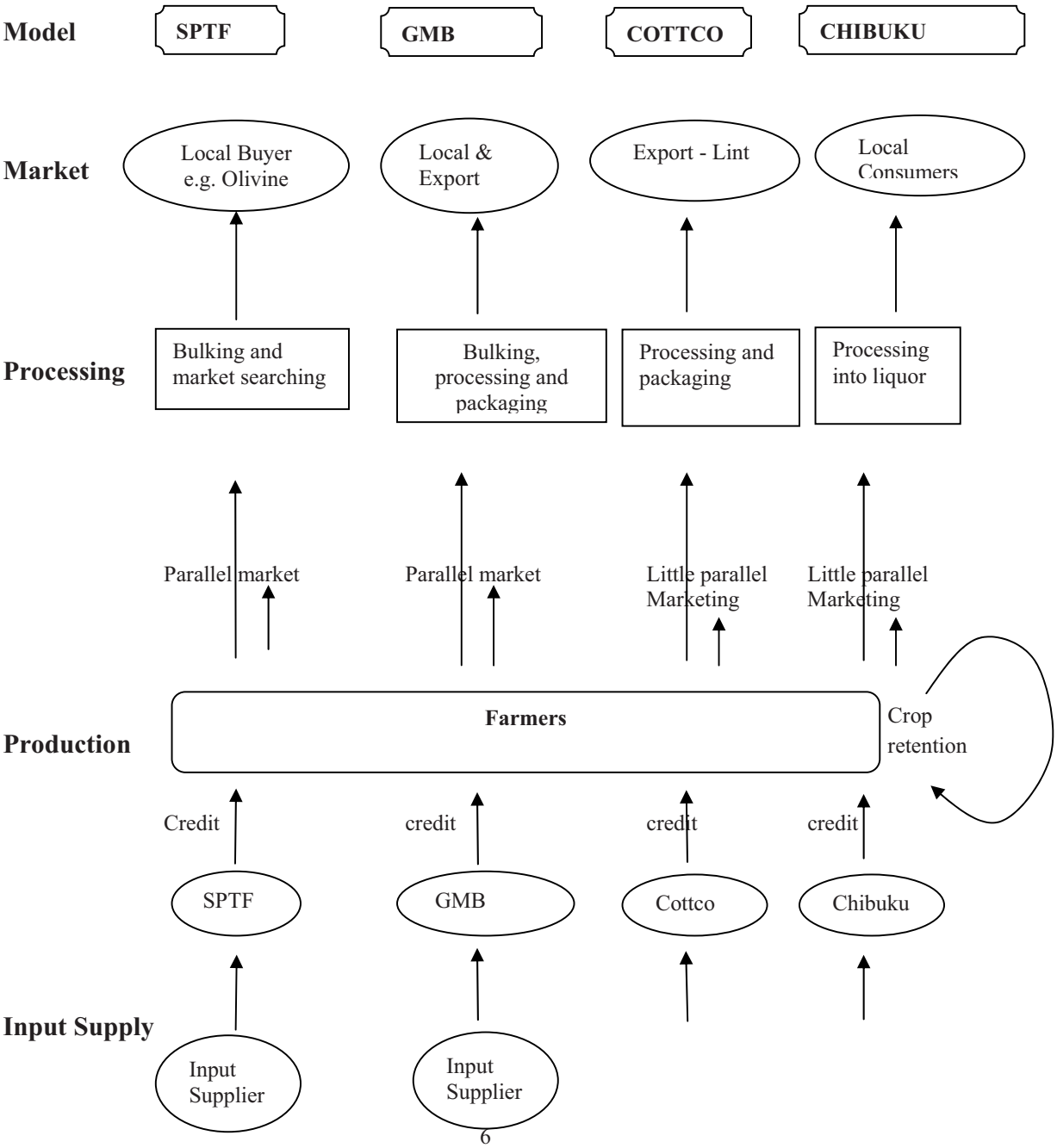
Table 1 below highlights some of the major characteristics of different input supply and produce marketing mechanisms in the agriculture sector. A similar but more detailed table is presented after an in-depth analysis of the models. The flow of inputs, produce and services in some of the models is presented diagrammatically on figure 1. The diagram is just an illustration and is not exhaustive of all models in practice in the agriculture sector (e.g. GMB input supply and the Citizen Network's Agro-dealer models are not included).

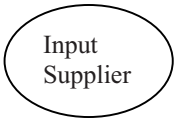
Table 1. Characteristics of Agric-Input Supply and Output Marketing Models

SERVICES		MODEL			
		SPTF	GMB	COTTCO	CHIBUKU
Input delivery on cash basis		✓	✓	-	✓
Input delivery on credit basis		✓	✓	✓	-
Technical support		✓	✓	✓	-
Secure output contract		-	✓	✓	✓
Output transport to market		✓	-	-	-
Output processing/ packaging		-	✓	✓	-
Nature of crop:	Food vs Cash	Soyabean F & C	All Grains F & C	Cotton C	Sorghum F & C
	Side marketing	High	high	minimum	N/A
	Home consumption	yes	possible	none	possible

Source: own

Figure 1. Flow of Inputs, Produce and Services in the Marketing Models





Source: own

9. Methodology

9.1. Evaluation of Performance of Each Model

Crop budgets were developed from survey data and secondary data from other sources like the Agritex, in order to provide information on gross margins. Gross margins were computed and then used to calculate the return on variable costs incurred by farmers in each model. These financial ratios represented financial performance of each model from the farmer's point of view. Contract governance costs were calculated based on price data from the survey and the market. Transaction costs incurred by farmers in each model were estimated as a summation of information, negotiation and monitoring costs. High costs of governing a contractual arrangement are taken to show inefficiencies in the operations of a model. Thus levels of transaction and transformation costs represented relative efficiencies in terms of cost effectiveness.

9.2. Comparison of SPTF performance against GMB, Cottco and Chibuku Models

A one way ANOVA test is conducted to check the difference among means of the performance measuring variables (return on variable cost and governance costs) across the four models. SPSS is used to generate least significance difference (LSD) tables to show the significance of the difference between among the four means. The LSD table basically uses t-tests for the difference between two means.

9.3. Data Collection

Research Site and Model Selection

Surveys were conducted in Buhera, Hwedza and Shamva districts. Four marketing arrangement models used by the SPTF, The Grain marketing Board (GMB), Chibuku Breweries Private Limited and The Cotton Company of Zimbabwe (Cottco) were selected for analysis.

Buhera and Hwedza were targeted because there has been significant adoption of soyabean as a result of previous work on soyabean production. For SPTF, GMB and Chibuku models, farmers were also selected from the same areas (Buhera and Hwedza) to enable a fair comparison with the SPTF model. Cottco farmers were selected from Shamva district because Buhera and Hwedza are not cotton producing areas. Shamva represented an almost similar smallholder communal set-up with almost the same distance from Harare as the Buhera and Hwedza. Although Cottco was present in these

areas, it was only there to promote groundnut production. The groundnut scheme was aborted after a one trial year.

The basis for selection of the SPTF was to get an example of a non-governmental, non-profit making organisation with farmer interest. The SPTF, made up of various stakeholders in the agriculture sector was also included because it has promoted the production of soyabean and its model forms the foundation from which any successor model would build on. The GMB input credit scheme was included in the study to represent a government driven model that also have a responsibility to improve lives of its constituent through enhanced crop production. The objective of the scheme is more for social than commercial reasons. The Cottco and Chibuku models were included in the study so that they represent a model from the private sector whose motivation is commercially focused.

These contractual arrangements were also picked because they differ in levels on integration between farmer and agro-firm such that they represent an array of different levels of contractual relationship. The range starts from the Chibuku model where farmers are supplied with sorghum seed only, to the GMB model where farmers get seed, fertiliser and extension, then the SPTF where farmers get seed, inoculant and marketing services, up to the Cottco scheme which provide farmers with seed, fertiliser, chemicals, extension and marketing services.

Sample Surveys
A sample survey was carried out on representative samples of farmers, focusing on registered and point data on crop production, nature of each model arrangement, benefits, incentives, marketing costs, transaction costs and problems they faced in procuring inputs and marketing the produce. 50 farmers in each model were randomly selected. Secondary data from the organisations involved in soyabean-input supply and produce marketing also augmented primary data from the surveys. A data set was created using the Statistical Package for Social Sciences (SPSS). This computer package was used for accurate and speedy processing of data for descriptive statistics, t-tests and analysis of variance.

9.4. Data Analysis

The exploratory data analysis revealed simple patterns in the data. This included simple analyses to show frequencies, measures of central tendency (mean) and central dispersion (variance) from the survey data. Results of this analysis were used to address the first objective of this study; that of examining problems encountered and benefits realised by farmers and contracting agricultural firms in different grain marketing arrangements in the smallholder sector.

A comparative analysis on performance of the different contractual marketing arrangements was done using one-way analysis of variance (ANOVA). This tool is applied when comparing means across more than two samples. A paired samples t-test was used to analyse the difference between contractual arrangement returns and open market returns. Return on variable cost was used as an indicator of returns accruing to

farmers who invested in producing under a particular contractual arrangement. This ratio was calculated as follows:

$$\text{Return on Variable cost} = \frac{\text{Gross Margin/ha}}{\text{Variable Cost/ha}}$$

Performance on each arrangement was also analysed through the level of transaction and transformation costs (also called contract governance costs) incurred by farmers.

10. Results

10.1. Farmer Benefits from Marketing Arrangement Models

Sustainability of the relationship with farmers has to be built on commitment and trust. This commitment and trust can only be meaningful to farmers if they can realise tangible benefits from entering into the relationship. Farmers revealed the major benefits they got from the respective models and these are tabulated in Table 2. A substantial number (30 percent) of respondents did not get benefit from SPTF and Chibuku (40 percent). For the GMB and Cottco Models, farmers benefited mainly from input credit.

Table 2. Major Benefit of the Arrangement to the Farmer

Benefit	Percent in a Model			
	SPTF	GMB	Cottco	Chibuku
No benefit	30	8	12	40
Inputs	16	20	10	4
Transport for inputs	6	0	0	2
Input credit	10	48	26	2
Market information	2	0	0	0
Market for produce	0	2	2	12
Cheaper Inputs	0	4	0	0
Training	10	0	0	2
Extension	8	0	0	0
Increased production	2	0	2	2
More income	8	16	48	36
Varied nutritious foods	6	0	0	0
Total	**100**	**100**	**100**	**100**

Source: survey data

10.2. Problems Facing Farmers in The Contractual Arrangements

Results in the previous section testify that farmers are facing problems with the contractual arrangements they have entered. These problems or constraints detract their potential benefits from the relationship they have with their contractual partners. Farmers divided the problems into two groups: input supply problems and produce-marketing problems.

10.2.1. Major Input-Supply Problems Facing Farmers in Each Model

Table 3 shows frequencies of major problems faced by farmers in procuring inputs. Only a small proportion (up to 6 percent) across the four models saw no major problems with regard to input procurement in their contractual arrangements. The rest (between 94 and 100 percent) had problems in each model.

The SPTF is faced with the challenge of bringing inputs closer to the farmers. Farmers cite problems of long distances to the input market and availability of transport. These problems can be summarised to mean that inputs are not available at local outlets. Soyabean inputs, particularly the seed and inoculant, were not available in local outlets. Farmers had to travel long distances to buy these inputs or wait for the SPTF to deliver them to centres closer to them. Lack of price information was another major problem. Farmers pointed out that there was not enough information on input cost and the alternative sources of these inputs.

Table 3. Major Input-Supply Problems Faced by Farmer

Problem	Percent in a Model			
	SPTF	GMB	Cottco	Chibuku
No problem	4	4	6	0
Lack of price information	10	0	0	0
High price levels	4	14	16	18
Lack of capital	6	0	2	2
Low input quality	10	0	0	4
Low input quantity	4	2	4	2
Poor storage facilities	2	0	0	0
Transport availability	24	0	4	0
Transport cost	4	4	22	20
Long distance to the market	28	0	4	8
Availability of inputs in local outlets	2	0	0	2
Late input supply	2	72	36	44
Separate supply of inputs	0	2	6	0
Slow service at depot	0	2	0	0
Total	**100**	**100**	**100**	**100**

Source: survey data

A problem of low input quality was also raised. This referred mainly to the soyabean seed kept from the previous year's crop. Farmers also raised concerns on the limited choice on varieties of soyabean supplied to farmers.

Farmers working with GMB point out that late input supply is the major input problem they are facing. High prices are also a cause for concern with these farmers. Cottco and Chibuku farmers are mostly worried about late input supply, high transport costs and high prices of the inputs.

10.2.2. Major Produce-Marketing Problems Faced by Farmer

The major problem that has affected farmers in the SPTF, GMB and Cottco models is that of low producer price. See Table 4. Farmers are not satisfied with the price they are getting for their produce. This could be explained by their weaker bargaining power in this oligopolistic market.

Table 4. Major Produce-Marketing Problems Faced by Farmer

Problem	Percent in a Model			
	SPTF	GMB	Cottco	Chibuku
No problem	4	26	4	0
Lack of price information	10	0	0	0
Lack of processing knowledge	4	0	0	0
Poor storage facilities	6	0	0	2
Transport availability	10	8	14	6
Transport cost	4	14	22	52
Long distance to the market	2	4	12	12
No market for produce	24	2	0	0
Lack of information on buyers	4	2	0	0
Low producer price	28	32	38	18
Late supply of inputs	2	0	0	0
Late payment	2	8	2	8
Empty bag cost	0	4	0	2
Unfair grading	0	0	8	0
Total	**100**	**100**	**100**	**100**

Source: survey data

The buyers are paying prices lower than farmers' expectation. Chibuku farmers felt they were faced with excessive transport costs for their sorghum. This is explained by the fact that Chibuku required every farmer to deliver their produce to their malting plant in Harare. This meant farmers had to meet transport costs from Buhera to Harare. As such, transport cost became a conspicuous cost on their budget.

SPTF farmers also faced a problem of lack of market for their produce. The GMB could have been another option but because it was not paying competitive, it automatically fell out of the farmer's market options. Small volumes sold by farmers scattered across long distances made it expensive for traders and processing companies to service these farming areas.

There is a fairly large number (26 percent) of farmers in the GMB model who have no major problems in marketing produce as compared to the other three models. This maybe because of the spread of GMB depot network to reach more farmers. Use of these GMB

depots to distribute inputs and collect produce brings the market place to the farmer, thereby reducing the costs associated with input procurement and produce marketing.

10.3. Benefits realised by Agro-Firms in Their Contractual Arrangements with Farmers

In devising these contractual arrangements, each buying organisation realised that they are better off or they would realise their goals better with some form of contractual arrangement with farmers than using the open market. These contracts are made in line with fulfilling the firm's objectives efficiently and effectively. When asked how these arrangements had benefited them, each contracting organisation's response was inclined to the nature of the organisation, its objectives or goals.

Contractual arrangements in soyabean marketing have enabled farmers to sell their crop on profitable markets, leading to improved farmer incomes. These agreements have helped the SPTF realise the goal of promoting soyabean production in the smallholder sector.

The GMB runs a government sponsored input scheme with the objective of increasing national agricultural production. As a commercial organisation, the GMB would also want to increase the volume of the crop it handles. The contractual arrangements they entered with farmers has helped them increase commodity intake volumes over the years, at the same time achieving the government objective of increasing national crop production.

The Cotton Company of Zimbabwe (Cottco) uses its contract scheme to boost volumes of cotton produced and marketed through the company. The contractual agreement has helped the company attain and maintain the greatest market share in the local cotton processing industry.

Chibuku Breweries use specific sorghum varieties in the malting process of beer brewing. At the start of each production year, the company would want to have a secure supply of sorghum to maintain their malting plant running throughout the year. The contracting of smallholder farmers has provided a secure supply of predetermined sorghum quantity, quality as well as price.

10.4. Problems Facing Agro-Firms in Their Contractual Arrangements with Farmers

The organisations contracting farmers to grow and supply them with produce also face problems and/or constraints in fulfilling the agreements so that they can get the best out of these relationships. However, problems faced by these organisations are not as many as those faced by farmers. This could be because the power to control cost variables in the contract is skewed in favour of the few buyers as opposed to the many sellers. These firms are literally the architects of the contracts. This is characteristic of oligopoly markets. These organisations can unilaterally decide to share or shed those costs or risks

should they become a burden to them. In such instances, the farmers are left with the options of either remaining in the contract or pulling out of the contractual arrangements. Problems encountered by the four organisations in the studied marketing arrangements are presented in Table 5.

Table 5. Major Problems Facing Agro-Firms in the Contractual Arrangements

SPTF	GMB	COTTCO	CHIBUKU
Side marketing	High input prices	Side marketing	Small volumes from individual farmers
Limited resources (Human and financial)	Limited financial resources	Increasing default rates	Limited financial resources for complementary inputs
Availability of inputs from supplier	Availability of inputs from suppliers		Lack of handling and storage facilities close to farmers
Lack of handling and storage facilities	Transport for input distribution		

Source: survey data

The SPTF had problems with farmer who side marketed some soyabean and those who failed to repay credit when in fact they had produced enough to sell. Though the side market is thin, prices are much higher than those paid by the SPTF. The high returns on this market coupled with low marketing costs and less hassles that the farmer met has been a lure for side marketing. This gave way to increased incidents of repayment defaults, leading to losses for the other contracting party. Soyabean seed, more so the required varieties and the necessary inoculant (rhizobium) were not easily available from the suppliers in volumes enough to meet the market demand. As expected, the SPTF cited the problem of resource limitations in expanding the coverage of the scheme. This was because the task force operated on a limited project budget.

Like the SPTF, the government-run GMB model is faced with a problem of financial resource limitations. GMB input orders have overwhelmed suppliers of inputs, especially fertiliser to the extent that shortages on the market have been witnessed due to the impact of the input scheme. When these inputs were available, GMB was not happy with the prices. Availability and cost of transport for distributing inputs to depots closer to farmers was another challenge facing the GMB.

The Cotton Company of Zimbabwe faced two related problems. They reported increased incidents of side marketing as well as increasing loan default rates.

Small volumes of sorghum spread across wide geographical area posed problems for Chibuku Breweries with regard to mobilising and consolidating these quantities for transportation to their malting plant in Harare. Lack grain handling and storage facilities for sorghum has kept Chibuku breweries far away from farmers in terms of input and crop delivery.

10.5. Comparative Analysis of the Performance of The Alternative Marketing Arrangements

The results in Table 6 show that the return on variable costs on soyabean enterprise is highest at 1.47. Every dollar spent on variable costs for the production of soyabean under the SPTF arrangement returned 47 cents. The return is more than that from cotton, which has the highest gross margin across the four models.

Table 6. Comparative Analysis of Return on Variable Costs

Measure	Amount			
	SPTF	GMB	COTTCO	CHIBUKU
Gross Income /ha (model price)	$13 916.75	$12 342.64	$28 829.53	$12 880.66
Total Variable cost /ha (Model)	$5 637.80	$5 734.54	$13 894.74	$5 490.91
Gross Margin /ha (Model price)	$8 278.95	$6 608.10	$14 934.79	$7 389.75
Return per dollar invested in variable costs (model price)	1.47	1.15	1.07	1.35

Source: survey data

Following SPTF is the Chibuku arrangement that returns 35 cents on every dollar spent on variable costs. The gap between these two ratios is due to the subsidised nature of the SPTF model in terms of input costs. The GMB model yields 15 cents per variable cost dollar. The least rewarding model in terms of return on variable cost is the Cottco model that returns only 7 cents on every dollar spent on variable costs. This is attributed to the high variable cost of producing cotton especially in purchasing chemicals. However, these differences are only absolute and could be due to chance.

In order to check on the significance of these differences, a one way analysis of variance (ANOVA) was run at 0.05 level of significance to check on the significance of the differences on the return on variable cost. A table (Table 7) of Least Significant Differences (LSD) between the means was drawn up using SPSS to show one-on-one comparison on the means.

Table 7. Multiple Comparisons of Return on Variable Costs.

Marketing Arrangement Used by Farmer (I)	Marketing Arrangement Used by Farmer (J)	Mean Difference (I-J)	Sig.
SPTF	GMB	0.9413	0.056

	COTTCO	1.6736*	0.022
	CHIBUKU	0.9211	0.216
GMB	SPTF	-0.9413	0.056
	COTTCO	0.7323	0.647
	CHIBUKU	-1.0202	0.513
COTTCO	SPTF	-1.6736*	0.022
	GMB	-0.7323	0.647
	CHIBUKU	-1.7525	0.278

The mean difference is significant at *0.05 level, ** 0.01 level
Source: Survey data

Thus, we reject the first hypothesis stated above and conclude that soyabean farmers realise higher returns from selling through the SPTF than cotton farmers engaged in the Cottco scheme only. Otherwise the returns are similar to those gained by maize and sorghum farmers in the GMB and Chibuku models respectively. This analysis has shown that although the Cottco model yields higher gross margins, enterprise profitability in the SPTF model as represented by the return on variable costs, is significantly higher than in the Cottco model but not different from profitability of other models to the farmer.

Comparison of Incomes from Model Arrangement versus Side Marketing

All farmers producing within any of the four model-arrangements received support from a contracting agricultural firm in terms of input supply, credit or technical knowledge though-out the production process. However, when it comes to selling the produce, the farmers were faced with two options. Either to abide by the contractual agreement and sell to the contracting firm or to illicitly sell the produce elsewhere (side market). The opportunity cost of selling within a marketing arrangement, which is selling on the open market, presents either an incentive or disincentive for farmers to remain with a contractual arrangement and shun side marketing. Farmers are assumed to be rational in decision making and would only make a decision on the market channel to use after evaluating (consciously or subconsciously) the benefits associated with each and then choose a more beneficial one.

Gross Margin Analysis

Gross margins were calculated on the two market channels and the results are presented on Table 8 below.

Table 8. Intra Model Gross Margin Analysis

Measure	**Amount**			
	SPTF	**GMB**	**COTTCO**	**CHIBUKU**
Gross Income /ha (model price)	$13 916.75	$12 342.64	$28 829.53	$12 880.66
Gross Income /ha(open market price)	*$26 565.39*	*$30 239.55*	*$19 541.49*	-
Total Variable cost /ha (Model)	$5 637.80	$5 734.54	$13 894.74	$5 490.91
Total Variable cost /ha (open market)	*$4 007.56*	*$5 297.96*	*$13 412.56*	-

Gross Margin /ha (Model price)	$8 278.95	$6 608.10	$14 934.79	$7 389.75
Gross Margin /ha (open market price)	*$22 557.83*	*$24 941.59*	*$6 128.99*	-
Proportion that side marketed part or all produce	*26 %*	*34 %*	*6 %*	*0 %*

Source: Survey data

Cotton grown under the Cottco scheme has the highest gross margin per hectare ($14 934.79), followed by the soyabean grown with the SPTF model ($8 278.98), then GMB with $6 608.10 and finally Chibuku's sorghum which pays $7 389.75 per hectare. On the open market, the picture is now reversed, with GMB maize fetching the highest gross margin/ha ($24 941.59) followed by soyabean from the SPTF with $22 557.83 and lastly Cottco with $6 128.99. No farmers from the Chibuku brewery sample sold their sorghum to a different brewery at all. It is important to note that for the SPTF and GMB arrangements, the open market gross margin is higher. This is a potential lure for farmers to side market. The proportions of farmers who sold part or all of the contracted soyabean crop on the open market also reflect this.

The maize[1] grown under the GMB scheme during the period of study fetched a better price from local buyers who bought for consumption or from other traders competing with GMB. Farmers growing cotton in the Cottco arrangement realised more gross income from selling to the Cotton Company of Zimbabwe than selling to other traders or other cotton companies. Farmers contracted by Chibuku Breweries did not sell on the open market. The specificity of the sorghum varieties used and the lack of a ready market for this type of sorghum may be the reason. As such, most farmers are bound to the brewery. It could well be that farmers are so loyal to their agreement that they would not want to side market.

The gross margin figures suggest that more would be realised by the farmer through selling soyabean and maize on the open market. The gross income from selling through the SPTF and GMB models was lower in absolute terms than the income from the open market. This is attributed to a higher price paid on the open market. The open market has predominantly been to local neighbours for consumption or seed purposes and also to traders who would resale the crop to agro-processing firms. The total variable costs are higher if a farmer sticks to the model to the end than if they sold elsewhere. This difference can be attributed to the low transport costs involved when farmers sell to traders (cotton) and/or locals (soyabean) who come to their doorstep.

Test of Significance on Difference between the Gross Margins

In order to ascertain whether the gross margin per hectare is indeed greater for produce sold on the open market than that sold through the models arrangements, paired sample *t* tests were conducted. The researcher posited that:

H_2 *Smallholder soyabean farmers realise more income per unit sold on the open market than they realise per unit sold through the SPTF.*

[1] During the period of study, 2000/2001 season, maize was a decontrolled commodity on the market.

Table 9 also shows that although the absolute values of gross margins from GMB is greater than the gross margin from side marketing, there is no significant difference between the gross margins. The apparent difference is only due to chance. Farmers growing maize with the GMB do not have an assured financial incentive on the open market. The same applies to Cotton, which has an apparent greater return with in the model than on the open market. There is no significant difference in the average means of the gross margins between these two market channels. This could be the reason some farmers are just selling to middlemen instead of waiting to sell directly to Cottco. They realise that the difference is insignificant and will continue to sell to the middlemen up to a point where they start realising significantly lower returns of gross margins.

Table 9. T Test for Difference between Model Arrangement and Open Market Gross Margin.

	Paired Differences			t	df	Sig. (2-tailed)
	Mean (**Model – Open Market Gross Margin**)	**95 Percent Confidence Interval of the Difference**				
		lower	**upper**			
SPTF	-8 187.01	-13 828.20	-2 545.85	-2.943	12	.006*
GMB	-6 796.54	-17 676.72	4 083.63	-1.340	14	.202
COTTCO	1 408.47	-3 274.68	6 091.62	1.294	2	.325

Source: Survey data. *The mean difference is significant at .05 and .01 level

At 0.05 level of significance, the p (sig.) value shows that there is a significant difference between the two means and that the gross margin per hectare is higher on the open market prices than in the SPTF marketing arrangement. Thus we reject the null hypothesis (H_2) stated above and the logical conclusion would be that soyabean sold on the open market bring more income per unit than that sold through the SPTF. This scenario provides incentives for farmers to default from their contractual obligations with the SPTF. The farmer is tempted to sell all produce to the open market and repay debt in cash or sell only part of her produce to the SPTF and reserve the rest for the high rewarding open market.

Despite the presence of this apparent incentive, more farmers have continued to honour their contractual obligation to the SPTF. 72 percent of the farmers sell the bulk of their soyabean through the SPTF. The side market is not pronounced enough for farmers to rely completely on it. It is only an opportunistic thin market for small volumes meant for seed and consumption especially in the areas where most farmers are still adopting the soyabean crop. The quantities demanded on the local market are usually small and uncertain to guarantee a farmer the high return. If more farmers were to keep their produce for sale in this market, then one would expect the prices to fall to levels almost equal to the 'formal' (contract) market.

10.6. Comparative Analysis of the Institutional Arrangement Efficiency

The objective of this analysis is to find that contractual arrangement that has the lowest contract governance costs for the sellers (farmers). The contract governance costs as

defined by Williamson (1991) and classified by Dorward (1999), are made up of pure transaction costs, transformation costs and risk of loss associated with each model. Due to unavailability of data on risk, the risk component is not included in this analysis. The researcher assumed no variability on level of risk across the models. That risk affects transaction costs hence contract governance costs, is known and the weakness of this analysis in omitting risk impact is acknowledged.

Transaction costs, defined as information costs associated with a transaction and acting under its terms, were estimated as the sum of information, searching, screening, negotiation and monitoring costs met by farmers in each contractual arrangement. Associated transformation costs are equivalent to those production costs that vary between different contractual arrangements. This analysis of model efficiency is based on the premise that when a seller enters into a contractual agreement, the objective would be to minimise contract governance costs. A comparative analysis of these contract governance costs across the four models indicates the relative efficiency of each contractual arrangement. In the subsequent sections of this paper, separate comparisons are made on transaction and transformation costs across the four models before the totals (contract governance) costs are compared.

10.6.1. Analysis of Transaction Costs

The researcher posited that:

H_3 *Farmers selling soyabean through the SPTF face higher transaction costs in marketing than those farmers who market their crop produce through other marketing arrangements*

Transaction costs, as classified by Hobbs (1996), were measured under the following three major headlines:

i) Information Costs

This was made up of costs incurred in the discovery of potential buyers and price levels. The costs included time lost and transport incurred in registering and getting price information. In cases where farmers did not incur cash costs, e.g. time lost, they were asked to value that loss in dollar terms. Almost all farmers operated through a small farmer group of up to fifty farmers and each group would pool resources together and send one member to represent them on issues regarding the marketing arrangement.

ii) Negotiation Costs

This covered all aspects of the sale including time, employment of specialists and terms of sale. As with information costs, farmers were asked how they negotiated prices and the time that was lost in the process. Costs associated with this were recorded.

iii) Monitoring Costs

These were made up of costs of activities which occur after a sale has been negotiated, such as monitoring the behaviour of the other contractual party, checking deliveries against prior specifications and costs incurred in enforcing any agreed terms.

Farmers were asked to value their costs in terms of time lost, transport, and other expenses incurred in performing the said activities. The total transaction costs per model indicates the affordability of a model or arrangement to a farmer. The level of transaction cost can also be used as a measure of efficiency. The higher the transaction cost incurred the less efficient the model is. The arithmetic mean of transaction costs incurred by farmers in each model were computed and presented on Table 10.

Table 10. Transaction Costs incurred in the Contractual Arrangements

Cost	Mean Cost ($) per Model			
	SPTF	**GMB**	**Cottco**	**Chibuku**
Cost of finding and registering farmers	156.09	162.50	367.50	609.42
Cost of finding market information	204.59	156.00	751.67*	843.33*
Cost incurred in negotiating prices	549.00	30.00	0.00	314.44
Cost of monitoring performance of other parties	321.25	400.00	336.00	1199.57*
Cost incurred in getting compensation	0.00	506.67	200.00	1170.67
Other cost	0.00	500.00	300.00	202.25
Total Cost	**1230.93**	**1755.17**	**1955.17**	**4339.68***

Source: survey data. Significantly higher at **0.01 and *0.05 level

The results indicate that the SPTF model is more efficient in terms of affordability to farmers. This could be because the SPTF had many visits to the farmers when they brought seed and inoculate and arranged for collection of produce. Small farmer groups made up of people in very close proximity may also reduce these transaction costs. Chibuku model has the highest transaction costs in absolute terms, indicating that it is the least efficient of the four models.

In order to test the hypothesis H_3 above, a one way ANOVA was run on SPSS on the difference between means. A close look at the differences between paired means was taken on a table (Table 11) for multiple comparisons.

Table 11. Transaction Cost Multiple Comparisons

Marketing Arrangement Used by Farmer (I)	Marketing Arrangement Used by Farmer (J)	Mean Difference (I-J)	Sig.
SPTF	GMB	-231.3316	.598
	COTTCO	-168.5547	.692
	CHIBUKU	-1486.1022**	.000

GMB	SPTF	231.3316	.598
	COTTCO	62.7769	.884
	CHIBUKU	-1254.7706**	.003
COTTCO	SPTF	168.5547	.692
	GMB	-62.7769	.884
	CHIBUKU	-1317.5475**	.002

Source: Survey data. The mean difference is significant at the *0.05 and **0.01 level

The results show that at 0.01 percent significance level, there is no significant difference between means of SPTF, Cottco and GMB model transaction costs but Chibuku model has transaction costs that are significantly higher than each of the other three models. This outcome means the null hypothesis is true for the difference between transaction cost means of SPTF against GMB, SPTF against Cottco and GMB against Cottco but false on the difference between means of Chibuku and any of the other three models.

10.6.2. Analysis of Associated Transformation Costs

According to Williamson's division of contract governance costs, associated transformation costs are those operational costs that vary between contractual forms or contract governance structures. In these contractual marketing arrangements, costs that vary with contractual arrangements are mainly costs of marketing and costs of credit advanced by buying organisation. The cost of packaging, loading, guarding or safekeeping the grain in transit and transport costs met by farmers was summed up for each model as presented in Table 12.

Table 12. Associated Transformation Costs

COST	Amount Spent per Tonne in Z$ (year 2000 prices)			
	SPTF	**GMB**	**COTTCO**	**CHIBUKU**
Bagging	0.00	92.96	100.00	0.00
Loading	831.52	0.00	0.00	400.00
Security and storage in transit	568.07	0.00	0.00	0.00
Transport	1797.08	1159.18	513.85	1790.21
Credit	0.00	600.00	0.00	40.00
Total	**3196.67**	**1852.14**	**613.85**	**2230.21**

Source: Survey data

The SPTF has the highest transformation costs emanating mainly from transport costs of moving the soyabean from Buhera or Hwedza to Harare. Soyabean farmers brought their produce together at a strategically accessible area for easy collection by transporting lorries. Chibuku breweries had the next highest level of transformation costs, also dominated by transport costs. For the GMB model, transport costs were lower because there are GMB depots closer to the farming areas. The cost of credit in the GMB model was at 20 percent and the input package per hectare had an average value of $3000.00. The Cottco model had the least associated transformation costs largely due to the close proximity a Cottco depot. A one way analysis of variance was conducted to find out whether there is a significant difference among the means of the associated transformation costs in the four models. Table 13 shows the results of the ANOVA.

Table 13. ANOVA on Associated Transformation Costs Means in Model Arrangements

Variance	Sum of Squares	df	Mean of Squares	F	Sig.
Between Groups	21509116.079	4	5377279.020	2.152	.076
Within Groups	504700441.452	202	2498517.037		
Total	526209557.531	206			

Source: Survey data

The p value (sig.) value of 0.076 means that at 0.05 level of significance, we may conclude that there is no significant difference among the means in the four models.

10.6.3. Analysis of Total Contract Governance Costs

Table 14 below shows how total contract governance were calculated for the four models being analysed. Share of the farmer on the produce price is calculated by subtracting contract governance costs from the factory gate-price and expressing it as a percentage of the price paid at the factory gate. Contract governance costs are highest for the farmers contracted under the Chibuku arrangement. This is attributed mainly to the high transaction costs associated with this model. The SPTF is next on high governance costs. The task force's governance costs are ballooned by the high transformation costs. The Cotton Company of Zimbabwe contractual arrangements has the least governance costs.

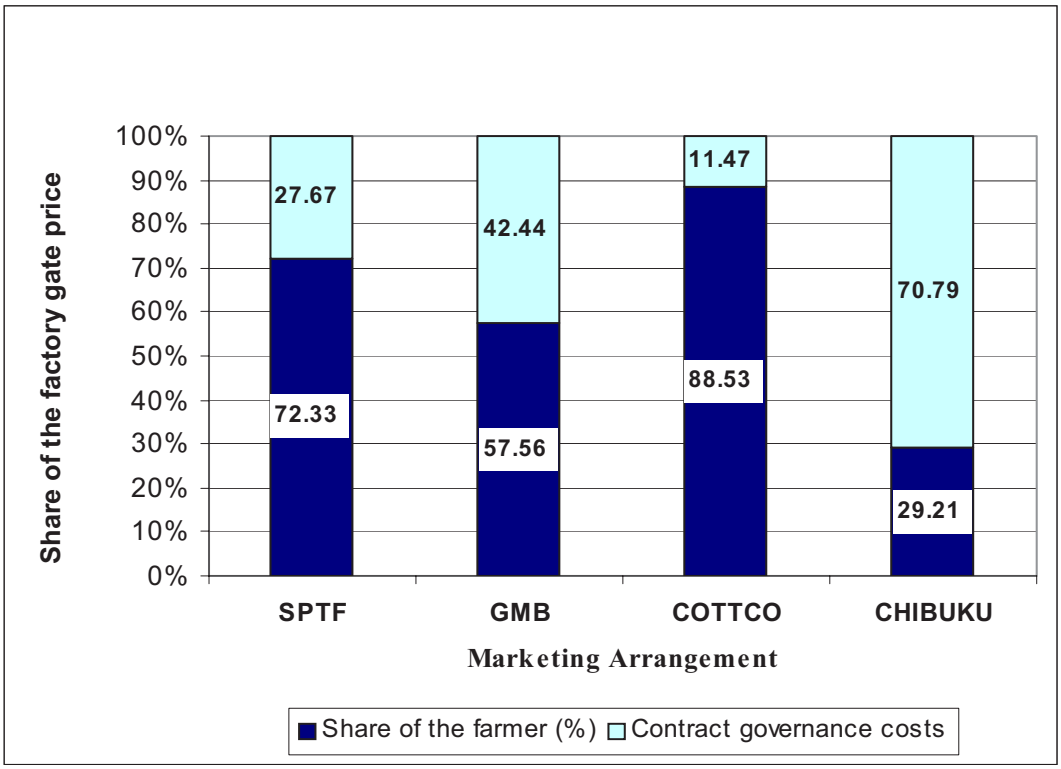
Table 14. Contract Governance Costs and Share of the Factory Gate Price.

Description	Formula	Value in Z$*			
		SPTF	GMB	COTTCO	CHIBUKU
Factory gate price /mt (A)		16,000.00	8,500.00	22,401.20	9,280.20
Associated transformation		3,196.67	1,852.14	613.85	2,230.21
costs (B)					
Pure Transaction costs (C)		1,230.93	1,755.17	1,955.17	4,339.68
Contract governance costs	B+C	4,427.60	3,607.31	2,569.02	6,569.89
	(B+C)/A (%)	27.67	42.44	11.47	70.79
Share of the farmer (%)	D/A*100	72.33	57.56	88.53	29.21

Source: Survey data. * Year 2000 prices

Figure 2 compares the proportions of the farm-gate price realised by farmers from each model.

Figure 2. Share of the Factory-gate Price



Source: Survey data.

In the Cottco model, farmers get the highest proportion of the price paid for the cotton they sell to the company compared to the other three models. The SPTF model has the next highest farmer share of the price (72.33 %). The proportion that is lost as governance costs in each model reflects the cost effectiveness of the marketing arrangements. The greater the governance costs the less effective (efficient) the model, for a given level of governance revenue.

The second hypothesis in Chapter one stated that:

H_4 *Farmers selling soyabean through the SPTF face lowest contract governance costs than those farmers who are contracted to market their crop produce through other marketing arrangements.*

To verify and confirm the significance of the differences in governance costs, another one-way ANOVA was run at 0.05 percent significance level.

Table 15. Contract Governance Cost Multiple Comparisons

Marketing Arrangement Used by Farmer (I)	Marketing Arrangement Used by farmer (J)	Mean Difference (I-J)	Sig.
SPTF	**GMB**	301.1202	.684
	COTTCO	736.3362	.963
	CHIBUKU	-1333.3936*	.017
GMB	SPTF	-301.1202	.684
	COTTCO	564.7840	.723
	CHIBUKU	-1632.2733*	.038
COTTCO	SPTF	-736.3362	.963
	GMB	-564.7840	.723
	CHIBUKU	-1697.0574*	.021

Source: Survey data. The mean difference is significant at the *0.05 and **0.01 level

This result leads us to rejecting the hypothesis H_4 that said the SPTF arrangement has the lowest contract governance costs the other three marketing arrangements. In conclusion, the governance costs incurred by farmers in the SPTF, GMB and Cottco contractual arrangements are similar but lower than those met in the Chibuku contractual arrangement. Therefore the SPTF, GMB and Cottco models perform better for the farmer than the Chibuku model.

11. Summary of Results

Results from the analysis revealed that the Cottco arrangement provides more incentives for farmer to increase crop production, improve produce quality and credit repayment than the other three models. Chibuku and Cotton farmers benefited from improved income as a result of the arrangement. SPTF and GMB arrangements improved availability of inputs and input credit for farmers. Farmers in all the four models were motivated to repay credit by the desire to maintain a good working relationship with the other contracting partner. Late supply of inputs was a major concern for GMB, Cottco and Chibuku models. SPTF farmers and Chibuku farmers felt formal input markets were too far from their farming areas. Farmers felt producer prices were low. Problems of side marketing and unavailability of inputs from suppliers were major constraints for contracting agro-firms. This is consistent with what Rusike et al (2000) found surveys conducted on soyabean farmers in Hurungwe, Guruve and Chikomba Districts. Benefits realised by these contracting agro-firms, as expected depended on organisation objective. Cottco and GMB realised increased crop intakes while Chibuku breweries got an assured quantity and quality supply of produce in each marketing season. The SPTF and GMB expressed satisfaction with the improvement in farmer welfare brought about by their respective contractual arrangements. This analysis revealed that an improvement in service delivery by contracting organisations should emphasise on quick input delivery and increased producer prices. Farmers will be motivated to comply with contractual agreements and the good working relationship they cherish would be fortified. The contractual relationship between the two parties is strengthened through maintenance of

incentives for both parties and the contracting organisations can achieve this through improved input supply and a constant review of producer prices.

A One-way ANOVA demonstrated that soyabean farmers engaged in a contractual arrangement with the SPTF realises higher returns on variable costs, compared to the Cottco model farmers. Returns for farmers in GMB and Chibuku set-up are not significantly different from those realised in the SPTF model. The open market was found to pay significantly higher prices on produce. Although this open market is thin and opportunistic, it tempts farmers to side market part or all of the contracted produce. An analysis of transaction costs inherent in each model revealed that farmers growing sorghum with Chibuku breweries incurred the highest transaction costs compared to the other three models. In absolute terms, contract governance costs for farmers were lowest in the Cottco model and the highest level of governance costs occurred in the Chibuku model. Results of an ANOVA testing the significance of the difference in means showed that the Chibuku contractual arrangement was associated with governance costs that were significantly higher than those met by farmers in the other three models analysed.

12. Conclusion

Major problems facing farmers in contractual arrangements relate to late input supply and low producer price. Agro-firms on the other end, faced side-marketing problems. Returns on variable costs are greater for farmers growing soyabean under the SPTF contractual arrangements than the farmers contracted under GMB, Cottco and Chibuku arrangements. The Cottco contractual model is performing better than the GMB, SPTF and Chibuku models in terms of incentives (production, quality and credit repayment).

The Chibuku breweries contractual arrangement is associated with farmer-governance costs that are higher than those incurred in the SPTF, GMB and Cottco models. Farmers engaged in SPTF, GMB and Cottco contractual arrangements incur governance costs that are not significantly different. Therefore the SPTF, GMB and Cottco models perform better for the farmer than the Chibuku model.

13. Recommendations

To address the one of the major complaints raised by farmers, i.e. late supply of inputs, contracting organisations should supply inputs to farmers before the start of a growing season.

Smallholder soyabean farmers should be presented with an array of marketing arrangement options varying in the level on integration, transaction costs, transformation costs or levels of service provision so that a farmer chooses a single or combination of contractual arrangements that optimise net income subject to his/her resource endowment. This calls for trading organisations like GMB or processing firms like Olivine industries to engage soyabean farmers in contractual arrangements so as to give farmers options to choose their desired contract combinations.

The issues of concern to farmers in this study are to do with input supply and producer price can be alleviated at policy level. The government should invest in infrastructure that enables improved availability of soyabean inputs in the farmer's local area. This can be possible through use of the well-networked government owned GMB.

Limitations and Issues for Further Research

Risk has a direct impact on transaction cost. Because of data and time limitations and risk associated with non-performance of either party both parties, occurrence of different market and production conditions was not included in this study.

There is need for an empirical analysis of the effect of risk on choice of contractual arrangements by both the farmer and the buyer (contracting organisation).

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Appendix Ten

AGRICULTURAL POLICIES IN A GLOBAL ECONOMY[1]

Kay Muir-Leresche and Chris Sukume

Globalisation provides opportunities for significant growth. However, unless specific action is taken to ensure that the benefits of the more integrated markets are accessed, globalisation will further marginalise poor economies. The reduction of subsidies and tariffs on agricultural commodities in industrial countries could result in increased exports from Zimbabwe. In order to become active in the globalised market and to retain and expand national markets, local institutions need to be adaptable to changing demand and they must provide security and incentives for investment in biological, physical and human capital. Good access to markets and information through a reliable and affordable communications network is essential.

Macro-economic policies also affect the potential for growth. Exchange rates, inflation, interest rates and fiscal policies all directly impact on the ability of the agricultural sector to respond to international demand. The structural adjustment programme made some progress in developing more flexible and responsive institutions but poor sequencing and lack of commitment undermined these achievements. The 1990s significantly reduced investment in social services, human capital and agricultural research and extension. This will make recovery from the disruptions created by the land redistribution exercise even more difficult. A review of the strengths and weaknesses of the structural adjustment programme in relation to agriculture will help to inform the way forward. The agricultural sector needs to be re-engineered to take advantage of agricultural trade liberalisation, new technologies, changing demand, regional agreements and the global economy.

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[1] based on chapter prepared in March 2003 for Rukuni M, P. Tawonezvi and C.K. Eicher. (Eds). (forthcoming) Zimbabwe's Agricultural Revolution: Revisited. Harare. University of Zimbabwe Publications.

HISTORICAL OVERVIEW OF MACRO-ECONOMIC POLICIES AND AGRICULTURE IN ZIMBABWE

In the first decade of Independence, the disappointing growth record was primarily the result of the inherited system of centralised controls. The high transaction costs and import controls restricted new investments and innovation. Challenges to the status quo were strongly discouraged by the prevailing institutions and attitudes. This was mirrored in the immobility of land which affected the ability of agriculture to respond to the changing environment. There were some significant investments made in human capital and infrastructure in the 1980s with a strong emphasis on education, health and roads. However, access to foreign currency and the import control regimes were reducing opportunities for investment and growth. In addition concerns with increasing government budget deficits[2], high unemployment and poor growth rates led to the implementation of a structural adjustment programme with changes to the foreign exchange allocation system starting in 1989 and the formal acceptance of the Economic Structural Adjustment Programme (ESAP) in 1991.

Changes were made with the conversion of many quantitative trade restrictions to tariffs and the centralised agricultural marketing system, interest rates, exchange rates and banking system were liberalised. However, government expenditure continued to escalate. There were attempts at increasing revenue and in placing some restrictions on expenditure. These reductions were concentrated on health, education, extension, research and other important government service sectors while expenditure on the military, politically motivated expenditure and parastatal losses increased during the 1990s. Not only did these expenditure patterns distort the fundamental balance of the economy, they also served to seriously undermine confidence in the government and significantly reduced both local and foreign investment. There were various ad hoc attempts to attain expenditure targets but to achieve these, the social and productive sectors were sacrificed. As a result the gains in both education and health were eroded, agricultural services to smallholders remained inadequate and infrastructure deteriorated.

Profligacy, lack of commitment and economic rents were the main cause of the failure of the structural adjustment programme in the 1990s. However, the droughts,

[2] The national debt was 70 per cent of GDP in 1989 with an annual budget deficit of 10 per cent.

declining terms of trade, the Asian currency crisis, the failure of the Hartley Platinum Mine, the continued losses from Zisco Steel and the collapse of the United Merchant Bank all contributed to the poor results (Muir-Leresche, 1998). The 1992 drought made it impossible for government to meet its original targets although the counter-factual scenario of the economy facing the drought without having taken measures to decontrol the economy, may have been worse. The 1995 drought further undermined the economy. Despite these setbacks, there were some positive effects from the partial deregulation. There was a significant increase in informal sector activity, particularly with the liberalisation of agricultural marketing and foreign currency controls. Zimbabwe's informal economy grew rapidly and became a major contributor to growth and employment. In the mid 1990s farm workers challenged employers over wages and conditions of service because they had employment opportunities in the informal sector. The massive response to deregulation of the maize industry increased both growth and equity. Small rural and urban millers and oil expressers started competing with the large conglomerates. This response would not have been possible without the liberalisation of access to foreign exchange and reduction of tariffs on vehicles and machinery.

However, the economy remained inhibited by both the static and dynamic effects arising from the remaining controls and regulations which increased opportunities for rent, involved high transaction costs and restricted the expansion of communications. The lack of flexibility inherent in the economy prevented it from responding to economic signals. Until institutions are in place which encourage new investment, new ideas and mobility of resources, economic growth will be limited.

There was an average 2.8 per cent real growth in GDP between 1992 and 1998. There was a fall in national income after the 1992 drought and a small drop in 1995 but in all other years there was positive growth until 1999. But by 2000 the macro-economic position in Zimbabwe was considerably worse than it was in 1990. The situation has since deteriorated. In 1999 national growth fell 1 per cent and the economic situation thereafter deteriorated with negative growth rates estimated at -5 per cent, -10 per cent and -15 per cent in 2000, 2001 and 2002.[3] The foreign reserves were seven months in

[3] Most data are drawn from the Central Statistics Office and the Reserve Bank of Zimbabwe, but the estimated growth rates are based on those predicted by various commercial bank economic reviews.

terms of imports in 1999 but had fallen to 3 days by June 2002. There was no currency available at official rates even for imported inputs with all currency, except that used by government, sourced at 1,200-1,500 per cent above the official rate. Many prices reflect the black-market rates, lessening the potential inflationary impacts of a devaluation. A devaluation would significantly increase the Zimbabwe dollar value of government debt and increase the consumer cost of fuel and electricity which are sourced at the official exchange rate. It would also reduce the very high rents available to those who access foreign currency at the official rates. Inflation was 20 per cent in December 1997, 47 per cent in December 1998, 112 per cent in December 2001, 123 per cent and 216 per cent in January 2003, without taking account of black market prices for scarce basic commodities.

GDP in 2001 was estimated at Z$488 billion dollars. Domestic debt was just under 50 per cent of GDP and foreign debt of some US$4 billion was 50 per cent of GDP at the official exchange rate but 600 per cent at the black market rate. Savings in 2001 fell below 10 per cent of GDP and with high inflation and interest rates held low to reduce debt servicing, savings are unlikely to recover in 2002. Production and marketing of agricultural commodities declined by an estimated 20 per cent in 2001, in a season of relatively good weather. This fall in production was compounded in 2002 by poor rains increasing the urgency of food imports.

The Zimbabwean economy and agriculture in particular declined sharply in the early part of the new millennium. In the smallholder sector late payment, poor prices and marketing controls on maize reduced planting and contributed (together with the land disruptions and the 2002 drought) to the decline in output in 2001 and 2002. When the political and economic situation stabilises, the recovery of the agricultural sector will be a key component to successful development. Some of the opportunities and policies that can release agriculture's potential to be the engine of growth are outlined below, together with the opportunities presented by globalisation and technology.

OPPORTUNITIES AND CHALLENGES OF THE NEW MILLENIUM

Government sources vary between predicting a 7-10 per cent decline whereas some economists predict as high as –20 per cent.

New and Indigenous Technology

Advances in communications have made global integration a real possibility. In order to ensure active participation, Zimbabwe will need to encourage investment in developing the research capacity, information and communications infrastructure to access available knowledge and markets and the leadership and farmer capacity to implement appropriate systems.

Biotechnology has become more widespread but controversy still surrounds genetically modified seeds (GMOs) and Zimbabwe will have to carry out a comprehensive analysis of the costs and benefits of adapting current policies to allow for adoption of some of these improvements. India, the USA and many other large agricultural producers have had significant success in increasing productivity through the use of biotechnology. However, any widespread adoption of GMOs might put at risk Zimbabwe's trade with the European Union which has strict regulations preventing the imports of genetically modified agricultural commodities. The new agricultural structure and the loss of capital and skills may change comparative advantage and reduce the risk to agricultural exports of using GMOs. The beef herd is unlikely to recover – returns to cattle ranching are low and cattle in smallholder systems are more profitable as a store of value and as inputs to the cropping system. It may, therefore, not be important that genetically modified maize is used to feed cattle, if beef exports to Europe are no longer significant. The important point is that attitudes and policies must be re-evaluated in the light of the changed structure. It may only be in the horticultural industry that strict regulations and enforcement are necessary to retain export markets. Research into biotechnology needs to be expanded so that Zimbabwe can assess the health and market risks as well as the benefits of adopting GMOs and then, if appropriate, take advantage of the higher yields.

Organic farming is becoming increasingly important in industrialised countries. The organic produce market is valued at US$ 400 million in California and US-wide has been growing at 20 per cent in supermarkets and in the UK the official government target is that 20 per cent of the food consumed will be organic by 2010 (Clay, 2001). The lower use of imported fertiliser, pesticides and herbicides are suited to smallholder systems. However, it is skills intensive with high management demands. Research, training and

implementation of appropriate systems for organic farming in the smallholder sector needs to be encouraged. The existing permaculture and other organic farming institutions need to be expanded.

Certification will play an increasingly important role both in ensuring the integrity of conventional commodity exports and in accessing the expanding market for organically produced commodities. Credible research and certification institutions need to be established and investment in training and retaining the necessary human capital for agricultural research is essential for Zimbabwe to participate effectively in the global economy.

Zimbabwe's agricultural sector will not be able to rely on skills-intensive and high-input technology because of foreign exchange shortages, reduced capital and access to credit in the former large farm sector, and the changed structure of agriculture. It, therefore, becomes even more important for investment in research into indigenous knowledge and the development of best-bet technology that combine traditional and modern science. Inter-cropping, rotations, agroforestry and other systems that produce relatively high yields at low cost using local inputs suited to smallholder agriculture, need to be encouraged. A review of optimal cropping patterns showed that viability assessments normally include only the principal crops produced in any one field. In these studies maize would frequently show lower returns than cotton, groundnuts and other commodities. However, when the value of the produce from the commodities inter-cropped with maize was included, and the maize retained for home consumption was valued at its purchase price, then in many instances, the farmer's choice was optimal. If a risk premium is added for the uncertainty of the maize market, then maize was the rational choice even where it was not optimal. Inter-disciplinary research which combines biological, social and economic factors and which closely involves the smallholders, will be an important component of successful research blending modern and traditional science.

Indigenous fruits, vegetables, insects and small mammals all have potential to significantly increase livelihoods in particular communities. Research into the sustainability and expansion of the production of these commodities needs to be combined with investigations into the markets. The use of *dambos*, water-saving and

low-cost water harvesting technologies need to be investigated combining traditional methods with low-maintenance modern technology. It is also important to analyse the impact of these activities on the environment and to balance short and long-term effects.

These small-scale interventions are by definition only applicable in localised situations. The farmers themselves will need to undertake the experiments. They are not in a position to take risks and the government and donor agencies could cover the capital costs and modern skills for the adaptation of best-bet technologies to local conditions, while the farmers provide their labour and traditional skills in testing and expanding their use. The inputs provided would act as payment to the farmers for the labour and land they allocate to research, rather than be deemed subsidies. Widespread implementation of farmer-led, process-based research could be used in place of conventional input subsidies and grants (Mann, 1998). The farmers should be contracted and monitored with both their rights and responsibilities clearly articulated to avoid dependency, reduce moral hazard and provide incentives for good practices. Any successful interventions are then likely to spread as farmers decide which are the most suitable practices.

Demand for Agricultural and Agro-industrial Commodities

The terms of trade inevitably turn against agriculture in wealthy countries and to a lesser extent in the international arena, given that most demand for agricultural commodities is income inelastic or negatively correlated to income. However, if the poor countries were to grow rapidly in the short to medium term, there would be an increase in the demand for agricultural commodities as people initially respond to increasing incomes by increasing and diversifying their diets. The low-value, high bulk nature of basic foodstuffs and Zimbabwe's landlocked status and distance from markets preclude a strategy based on increasing incomes in poor countries. Zimbabwe needs to develop production and natural resource use patterns that focus on high-value, low-bulk, luxury commodities that will meet the demands of the rich in industrialised and emerging economies. It needs to be active in determining the direction of demand and in targeting opportunities. Some of these will be for conventional luxury products for Europe and America such as horticultural commodities and handicrafts but others will include environmental "goods" (carbon sinks", species diversity, existence and bequest values

etc) and innovative tourist ventures involving rural areas. This is an area which needs to be expanded and wildlife production in the dry areas may need to be reintroduced. The emerging economies particularly in the Middle East, Asia and Eastern Europe provide unexplored options. These markets need to be actively investigated and opportunities for servicing them need to be researched. Modern communications and technology reduce the high transaction costs and political and social barriers which made this difficult in the past.

Government needs to provide incentives to make it attractive for these markets to be serviced with products that have been processed or partially processed. The multiplier and employment effects would be greatest if the exported commodities were processed in the rural areas. However, this is not always appropriate and careful assessment of current and potential comparative advantage must be made to ensure that export markets are not lost in a drive to add value.

Opportunities for continental and regional trade in agricultural products depend on significantly improving communications in Africa. The increasing sophistication of markets and demand in West Africa, Uganda and Tanzania, provide opportunities for processed agricultural commodities. Many of these countries rely almost exclusively on imports of juices, jams, preserved fruit and vegetables, cereals etc from Europe (particularly France in Ivory Coast and Senegal). South Africa has been effective in penetrating these markets and Zimbabwe needs to ensure that it also competes.

Within the Southern Africa region, natural conditions are often similar and it is difficult to use neighbouring countries as part of a regional maize-security strategy. Nuppenau (1994) showed, however, that intra-regional trade in SADC can soften price increases in the case of severe drought. Access to the South African market for livestock, dairy, textiles and other agricultural commodities are limited by qualitative, quantitative and tariff barriers. These need to be addressed in the light of the favourable trade status for the EC, making it difficult for regional countries to compete with subsidised European commodities. The political uncertainty in Zimbabwe has resulted in the loss of capital and skills to neighbouring countries and active steps will be needed to attract processing, service and transport companies back to Zimbabwe.

Partnerships and the International Environment

In order to participate in the benefits of globalisation, Zimbabwe needs to become an active participant in the fora which affect trade, aid and social capital. The WTO has been more active in articulating developing country issues since the ministerial meeting in Qatar in 2001. The Doha agenda explicitly deals with key concerns of developing countries including capacity building, market access and intellectual property rights (Hertel, Hoekman and Martin, 2002). The discussions highlighted some of the anomalies in agricultural trade and the importance of the removal of distorting internal subsidies. Progress, particularly in the USA, Europe and Japan has been slow. A much more active drive to gain effective access to these markets is required. The reduction of subsidies and tariffs on raw and processed agricultural commodities in industrial countries will provide opportunities for increased exports from Zimbabwe. Qualitative barriers relating to health, environment and social welfare should be open and achievable and not implemented so as to protect industrial countries from developing country exports. Zimbabwe needs to join with other developing countries to lobby for the progressive liberalisation of trade on a non-discriminatory basis, ensuring that rules are consistent with development of poorer countries and in obtaining assistance for the implementation of WTO obligations in developing countries.

The New Partnership for Africa's Development (NEPAD) offers opportunities for partnerships with industrialised countries. It provides for mechanisms to access international private sector investment as well as support for investment in human capital and infrastructure. It emphasises good governance and self-monitoring in Africa and the reduction of unfair practices in rich countries. It is designed to enhance trade and encourage economic growth in Africa. One of the objectives of NEPAD is to assist in allowing Africa to increase its access to international communication and knowledge and to find ways to reduce the increasing gap created by those without effective access to modern technology. Zimbabwean agriculture will benefit from active participation in such initiatives.

Zimbabwe will either have to renege on all its international obligations or seek assistance from the international community to resuscitate the economy and address its

debt burden. The economy is unable to function when over 10 per cent of its GDP is required for interest payments alone. The country will need to attract international capital and aid. In order to encourage investment it will need to reassure private investors that their capital is safe.

The emergence of a strong civil society needs to be encouraged in order to build a national consensus for change which will provide investors with more security than conditionality (Collier, 2000). Bilateral and multilateral aid most often strengthens central government by making the society increasingly beholden to those in power for access to both resources and essential services. It will be important that the aid is structured in such a way that it empowers communities and does not undermine devolution. It needs to actively promote transparency, reduce moral hazard and promote the policy and institutional changes necessary for poverty reduction and growth.

Policies to Promote Agricultural Growth, Diversification and Trade

In order for a liberal government to operate efficiently, there must be a liberal society[4]. A market economy cannot operate in a closely regulated society that does not encourage disintegration, flexibility and innovation. Systems are only efficient if they operate in an environment of norms and regulations which are widely accepted. Political will both in civic society and in government is needed if markets are to effectively allocate resources. To be widely accepted these changes have to make provision to address poverty and equity. If liberalism looks to the market to maximise social welfare but also includes the notion that individuals have a wider responsibility to humanity, then it will have to find effective ways for the gains from market reform to reach a broader spectrum of the population. The pursuit of individual welfare maximises social welfare *at the given income distribution level*, provided there are no market imperfections. However, when signals at the macro level are distorted, during depressions and inflationary spirals, the good of the individual and that of society are often in direct conflict – with consumers spending when the economy would be better served by saving, and vice versa. This, together with market imperfections, is used to justify widespread and conflicting government intervention in macro variables. These interventions however become self-

[4] John Stuart Mill, *On Liberty* 1859 in G.H. Sabine ed *A History of Political Theory* Harrap London 1937

defeating and with the economy operating so far inside the production possibility frontier, both growth and equity can be better served by their removal. With high inflation, high unemployment, very low savings, high debts and no foreign currency, there are strong arguments for an abrupt approach to structural adjustment such as was undertaken in Germany in 1948. The main problem with the gradual approach is that the economy remains in disequilibrium and sequencing, rent-seeking and social pressures can undermine the effort to re-establish a vibrant economy (Muir-Leresche, 1998). The new economy will need to ensure that it encourages institutions, norms and regulations which are flexible and encourage investment. The policies need to address equity, growth and environmental sustainability. Good governance underlies the ability of an economy to function efficiently.

Institutions and Governance

Agricultural development is part of the broader transformation of society to include more than allocative and economic issues. Stiglitz (1999) argues that only "broadly participatory processes ("voice", openness and transparency) promote truly successful long-term development". In order to be effective agriculture requires an environment which encourages investment by small and large farmers, by those with access to skills and resources and by those with limited access. Agriculture, farmers and rural entrepreneurs, the poor and the rural population in general need to find effective mechanisms to actively participate in policy and decision-making processes. Rural communities need to be in a position where they are able to hold responsible authorities accountable for their actions and to lobby for policies favourable to rural development.

Property Rights

Evidence from throughout Africa highlights the essential role played by secure property rights in ensuring both sustainable development and good governance (Turnham, 2000). While the State has allocatory power over key resources, people are unable to demand accountability. Rukuni (1998) has shown that successful tenure is not predicated upon the type of tenure but on the security of the basket of rights. The communal areas act as Zimbabwe's social security net and as such individual property rights are not yet appropriate. However, the allocation of *de jure* rights at village or community level is

essential to encourage rural investment, sustainable use and to promote civic participation in government. While the State retains legal rights to resources, rural people cannot take control of their own lives and this reduces incentives to allocate resources sustainably. It makes it difficult for them to hold authorities accountable for their actions.

Individual property rights in the resettlement areas are appropriate, particularly as these are not closely connected communities. If the State continues to own all land in resettlement areas then the redistribution is unlikely to become an engine for growth, even if provided with support services. Legal and perceived property rights must be secure in the resettled areas to encourage sustainable use of resources. Secure property rights will encourage investment and allow a market to develop for land which is accessible to the majority of Zimbabweans. Such a land market encourages investment and the development of asset value. It could provide substantial gains to both equity and growth.

In the large-scale sector, the size of landholdings must be free to respond to market forces, with incentives to encourage broader participation in commercial agriculture. The land must be taxed reflecting its value to society but it must avoid increasing the transaction costs of subdivision. If the State acquires and resettles large tracts of large-scale farmland, without allowing the remaining holdings the flexibility of subdivision, the highly skewed land structure will remain even if there is greater racial equity. Bautista, *et al* have shown that taxing land and encouraging subdivision results in significant increases for both growth and equity. Existing commercial production is relatively unaffected and smallholder production increases on the land formerly unused. If a resuscitation of agriculture includes re-establishing large farmers, it is important to accompany this with maximum flexibility in land size and investment in developing an active land market. The security of private property rights will need to be re-established before significant investment and full-time farmers are attracted back to the sector.

Devolution and Decentralisation

Urban elites, by organising, centralising and capturing political and economic power have been able to control policy and the distribution of resources. Africa's failure to achieve higher levels of development has been partly the lack of open political systems and the

lack of well-articulated competitive institutions. It has also resulted from highly centralised political, fiscal and institutional systems for rural development. "These high levels of centralization inhibited the development, at local levels, of institutional capacity, limited local resource mobilization, undermined accountability of development programs to local populations and inhibited their participation" (Binswanger and Townsend, 2000, p.1078).

Zimbabwe will need to put in place systems and institutions which empower local communities to take the initiative in their own development. Decentralisation will need to be more than establishing central representatives in rural areas. It needs to ensure that both responsibilities and resources and the power that go with them are effectively devolved to local levels. The process needs to be accompanied by training in management and accounting and the establishment of transparent and accountable allocatory systems. Minimising regulations and encouraging the establishment of competitive small enterprises will reduce the moral hazard facing local elites with increased power.

Uganda has decentralised services and is providing districts with the resources to employ extension workers and hold them accountable to the farmers they serve. Local government need the authority and resources to provide public services. They need to obtain state grants, raise revenue locally and to be able to allocate secure rights to local resources. Avenues for rural investment need to be opened.

Monopolies, competition and corruption.

The decontrol of agricultural markets had many positive impacts for both the large and small-scale farmers and for poor urban households. The reforms reduced the cost of marketing by expanding small trading and milling networks to reduce marketing margins (Jayne and Jones, 1997). The recontrol of the grain markets in 2001 will need to be reversed and the small millers and traders re-established. However, even before the recontrol, there remained many barriers to entry and marketing margins and transaction costs were particularly high in rural areas with poor communications. Regulations in urban areas still favoured established operators and industry concentration in agricultural marketing, processing and input supply remained high, undermining competition and

resulting in inefficiencies and high prices. Existing regulations need to be reassessed and measures put in place to actively encourage new entrants and to reduce transaction costs and increase the security of maize markets.

Economic rents are the result of either monopoly or regulatory power or both. They underpin efforts to undermine liberalisation and encourage an alliance (usually unacknowledged) between some or all of big business, large-scale farmers, organised labour, organised crime and government in an effort to retain opportunities for rents. If development is to result in flexible institutions which discourage corruption, then it is important to invest in the development of small-scale business and farming. Where there are economies of size, larger entities should be able to emerge; the key is to allow the structure to emerge in response to the scarcity and abundance of resources and to continue to respond as development changes these realities. The organic development strategy endorsed by Kornai (2000) emphasises the growth of a new private sector and uses privatisation of state monopolies to encourage many Schumpeter entrepreneurs and embraces creative destruction. Encouraging competition is the key to broadening participation in the economy, increasing producer prices, reducing input and consumer prices and in the process optimising growth and equity. It also reduces opportunities for corruption, reduces transaction costs and empowers people to take advantage of changing circumstances.

Macroeconomic and Trade Policies

Inflation, limited access to foreign currency, high unemployment and uncertainty all contribute to declining agricultural growth. Declining agricultural output in turn contributes directly to reduced national growth and a further deterioration in these variables. The government debt is a major factor in the disequilibrium. Reducing the government budget deficit is essential and an important corollary is the direction of government expenditure. There is an urgent need to invest in health, education, infrastructure, research and extension. These sectors have been seriously undermined in the 1990s which, combined with the effect of AIDS, could have negative long-term consequences from which the economy may not recover. The reduction of military and political expenditure, the sale of parastatals and increased accountability of government

are essential if Zimbabwe is to avoid further deterioration in both the short and long term. They are however insufficient on their own to ensure long-term growth. Even if monetary and fiscal policy are revised to reduce inflation, there still remain a number of areas where the institutions restrict resource mobility, discourage innovation and distort economically rational choices. In addition the economy can only recover when faith in the system is restored in order to break the inflationary spiral and change spending and savings patterns.

There are also a number of areas that were initially liberalised but have since been recontrolled, undermining the earlier gains. The high import duties, particularly affecting transport and the potential for private sector response to the liberalisation of rural markets must be addressed. In addition the managed exchange rate and the reintroduced restrictions on foreign currency have combined with increasing inflation to seriously undermine the competitiveness of Zimbabwean exports. The current exchange rate regime heavily taxes agriculture as it makes it uneconomic for farmers to produce both import substituting and export commodities.

Bautista, *et al* (2002) simulate the impact of trade liberalisation in Zimbabwe and show an overall increase in aggregate income of four per cent. They show a marked increase in exports and imports but also show a potential negative impact on equity from trade liberalisation alone. They show more gain to the large-scale sector, since the smallholder sector is not heavily involved in exports. This also indicates a vent for surplus which smallholders can exploit, provided they are able to acquire the skills and capital. Since the study there has been an increase in smallholder participation in export crops, particularly cotton, horticulture (especially paprika), groundnuts for export and tobacco.

These emerging smallholder commercial farmers are being negatively affected by the control of the exchange rate and by the sharply appreciating RER. Mehlum (1998) shows that the short-term consequences of devaluation negatively affect unskilled workers real wages but as most of these effects have already been transferred through the black market for foreign currency, the short-term consequences will be lower. The impact will primarily be felt through fuel and electricity prices which have been determined at the official exchange rate. Moving the exchange rate to equilibrium is an

essential condition for re-establishing macroeconomic stability, but it will not be effective without a secure environment for investment and export expansion.

Policies to Promote Rural Development

Transforming the economy requires active steps to promote competition in order to allow prices to effectively allocate resources. Lower transaction costs, access to finance and access to vehicles and processing equipment appropriate for small enterprises, are essential to the successful transformation of Zimbabwean agriculture and rural industrialisation. Agriculture is the backbone of rural development. In order for it to achieve this, however, the multiplier effects from agriculture need to remain in the rural areas. There are strong multiplier effects from smallholder growth which justify investment in infrastructure, research and training to service this sector.

Physical Infrastructure develops in response to increasing man-land ratios and economic activity. Africa's widely dispersed population, low productivity and low literacy levels combine to make it unattractive for private sector investment in infrastructural investment. Without the infrastructure it is difficult to improve productivity and incomes. Specialisation within communities and between communities leads to increased output but is only possible with communication. A market economy is only as efficient as the communications network (transport and information) allows it to be. Well-integrated markets that reduce market risk also require effective storage and exchange systems with competition and low transaction costs. Access to safe water, education, health, veterinary, research, extension, commercial and financial services are all affected by communications, particularly roads. Energy also plays an important role in sustainable growth and in access to communications. In many remote areas electrification is not a viable option, making research into solar energy more urgent as an option for providing both heat and power.

Effective liberalisation of regulations should encourage private sector participation in providing infrastructure in the areas where private returns are high, thus releasing government funds for investment in the marginal areas. The priorities for government investment need to be determined and supervised at local level to ensure that they service the needs of rural communities. The resources and responsibility should be

devolved, with adequate checks to reduce opportunities for rural elites to appropriate the resources and power for personal or political gain.

Capacity to utilise the natural resources and the infrastructure provided underlies the success of the investment. Education and health standards declined markedly in Zimbabwe in the 1990s, particularly in rural areas. The loss of skilled health and education professionals will make it particularly difficult to regain 1980 levels in rural areas. It may be even more necessary to increase access to modern technology to fill the information and knowledge gaps and to encourage a more systematic integration of traditional and Western medicine to address health. This is particularly urgent in view of the Aids pandemic and its impact on poor rural communities.

Technological advances and the importance of indigenous science were both highlighted above and the research services need to direct resources to technologies appropriate to smallholders but which take account of the new market realities.

There is a strong case for high levels of government investment in these activities directed at the poorer strata of smallholders in the poorer natural regions. Returns to such investment will be high in both growth and equity terms since they have received so little investment in the past. If there is massive resettlement of small-scale commercial farmers and subsistence farmers in the higher rainfall areas, there is also a strong case for the adaptation of technologies to address the needs of emerging farmers. These services are effectively public goods since they will contribute directly to economic growth and equity by providing the basis for these farmers to improve productivity. The returns to investment in commercial agriculture in the mid 20th Century were significant and there is now a very strong case for investment in research suited to smallholder farmers in both the high and low-rainfall areas.

An economically viable system of providing financing for agriculture must be put in place. If resources are available, government could subsidise one-time medium to long-term finance for capital expenditure and land purchases. It is important to avoid subsidising short-term credit to avoid a dependency syndrome and undermining the emergence of local financial institutions. Chisvo, 1998, shows that the savings club movement in Zimbabwe successfully mobilised savings in rural areas and have nurtured a savings and credit culture within rural communities while providing insurance and

reciprocity in times of need. The lack of social cohesion may make this approach inapplicable in the resettlement areas. Private banks have been successful in providing small loans to cross-border traders and the success of commercialised credit in Uganda to individual rural entrepreneurs and small farmers highlights the potential for mobilising the private sector in the provision of credit where high repayment rates reduce the costs of high overheads.

Enabling environment

In order to promote agribusiness, non-farm employment and environmental sustainability in rural areas, the institutions, governance and macro-economic conditions need to encourage the participation of small enterprises and provide the right signals to encourage investment in their resources. Access to local and international markets needs to be expanded and measures taken to increase the security of these markets. Foreign currency must be available for the importation of equipment and machinery for small enterprises and government should establish a trade regime which reduces tariffs on vehicles and equipment necessary for processing and marketing agricultural and rural commodities.

Latin American experience indicates that despite the selective modernisation of agriculture and increasing social differentiation, the emergence of greater civic participation in economic and social affairs has had a positive impact on development. "..an explosion in the number of producer, grassroots and non-governmental organizations" have opened opportunities in responding to globalisation while preserving local culture and community relations. These organisations play an important role in lobbying government, servicing the informal rural sector and small farmers and as advocates for human rights and environmental protection (de Janvry *et al,* 1997 p34).

CONCLUSION

There is still a major role for government in promoting agricultural growth, environmental integrity and equity in Zimbabwe. The government needs to provide the institutions which will encourage sustainable investment (secure and flexible property rights) and which will encourage competition (reduce barriers to entry and transaction

costs). The government needs to provide a macro-economic environment that encourages import substitution and exports, reducing inflation and increasing employment. The government needs to encourage investment in communications infrastructure and the dissemination of market information. The government also needs to provide the poorest sectors of the population with access to basic health and education and to invest in developing the skills, information and knowledge for Zimbabwe to participate actively in the global economy.

Of particular importance to agriculture is that Government ensure that there is a high level of investment in agricultural research, extension and access to input and commodity markets. Rural development needs to broaden resource use so that communities are involved in more specialisation and capturing more of the multiplier effects from their activities. They need to expand the services offered in rural areas and invest in agro-processing, the marketing of indigenous commodities and marketing the environmental services offered locally, nationally and internationally.

POSTSCRIPT

The changes to the agricultural sector (1999-2003) make it even more important for government to establish secure and effective institutions and to invest in capacity-building, research and communications. It needs to release smallholder potential by developing an enabling environment for expansion. It is important that the short-term crises do not prevent investment in long-term viability. Policies to promote food production need to take into account comparative advantage and expanding the informal food distribution network. In order to encourage production of export commodities it may be necessary to encourage partnerships and strategic alliances as the new A2 farmers and the smallholders have limited experience with these commodities. This will help to raise capital and provide expertise, but will reduce the independence of the new farmers.

A renewal of agriculture in Zimbabwe will require assistance directed to resource users and not central government. Scarce resources need to be directed (by those most affected) to their best options and there needs to be innovation in establishing institutions that reduce opportunities for rents and patronage.

There will be the need for massive investment in capacity building. An adaptation of "hedge schools" may be appropriate, where trainers move from community to community providing instruction and advice at regular intervals. These "field days" could be coincided with the provision of other health and veterinary services so that communities are able to expand their exchange systems and develop periodic markets, similar to those in West Africa. It would also reduce the transport costs of providing the services. Every effort needs to be made to encourage the emergence of rural traders and small-scale manufacturing so that the multiplier effects of increased agricultural production are captured in the rural areas.

The new A2 settlers, who may receive the majority of the land appropriated, will also require training and an enabling environment. They will need the ability to subdivide and sell land in order to generate the capital needed to farm productively. An effective land market will encourage investment in both environmental integrity and productivity. Central government will not have the capacity to enforce environmental safeguards and local institutions will take time to develop. It is, therefore, essential to ensure that, as far as possible, individual incentives promote sustainable land use. A land tax system will be needed to reduce land-holding for speculative purposes.

The food crisis affects some 7.2 million people in urban and communal areas and a further 1 million former farm workers in addition to most of the farmers settled in 2002 who had inadequate seed, fertiliser and tillage to produce (FEWSNET report February 2003). All these people require access to food aid in early 2003 and will require support again by mid to late 2003. Over one million tonnes of imports are predicted for 2003/4. Zambia and Malawi expect to be self-sufficient which may make it easier to source maize imports and to obtain greater priority from the World Food Programme. The long-term future of Zimbabwe would be negatively affected, however, if all policies and resources are directed to resolving the food shortages. Policies and institutions should also put in place providing incentives and opportunities for the new farmers to take advantage of globalisation.

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