ReSAKSS SA Southern Africa
Regional Strategic Analysis and Knowledge Support System
FACILITATED BY IFPRI | A PROGRAM IN SUPPORT OF CAADP IMPLEMENTATION

ReSAKSS Working Paper No. 26

February 2009

Trends and Spatial Distribution of Public Agricultural Spending in Zambia: Implications for Agricultural Productivity Growth

Jones Govereh
Emma Malawo
Tadeyo Lungu
Thom Jayne
Kasweka Chinyama
Pius Chilonda

Regional Strategic Analysis and Knowledge Support System (ReSAKSS)

ReSAKSS Working Paper No. 26

February 2009

Trends and Spatial Distribution of Public Agricultural Spending in Zambia: Implications for Agricultural Productivity Growth

Jones Govereh
Emma Malawo
Tadeyo Lungu
Thom Jayne
Kasweka Chinyama
Pius Chilonda

About ReSAKSS

The Regional Strategic Analysis and Knowledge Support System (ReSAKSS) is an Africa-wide network of regional nodes supporting the Common Market of Eastern and Southern Africa (COMESA), the Economic Community of West African States (ECOWAS), and the Southern African Development Community (SADC), in collaboration with the International Food Policy Research Institute (IFPRI) and the Africa-based centers of the Consultative Group on International Agricultural Research (CGIAR), to facilitate the implementation of the AU/NEPAD's Comprehensive Africa Agriculture Development Programme (CAADP).

The ReSAKSS nodes offer high-quality analyses to improve policymaking, track progress, document success, and derive lessons for the implementation of the CAADP agenda. ReSAKSS is jointly funded by the United States Agency for International Development (USAID), the UK Department for International Development (DFID), and the Swedish International Development Cooperation Agency (SIDA). The nodes are implemented by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the International Institute of Tropical Agriculture (IITA), the International Livestock Research Institute (ILRI) and the International Water Management Institute (IWMI), in collaboration with regional and national partners.

About the Working Paper series

The goal of the ReSAKSS Working Paper series is to provide timely access to preliminary research and data analysis results that relate directly to strengthening ongoing discussions and critical commentaries on the future direction of African agriculture and rural development. The series undergoes a standard peer-review process involving one reviewer either from within the ReSAKSS network of partners or from an external organization. It is expected that most of the working papers eventually will be published in some other form and that their content may be revised further.

For more information, contact:

Coordinator
Regional Strategic Analysis and Knowledge Support System, Southern Africa (ReSAKSS-SA)
Private Bag X813
Silverton 0127
Pretoria, South Africa
Telephone: +27 (0)12 845 9100
Facsimile: +27 (0)12 845 9110
E-mail: resakss-sa@cgiar.org
www.sa.resakss.org

The authors

Through December 31, 2009 Jones Govereh was a Visiting Assistant Professor in the Department of Agricultural, Food, and Resource Economics, Michigan State University (MSU). He is now the Senior Policy Coordinator for Africa Agriculture Marketing Commodity Programme in COMESA, Lusaka, Zambia. Other authors: Emma Malawo is Deputy Director Policy and Planning, Zambia Ministry of Agriculture; Tadeyo Lungu is a Research Associate with Food Security Research Project; Thom Jayne is a Professor of International Development Department of Agricultural, Food, and Resource Economics, Michigan State University; Kasweka Chinyama is a Research Assistant with the Zambia Food Security Research Project; and Pius Chilonda is Coordinator, Regional Strategic Analysis and Knowledge Support System, Southern Africa (ReSAKSS-SA).

Acknowledgements

The Food Security Research Project is a collaborative program of research, outreach, and local capacity building, between the Agricultural Consultative Forum, the Ministry of Agriculture and Cooperatives, and Michigan State University's Department of Agricultural Economics. This paper is co-published in collaboration with the Southern Africa Regional Strategic Analysis and Knowledge Support System for Southern Africa (Re-SAKSS-SA)

We wish to acknowledge the financial and substantive support of Re-SAKSS-SA, the Swedish International Development Agency and the United States Agency for International Development in Lusaka. Research support from the Global Bureau, Office of Agriculture and Food Security, and the Africa Bureau, Office of Sustainable Development at USAID/Washington also made it possible for MSU researchers to contribute to this work.

The views expressed in this document are exclusively those of the authors. Comments and questions should be directed to the In-Country Coordinator, Food Security Research Project, 86 Provident Street, Fairview, Lusaka: tel: 234539; fax: 234559; email: fsrp@coppernet.zm

Govereh, J.; Malawo, E.; Lungu, T.; Jayne, T.; Chinyama, K.; Chilonda, P. 2009. *Trends and Spatial Distribution of Public Agricultural Spending in Zambia: Implications for Agricultural Productivity Growth***.** ReSAKSS Working Paper No. 26. International Crops Research Institute for the Semiarid Tropics (ICRISAT), International Food policy Research Institute (IFPRI) and International Water Management Institute (IWMI).

The previous version of this paper was published as FSRP Working Paper No. 36, Food Security research Project, Lusaka, Zambia and is also available for download at- **http://www.aec.msu.edu/agecon/fs2/zambia/index.htm**

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

DRC	Democratic Republic of Congo
CV	coefficient of variation
AEZs	agro-ecological zones
MACO	Ministry of Agriculture and Cooperatives
FRA	Food Reserve Agency
GMO	Genetically modified organism
ARCH	Autoregressive Conditional Heteroskedastic
MSU	Michigan State University
Re-SAKSS-SA	Southern Africa Regional Strategic Analysis and Knowledge Support System for Southern Africa
FSRP	Food Security Research Project
USAID	United States Agency for International Development
Sida	Swedish International Development Agency

EXECUTIVE SUMMARY

OBJECTIVES: This paper assesses the level and composition of the Zambia's public expenditures in the agricultural sector from 2000 to 2008. By measuring the size of public agricultural expenditures, the study will answer whether the Government of Zambia met CAADP's target of allocating 10% of national budget to agriculture in 2008. Furthermore, examining what the fund is being spent on will shed light on the extent to which spending contributes to agricultural growth. This review will also characterize the spatial patterns of expenditures across provincial boundaries. The results of this work will hopefully lay a foundation for future analysis of the impacts of public agricultural spending on sector performance.

GENERAL FINDINGS; In the last fifteen years, agriculture has emerged as the main pre-occupation for the majority of households in Zambia. Agriculture in Zambia is one of the main contributors to the country's GDP, with a contribution in 2007 estimated at 13 per cent in the primary sector and 9 per cent in the secondary sector (CSO, 2008). The agricultural sector employs two thirds of the population and, therefore, occupies a very strategic position to contribute to economic growth and improved human well-being. More than 65% of the poor are in rural areas pre-occupied with subsistence farming. For these reasons, Zambia's Fifth National Development Plan (FNDP) strategy emphasized the revitalization of agriculture as an engine of economic growth and development.

Unfortunately, the agricultural sector stagnated and continues to do so. Production growth at 1% pa is too low to sustain a population growth of 3% and is far off the CAADP target of 6%. There is a general loss of productivity in the rain-fed crop systems, livestock and fisheries. The low productivity trends are a result of 20 years or so of neglect. The increasing trends in the incidence of poverty in rural areas come as no surprise. And even though Zambia's economy is dominated by copper mining, its food system continues to stagnate. Failure to diversify its economy in general and lack of agricultural investments in particular have choked off the process of structural transformation. Rural incomes remain low and living standards and nutrition poor. However, unlike the growth in other sectors, agricultural led growth in Zambia provides the largest benefits for the poorest population and reduces inequality (Thurlow and Wobst, 2006).

What is required to get agriculture moving in Zambia is for the government to adequately fund public agriculture institutions, infrastructure and provide an enabling agriculture policy environment. Smallholder oriented and high quality agricultural research, wide coverage of support services and strong and steady commitment to develop rural agricultural infrastructure, such as irrigation, roads and power, is indispensable to creating broad-based agricultural growth. All of these public goods investments played an important role in the agricultural-led structural transformation processes in Asia and other continents.

SPECIFIC FINDINGS:

1. Low productivity is partially attributed to misplaced spending priorities. There is a general lack of proportionality when it comes to agricultural spending. In Zambia, 65% of the total poor are in the rural sector. Yet the share of agricultural spending among donors and the Zambian government is less than 5%.

2. Spending is misaligned as contributions of various sub-sectors to national production are not matched with spending allocations. Forestry is a significant contributor to economic growth yet it gets low allocations relative to its economic contribution. The allocations are not going to programs with high returns for growth and poverty reduction. Programs with high returns for growth seemingly are given lower priority than politically expedient programs. Public agricultural expenditure issue is more about priorities rather than limited resources. Fulfilling the CAADP commitment is necessary but it is insufficient to rescue agriculture from the slumber. The same amount of resources if spent efficiently can do more than otherwise. Public expenditure policy to support cassava, fisheries, and livestock sub-sectors is weak.

3. Public agriculture poverty reduction programs have wholly been about subsidizing less than 10% of the farm population. Public agricultural infrastructure investment has been sidelined. There is limited evidence that the subsidies are effective. Public spending on maize subsidies have increased but the sub-sector performance has not shown any corresponding additional change. Maize area, yields and output have remained stagnant. It is doubtful under these conditions that agriculture's public budget gives value for money.

4. Agricultural infrastructure and public services (research and extension) is poor and it is getting worse. More investment is needed yet public and donor funding is decreasing. Since the introduction of austerity measures, agricultural infrastructure investment became difficult to justify and short term expenditures became easier to implement. Despite the commitment to increase agricultural expenditures, structural difficulties to increase public agricultural investment abound. There is also unbalanced composition of RDCs versus emoluments. The effectiveness of agricultural research and extension services is adversely affected if wage share exceeds 60%. Between 2000 and 2008, Zambia has averaged 70%. Relative scarcity in RDCs has resulted in poor service delivery.

5. It appears that the uneven distribution of PAE is simply driven by the production system. Maize production and consumption zone receives more government spending than the cassava zone. High fertilizer allocation and maize purchase rates in the most infrastructure endowed maize zones does not add to total service but increases the degree of regional polarization. Concentration of PAE in the cassava belt will crowd-in private investment and counterbalance private investments and spending in the maize belt. Counterbalancing PAE which transfer funds to the least endowed provinces minimizes the degree of provincial polarization.

6. Financing agricultural development is fraught with structural difficulties. Being an economic sector, government is not involved in farming and marketing agricultural produce in the same way it is involved in social sectors. In health and education sectors, government is central to execution. Much of the increase in public spending in Zambia has been achieved by boosting the expenditure lines that have a strong social orientation, ie., input and marketing subsidies. These programs have a social and political appeal and are fashionable to decision makers. Boosting the economic aspects of the agriculture budget will require new thinking.

IMPORTANT RECOMMENDATIONS;

7. The how and what of agricultural development financing is a negotiating process. The budget is a political matter which is in the hands of government. The process is a means of sharing power. The budget that comes out is often a reflection of the negotiating process among power players. A budget that fails to address structural rigidities of the sector is weak

suggest weak sector leadership. The strength or weakness of agriculture in the negotiation process depends on where agriculture is positioned within Cabinet. There are several ministries and those that have positioned themselves higher than others in Cabinet will find negotiating for more resources easier than others.

8. The role of other stakeholders in budget negotiation is very important. To get Cabinet commitment, agriculture will require networking with others at all levels. Farmer organizations, consumer associations, media houses, civil society, opposition and ruling party parliamentarians should all be part of this network. Agricultural leaders should use these networks to explain FNDP priorities, CAADP and EPA programs. The Ministry of agriculture also needs to build alliances with Ministry of Finance and State House. Agriculture can use these alliances to explain and give background to proposed budget lines. These networks play an important advocacy role during budget negotiations and formulation process.

9. To attract 10% of total public funding, the agricultural sector needs data and knowledge systems that make the objectives and outcomes very clear and convincing to the Minister of Finance. If Ministers of agriculture cannot define a clear vision for the sector, it becomes difficult to win Cabinet commitment of resources. Quality data could strengthen the position of agriculture in the budget process. Performance variables such as yield and output are difficult to guarantee because they depend on rain and quality of season. The Ministry of agriculture needs capacity in public expenditure reviews and policy analysis. Staff should be able to analyze the income raising and poverty reducing impacts of PAE using household level data. Besides, benefit-cost-incidence analysis is needed to show how effective programs are in targeting households. MACO needs to put up a good plan of action and demonstrate how agriculture contributes to solving political problems, such as, poverty and hunger. This requires investment in data generation.

10. Greater attention is needed on improving the quality and availability of data on the impact of spending. Data on the effectiveness of agricultural expenditures can be helpful in negotiations. Expenditure surveys could demonstrate how much of the resources spent reach those that it is intended to reach. Evidence of achieving the intended outcomes is helpful in showing how effective PAE are.

11, The treasury needs to be convinced that the sector can do what it has planned or targeted. Furthermore, agriculture should have capacity to absorb resources allocated. High outturns are desirable. The sector will not convince decision makers to allocate additional resources if the sector is failing spent what is budgeted.

12. Infrastructural investments have both complementary and synergistic effects within agricultural development. Investment expenditure needs sequencing and joint implementation. If roads are built first and R&D later, the rate of return for each investment will change if the sequence changes. Capturing the synergistic effects over time is difficult to express but it is easier to do this over space. Regardless of this difficulty and limited resources, the time order of agricultural investment is important and decisions have to be made on what investment will be implemented first.

13. Rate of return analysis is helpful but it is far fetched and very country specific. Given the not so good current state of knowledge, this paper cannot recommend investment choice in Zambia based on analysis done in other countries. The effects of various investments are a function of the policy setting. The alternative is to figure out what is the most binding constraint.

14. Expenditure analysis should analyze who benefits from the current distribution of resources. Regional disparities exist in Zambia. Investment in high potential areas may give the highest returns but accentuate inequity and social injustice. The challenge is how to target investment to maximize rate of return and equitable distribution of net benefits.

15. Finally, there is need for guidance to agricultural departments on appraising proposals for policies and projects. It is not enough that a proposed policy contributes to agreed objectives, unless there is consideration first of (a) better ways of achieving the objective and (b) better uses for the resources required. Markets should be left to function freely without interference unless there is some identified "market failure" or equity objective. It might still be possible to bring about some kind of non-public sector solution to problems identified by policy analysis.

1. INTRODUCTION

1.1 Background to PAE

Agriculture's contribution to Zambia's GDP in 2007 was estimated at 13 per cent in the primary sector and 9 per cent in the secondary sector (CSO, 2008). Agriculture also employs two thirds of the population and, therefore, occupies a very strategic position to contribute to economic growth and improved human well-being. More than 65% of the poor are in rural areas pre-occupied with subsistence farming. For these reasons, Zambia's Fifth National Development Plan (FNDP) strategy emphasized the revitalization of agriculture as an engine of economic growth and development.

Getting agriculture moving has been a necessary condition for overall economic development in Asia, North America, and Europe. The agricultural system in these continents moved away from subsistence orientation to an integrated system based on greater specialization and exchange. Even though Zambia's economy is dominated by copper mining, its food system continues to stagnate. Failure to diversify its economy in general and lack of agricultural investments in particular have choked off the process of structural transformation. Rural incomes remain low and living standards and nutrition poor. Thurlow and Wobst (2006) show that compared to copper-led and non-agriculture-led growth, agricultural led growth in Zambia provides the largest benefits for the poorest population and reduces inequality. The growth linkages of the agricultural sector with non-agricultural sectors are what make agricultural led growth in Zambia pro-poor.

Historical experience and economic theory show that positive agricultural growth and poverty reduction effects are associated with increased public agricultural expenditures (Mellor 1976). The large reductions in poverty levels recorded in the modern history of England, India and China started with increased productivity among smallholder farmers (Lipton, 2005). In 2003, African Heads of State and Governments, farmers, agribusiness, NGOs and development partners agreed to adopt sound policies to support Comprehensive African Agricultural Development Program (CAADP) and committed to allocating at least 10% of national budgetary resources for their implementation by 2008 (AU/NEPAD, 2006).

What is required to get agriculture moving in Zambia is for the government to adequately fund public agriculture institutions, infrastructure and provide an enabling agriculture policy environment. Smallholder oriented and high quality agricultural research, wide coverage of support services and strong and steady commitment to develop rural agricultural infrastructure, such as irrigation, roads and power, is indispensable to creating broad-based agricultural growth. All of these public goods investments played an important role in the agricultural-led structural transformation processes in Asia and other continents. The stalled structural transformation process in Zambia is what motivates the examination carried out in this paper of how Zambia's government spends its money in agriculture.

1.2 Objectives

This paper assesses the level and composition of the Zambia's public expenditures in the agricultural sector from 2000 to 2008. By measuring the size of public agricultural expenditures, the study will answer whether the Government of Zambia met CAADP's target of allocating 10% of national budget to agriculture in 2008. Furthermore, examining what the fund is being spent on will shed light on the extent to which spending contributes to agricultural growth. This review will also characterize the spatial patterns of expenditures

across provincial boundaries. The results of this work will hopefully lay a foundation for future analysis of the impacts of public agricultural spending on sector performance.

In recent years, public agriculture expenditure (PAE) analysis has received increased attention. This is in recognition of the important role public agricultural expenditures play in influencing agricultural sector performance. Public expenditure review is useful in setting of policy priorities, explaining the role of the state in the sector and how effective that role is performed (Cabral, 2007).

1.3 Outline of Report

This paper is organized into seven sections. The section following the introduction describes the sources of public agricultural expenditure (PAE) data and the methods used to analyze this data. Section 3 looks at the residence of Zambia's population, its participation in agricultural activities and the performance of smallholder crop production. The section that follows describes the real size, the proportion of national budget and the intensity of PAEs. Section five disaggregates PAE by looking at the functional composition of the agricultural budget and assesses the potential impact of spending allocations. Section six looks at the spatial distribution of PAE in Zambia's nine provinces in relation to where farmers are settled, where maize is produced and where poverty is severe. The final section gives a summary of the paper and a few recommendations.

2. DATA AND METHODS

2.1 Data sources

To track the performance of the agricultural sector, Post Harvest Survey (PHS) data was used. PHS is conducted annually by Central Statistical Office (CSO). The general objective of PHS is to provide annual agricultural data that helps to facilitate comprehensive analysis of the agriculture sector's performance, its contribution to the national economy and assist in the design of interventions by government and NGOs (CSO, 2004). PHS data available for this study starts from the 1990/91 and ends in 2005/06 agricultural season.

Data on public expenditure for agriculture was obtained from government "Financial Reports" published annually by Ministry of Finance and National Planning (MFNP). Use of centralized records of expenditure was more convenient than working from individual spending agent records. Records shown in the financial reports distinguish between approved spending (appropriations), released/authorized spending and audited spending. This study used audited accounts to measure actual agricultural spending between 2000 and 2006. "Estimates of Revenue and Expenditure" published annually by MFNP (commonly known as the "Yellow Book") provided expenditure appropriations for 2008 and released spending for 2007. The latest financial report published in 2008 by the Auditor General's office covered 2006 accounts.

2.2 Method of expenditure tracking and analysis

2.2.1 Smallholder production performance

The PHS data was used to measure crop output growth as well as partial factor productivities. The rate of growth is measured at an instantaneous rate of the exponential function Ae^{rt} (Chiang 1984). The rate of growth r of crop output is simply the rate of change in output expressed in relative terms. Therefore, the rate of change in crop output is calculated per period t which is a year. The instantaneous rate of growth is a constant at all points of time between 1990/91 and 2003/04 but the absolute amount of increment or decrease in output changes within the period.

In this report, we use two measures of partial factor productivity: (1) crop output per unit of area cultivated, which is a partial measure of land productivity; and (2) crop output per agricultural household (a partial measure of labor productivity in the agricultural sector). Ideally, total factor productivity (TFP) approaches are preferable, but PHS collects data on the use of selected factors of production (land and capital).

Given that PHS estimates measure production in physical volumes, a suitable approach to standardize the value of individual crops to allow aggregation across all crops was developed. This involved constructing an average constant price for each crop commodity. The product of the constant price and the quantity produced for each commodity for each year gave an indexed value of output for each crop. For a particular crop, the indexed value is what would be gross value of output if prices did not change across years and if the price used happened to be the average price over the period. Indexed values of different crops were now comparable and their contribution to the total physical output could be easily assessed. The indexed values reported here are not the values in the usual way value is calculated.

2.2.2 Expenditure tracking and analysis

This study tracked public agricultural expenditures funded through fiscal disbursements and external loans and grants. Zambia's national budget cycle runs concurrently with the calendar year. Coverage for this study started from 2000 and ended in 2008.

To develop national public agricultural expenditure accounts, decisions had to be made on what types of spending to include. The definition of agricultural expenditure that this paper adopts is guided by literature and a prior methodology paper the authors of this paper developed for southern Africa's Regional Strategic Analysis and Knowledge Support Systems (ReSAKSS - SA) in 2007. Agriculture was defined by the Africa Union's (AU) New Economic Partnership for Agricultural Development (NEPAD) to include crops, livestock, fisheries and forestry activities ranging from: administration of commodity affairs and services; operation or support programs or schemes; production and dissemination of information; compensation, grants, loans or subsidies; administration and operation of government agencies engaged in research activities (AU/NEPAD, 2006).

This expenditure tracking exercise follows the AU/NEPAD's approach which is based on the classification of functions of government (COFOG) developed by the organization for Economic Cooperation and Development (OECD). According to this classification, national public agricultural expenditures encompass all spending for activities whose primary purpose is to **restore, improve and maintain** agriculture during a defined period of time (IMF, 2006). All such public expenditure regardless of the public institution or entity providing for the agricultural activity was counted. Food purchase expenditures by government from domestic or external markets are included as agricultural expenditures even though they are remotely related to agricultural development. Readers are referred to the methodology paper for a detailed explanation of what is included in the definition of agricultural expenditure.

The framework for expenditure accounts focuses on how funds flow from originators of the funds to recipients or funded/spending agents and then to service providers (De, S.; T. Dmytraczenko; C. Chanfreau; M. Tien; G. Kombe, 2004). The size of spending can either be measured at source or at the spending agent stage of the fund flow. Irrespective of where the measurement is done, what is spent by a recipient should be equal to the funds provided by the source. In this paper, agricultural expenses are measured at the spending agent stage of the flow. This allows expenditure data to be gathered in a disaggregated form which in turn allows reclassification of the expenditures by functions and by their economic uses.

In Zambia, funds for agricultural spending come from various sources. Sources of funding for agriculture spending can be categorized into two broad areas, that is, external versus domestic resources. External funding comes from International Finance Institutions; bilateral donors; emerging donors from the East; commercial sector; and private foundations (FAO, 2007). Domestic funding comes from the national treasury though tax revenue and private investment (commercial loans and farmer equity). This paper's focus is on domestic public agricultural funding from fiscal disbursements by government and basket loans and grants from external sources. Therefore, what is being tracked is only a sub-set of the total national agriculture expenditure accounts.

Funds from these various sources are paid out to more than one ministry or spending agent. Agricultural sector's frontline-ministry in Zambia is Ministry of Agriculture and Cooperatives (MACO). MACO performs purely agricultural roles and is considered a "take-all" ministry as regards public agricultural expenditures. In addition, there are agricultural

expenses that appear in the accounts of "partial-budget" ministries who perform agricultural activities indirectly while implementing their mandated functions. The "partial budget" ministries in Zambia include Finance and National Planning, Energy and Water Development, Works and Supply, Community Development and Social Services, Lands, Environment, Tourism and Natural Resources and Ministry of Defense. Table 1 shows the principal financers; the Ministries, Provinces and Spending Agents (MPSAs); and the types of services and benefits provided. Special attention will be given to the "partial-budget" group spending to allow separation of agricultural expenditures from non-agricultural expenditures.

Table 1: Zambia's public financial profile for agricultural sector: financial sources, financing agents and services

Ministries, Provinces & Spending Agents (MPSAs)	*Primary Funding Sources*					*Service provided*
	Ministry of Finance	Donors	Local Gov	Co-Pay	International Loans	
Ministry of Agriculture[1]	X			X	X	Research, extension, training
Ministry of Environ & Tourism	X				X	Research, extension, training
Ministry of Education	X			X		Training agric scientists
Ministry of Community Dev	X					Agriculture welfare agencies
Ministry of Finance	X	X				Agric development projects
Ministry of Works & Supply	X				X	Roads on farming blocks
Ministry of Water & Energy	X				X	Dams & Electricity
Ministry of Lands	X					Land surveys in farm blocks
Office of the Vice-President	X	X				Agric disaster management
Provincial Government	X	X				Agric development projects
Local Government	X	X	X			Agric development projects
Major use of each funding source	Operations	Capital assets	Infrastructure	Inputs	Infra structure	

[1] agriculture covers crops, livestock and fisheries

Source: Govereh et al, 2007

Table 1 also shows the major use of funds from each primary financer. Not only does the financing profile provide the relationship between financing and service delivery roles, it also provides direction to sources of information, to data repositories, and to the main actors in the agricultural sector.

Once the expenditure data was tracked, trends of total spending in constant values were analyzed. Growth rate of spending was also estimated. The trends in the share of the national budget spend on agriculture and the intensity of spending was also developed. The intensity of spending gave an indication of how much government spends for each kwacha of agricultural output.

The disaggregated nature of the data allowed the study to conduct a core function analysis. This involved identifying core programs of funding and then establishing a match or mismatch with the composition of the budget. Analysis was also done to investigate the nature of the balance across economic expenditure classes as well as functional classes. Finally, provincial variation in public agricultural spending was assessed using only those expenditure programs that were allocated to specific districts or provinces. These expenditures were indexed and comparisons made to assess whether the patterns were driven by equity or growth considerations.

2.3 Limitations of the study

The source of the funds this review focuses on is fiscal revenue plus basket funding from cooperating partners. Spending by cooperating partners through projects outside the budget are significant but will not be addressed in this paper. Spending by the private sector through foreign direct investments, domestic loans and own farmer equity is not covered in this paper. Such work will be the subject of future studies. This study covers only a subset of Zambia's national agriculture expenditure accounts.

Government Financial Reports have changed formats midstream. Prior to 2006, public expenditure was reported using economic expenditure classes. Since 2006, expenditure was reported using the functional classification. These changes made it impossible to perform trend analysis at a disaggregated level by either economic or functional classification for the entire nine-year period.

Ministry of Agriculture and Cooperatives is not the only spending agent of PAEs in a given financial year. Data had to be captured from other spending agents in order to come up with total PAE. Separating agricultural related spending from partial-budget spending agents was difficult. For example, spending on water and dam construction by the Ministry of Water and Energy impacts on agriculture but was not included if the primary purpose of the construction was not for irrigation.

Furthermore, the switching of responsibilities over government programs from one spending agent to the other made it difficult to track such spending across years. For example, responsibility over spending for the Nitrogen Chemicals of Zambia switched from Ministry of Commerce Trade and Industry to Ministry of Agriculture and Cooperatives. Spending for a number of agriculture related programs or for food reserve imports is in some years appropriated under the Ministry of Finance and National Planning but in other years it is in the Ministry of Agriculture and Cooperatives. Without full knowledge of these changes, it is difficult to cover spending adequately.

3.0 POPULATION AND CROP PRODUCTON TRENDS

This section discusses changes in the distribution of household population by residence as recorded in 1990 and 2000 censuses and household participation in agriculture. The section also reviews the general performance of the agricultural sector especially crop productivity of smallholder farmers.

3.1 Population distribution of households and agriculture

Between 1990 and 2000, the number of households in Zambia increased by 76%, Table 2. But the number of rural household increased more than urban households, that is, 90% versus 54%. The factors that pushed people from urban areas or pulled people to rural areas between 1990 and 2000 have not been clearly identified.

Table 2: Census of households by residence and engagement in agriculture, Zambia, 2000

Households	1990 Census		2000 Census		% change
	Count	*Column %*	*Count*	*Column %*	
Agricultural	520,520		1,305,783		150
Rural	510,362	48	1,084,637	57	112
Urban	10,158	1	221,110	12	2076
Non-agricultural	549,494		578,958		5
Rural	141,434	13	156,861	8	11
Urban	408,060	38	422,097	23	3
Rural	651,796		1,241,534		90
Urban	418,218		643,207		54
Total	1,070,014	100	1,884,741	100	76

Source: Census 1990 and 2000, CSO, Zambia

Between 1990 and 2000, the number of agricultural households increased very rapidly, by 150%, while non-agricultural households only increased by 5%, Table 2. In 1990, only 48% of all households were engaged in agriculture. By 2000, 69% of all households in Zambia were engaged in agriculture. The increased engagement in agriculture was probably driven by the loss of employment in mining and the increase in the real price of consumer staples following the withdrawal of food subsidies. Table 2 also shows that the proportion of rural residents not engaged in agriculture declined from 13% in 1990 to 8% in 2000. The proportion of urban farmers increased from 1% in 1990 to 12% of the total households in 2000. Agriculture has emerged as the main pre-occupation for the majority of households in Zambia. When most economic sectors fail or collapse, agriculture provides the economic refuge.

3.2 Aggregate performance of agriculture sector

Table 3 shows that between 2000 and 2007, the agricultural sector did not perform well. Agricultural output was very unstable during the eight-year period. This unstable

performance was observed in crops, livestock and fisheries sub-sectors. Smallholder crop production is mainly rain-fed. The excessive mid-season droughts in 2001, 2002 and 2005 resulted in bad harvest. The contribution of livestock to the economy has been restricted by poor access to markets. The smooth marketing of livestock has not occurred because of disease control measures meant to reduce the spread of Foot and Mouth Disease (FMD), Contagious Bovine Pleuro-pneumonia Disease (CBPP) and East Coast Fever (ECF). Output in the fisheries sub-sector declined consistently between 2000 and 2004, Table 3. Only the forestry sub-sector registered consistent growth in output during the period under review.

Table 3: Annual Change & Share of Agricultural Gross Domestic Product (GDP) by Economic Activity – Constant 1994 prices

Agricultural Economic Activity	2000	2001	2002	2003	2004	2005	2006	2007
	Annual change in GDP							
Primary Agriculture Sector	1.6	(2.6)	(1.7)	5.0	4.3	(0.6)	2.2	1.9
Crops and livestock	1.0	(6.0)	(6.3)	8.0	6.1	(4.0)	3.0	(0.6
Forestry	4.0	4.3	4.3	4.3	4.3	3.6	1.4	5.2
Fishing	(1.0)	(5.0)	(0.7)	(0.7)	(0.7)	0.5	1.8	1.8
Secondary Agriculture Sector								
Food, beverages & tobacco	0.6	5.3	5.4	8.6	5.8	3.6	8.9	9.3
Textiles and leather	2.2	2.3	6.2	3.2	(1.9)	(2.9)	(1.3)	(16.1)
Wood and wood products	(0.3)	5.7	7.5	11.4	4.2	3.6	0.7	5.2
Total GDP at Market Prices	**3.6**	**4.9**	**3.3**	**5.1**	**5.4**	**5.2**	**6.2**	**5.7**
	Annual Share of GDP							
% of Agriculture's Primary GDP	17.2	16.0	15.2	15.2	15.0	14.2	13.7	13.2
Crops & livestock	8.5	7.6	6.9	7.1	7.2	6.5	6.3	6.0
Forestry	5.4	5.4	5.4	5.4	5.3	5.2	5.0	5.0
Fishing	3.3	3.0	2.9	2.7	2.6	2.4	2.3	2.3
% of Agriculture's Secondary GDP	8.8	8.9	9.0	9.3	9.1	8.8	8.9	8.8
Food, beverages & tobacco	6.2	6.3	6.4	6.6	6.6	6.5	6.7	6.9
Textiles and leather	1.8	1.8	1.8	1.8	1.7	1.5	1.4	1.1
Wood and wood products	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8
Total GDP constant (ZKbillion)	**2499**	**2621**	**2707**	**2846**	**2999**	**3155**	**3351**	**3542**

Source: CSO, National Accounts Statistics, The Monthly – Vol 64

It is important to note that crop and livestock production is a fairly small share of the overall agricultural GDP. Forestry and fishing together contribute a bigger share of GDP than crops and livestock. It seems the distribution of public agricultural spending does not acknowledge the economic contributions of various sub-sectors. The secondary agricultural sector has performed well. Table 3 shows that the food, beverages and tobacco category together with the wood and wood products have performed well. The textiles and leather category slumped consistently in the last four years, Table 3. This slump is largely attributed to the decline in fortunes in the cotton industry. The strengthening kwacha made cotton production less competitive for growers and processors. The resultant cuts in production have reduced ginning capacity and textile exports. The stagnation in the sector means that the much desired structural transformation remains elusive.

The overall share of primary agricultural output in the economy is trending downwards, Table 3. This is in stark contrast to trends in the 90s when primary agriculture's share rose to a peak of 17.5%. The current share declines are in crops, livestock and fisheries sub-sectors. In the secondary sector, the share declines were observed in textile and leather products. The declining contributions from agriculture have a direct negative impact on the welfare of rural residents the majority of whom are engaged in agriculture. If shares had declined but absolute growth registered, it could indicate the presence of economic structural transformation. In this case, no structural transformation took place.

At a time when agriculture was struggling, surprisingly, the overall economy posted growth of more than 5%. The sectors that drove this economic growth are mining and construction. Much of the direct beneficiaries of the mining and construction boom are urban residents. Indeed, the incidence of poverty in urban areas declined significantly from 56% in 1998 to 34% in 2006.

3.3 Crop production and productivity trends

Zambia's agricultural sector is characterized by over 1.1 million small and medium scale households growing a significant proportion of total agricultural output, MACO (2008). Large scale farmers, though fewer, contribute significantly to total area under crops especially for sugar and wheat.

Table 4 shows the not so impressive performance of Zambia's smallholder agriculture. Between 1990 and 2005, crop output growth was miniscule (1%) and sluggish. The target growth under CAADP is 6% pa, Table 4. Population growth is over 3% per annum. With crop output growing at a fraction of population growth rate, it is no surprise that the number of rural poor will continue to increase. Smallholder maize output grew sluggishly at rates much lower than the CAADP maize target of 4.8% p.a. The only sub-sector that has grown close to expectations is cassava. Cotton and more recently groundnut posted improved performance but below desired targets.

Smallholder crop production stagnated because productivity regressed. The marginal growth in output recorded between 1990 and 2005 came as a result of expanded area under cultivation. Smallholder agriculture is still carried out with rudimentary methods and the degeneration of productivity is alarming. Output per unit of area, output per household and area planted per household all regressed during the period under review, Table 4. There is a real cause for concern because productivity is too low to support the expanding population.

Table 4: Growth rates in key agricultural indicators in Zambia, 1990 - 2006

Measure	1990 – 1994	1995 – 1999	2000-2005	1990 – 2005	CAADP 2015 Target
Total crop value	-3.25	1.91	1.31	1.09	6.09
Maize	-0.50	0.66	1.62	0.49	4.84
Cassava	3.30	11.86	3.60	4.33	5.54
Groundnuts	-5.70	1.77	-0.53	2.96	5.35
Cotton	-8.17	-3.88	3.65	3.40	9.37
Crop productivity					
output per ha	-2.95	-0.75	1.42	-0.06	
Output per HH	-4.76	0.27	0.77	-0.42	
Area planted per HH	-1.81	1.02	-0.65	-0.36	

Source: CSO, PHS data

According to Table 5, the incidence of poverty in Zambia declined from 74% in 1993 to 64% in 2006. Despite the decreasing trend in poverty levels, the levels are still high and rate of decline is low. The Millennium Development Goal on poverty is to reduce the level to 35% by 2015. In addition, the incidence of poverty is higher among rural than urban residents. Given that employment opportunities in rural areas are limited, the strong reliance on a declining sector has contributed to increasing poverty levels there. On the other hand, poverty in urban areas has declined. Urban residents are benefiting from job opportunities created by the booming mining and construction sectors.

Table 5: Incidence of poverty in Zambia by region, 1990 - 2006

Region	1991	1993	1996	1998	2004	2006	Average	MDG 2015 target
Urban	49	45	46	56	53	34	47	23
Rural	88	92	82	83	78	80	84	42
Zambia	70	74	69	73	68	64	70	35

Source: CSO, Monthly Report, June 2008

It is clear from this assessment that growth in crop output is far from that needed to allow agriculture drive poverty levels down. Smallholder crop production in particular is in dire need of support if agriculture is going to make a dent on reducing poverty levels. The alarming downward trends in smallholder agricultural performance are related to the type of government interventions. Smallholder farmers need innovations that can help them improve productivity and efficiency. Having access to improved inputs, proven methods, critical knowledge and output markets will lead to productivity improvements.

Insufficient public investment in agricultural research, extension, organization of markets and basic infrastructure interact to consistently constrain smallholder productivity. Given that the private sector cannot capture gains from public investments government has the responsibility to provide these goods to stimulate productivity growth (Haggblade, 2007).

Thurlow et al (2007) found out that if Zambia can achieve large increases in crop yields, it is possible to achieve CAADP target of 6% annual growth. This will not only increase agricultural GDP but reduce poverty levels lower than would have been the case without agricultural growth. Given the stronger non-agricultural linkages, Thurlow et al (2007) encouraged the Government of Zambia to prioritize yield improvements in maize, root and smallholder export crops in order to stimulate broader economy-wide growth and poverty reduction.

It is very clear that even if Zambia would achieve the CAADP growth target of 6 percent, poverty levels are not likely to be halved by 2015. To achieve the MDG1 target, both agriculture and non-agriculture have to grow by 10 per cent (Thurlow et al, 2007). This magnitude of growth is obviously beyond Zambia's resource envelope. Given the poor performance of agriculture relative to mining and construction, it will come as no surprise to identify population shifts towards urban areas.

4.0 TRENDS IN PUBLIC AGRICULTURAL EXPENDITURE

Since section 2 identified the type of expenditures that qualify to be classified as agriculture or agriculture related, this section, proceeds with a trend analysis of aggregate levels of spending. This is done by looking at the real size, the proportion of the national budget and the intensity of PAE. The trends are for the period between 2000 and 2008.

4.1 Real Size of Public Expenditures

Figure 1 shows the contribution of government's discretionary funds and development partner's funds to total public agricultural expenditures. Total public agriculture expenditure (PAE) grew in real terms from ZMK211 billion in 2000 to ZMK1.8 trillion in 2008, Figure 1. The "real" size of PAE grew at an average rate of 10% per annum during the period under review. During this same period, 75% of total PAE, on average, was government's discretionary funds. Fiscal dependence on development partners in agricultural spending declined from 48% in 2000 to 18% in 2008. According to the 2000 to 2008 expenditure trends, GRZ's discretionary and development partner spending in agriculture grew in real terms at 11.2% and 7.5% per annum, respectively.

Figure 1: Trends in Public Agricultural Expenditure by Source, Constant Prices (2008 = 100), Zambia, 2008.

Error! Not a valid link.

Source: 2000 – 2008 Financial Reports and 2007 – 2008 Estimates of Revenue & Expenditure, MFNP, GRZ

The extent to which this increase in national resources allocated to agriculture is a result of increased knowledge about the potential role of agriculture as an engine of pro-poor growth is not clear. The increase could also be explained by a reduction in fiscal constraints following Zambia's HIPC qualification and subsequent debt cancellation. Palanismwamy & Birner (2006) suggest that the size of public spending on agriculture is the outcome of political decisions influenced by interest groups and democratic reforms. Other factors that influence the size of spending include ideas and ideology regarding role of agriculture in economic development and role of state in promoting development. Which of these factors explains the increase in PAE in Zambia?

Zambia has not undergone much political reforms in the past eight years. Even though the rural vote is larger in size, smallholder farmers still do not exercise electoral leverage and vote along ethnic lines rather than economic interest. It appears that growth in public agricultural expenditure between 2000 and 2008 in Zambia was driven by the ideology regarding the role of government in agricultural development. Much of the growth in own spending by GRZ was realized after 2003 when GRZ significantly stepped up spending towards fertilizer subsidies and maize price support. Having stagnated for much of the period, donor spending increased between 2005 and 2007 from ZMK64 billion to ZMK427 billion. This increased funding for agriculture by donors was due to changes in donor thinking about the role of the state in agricultural development. In the 1990s, donor's support was tied to economic reforms. The thinking among key donors has changed and now donors provide untied budget support.

4.2. Agriculture's Share of Government Spending

The trend in agricultural sector's share of the national budget is positive. Agriculture's share rose from 7.4% in 2000 to 12.5% in 2008, Figure 2. At the time of signing the Maputo Declaration in 2003, Zambia was committing 6.1% of its national resources towards agriculture.

Figure 2: Public Agricultural Expenditure Share of Total National Budget, Zambia, 2000 – 2008.

Error! Not a valid link.
Source: 2000 – 2008 Financial Reports and 2007 – 2008 Estimates of Revenue & Expenditure, MFNP, GRZ

This declaration committed Zambia to raise its share of agriculture's expenditure to 10% by 2008. Following this declaration, Zambia's share of national resources going to agriculture rose significantly and surpassed the 10% target set by the leaders of the Africa Union. Zambia is therefore in the company of a few African countries whose share of spending to agriculture is CAADP compliant.

Zambia's push to increase her share of agricultural spending represents government's "political will" to support particular agricultural development objectives. The consistency in increasing agriculture's share of total public spending also indicates successful attempts by the Zambian government to follow a coherent path to support agriculture.

Even though government has succeeded to fulfill its commitment on time, it must neither slow down nor renege on this Maputo commitment in the future. The issue Zambia faces is that despite high volumes of spending, agriculture's contribution to the economy is not growing and rural poverty levels remain high. An investment analysis on Zambia by Thurlow et al's (2007) revealed that government will need to allocate 16 per cent of its national spending to agriculture in order to achieve and sustain growth of 6 per cent per year.

4.3 Intensity of Public Agricultural Expenditures

Public agricultural expenditures were indexed to agricultural Gross Domestic Product (GDP) to get a measure of the intensity of public agricultural spending (Edmeades, 2007). Results in Table 6 point to a positive trend in the amount of resources government spent on agriculture for each kwacha of agricultural output. In 2000, GRZ spent 3.18 ngwee for each kwacha of agricultural output. By 2008, GRZ spent 18.11 ngwee for each kwacha of agricultural output. The annual average spending intensity during this period was 8.41 per cent, Table 6. These trends are encouraging as government's spending intensity is above Africa's average range of 5.4 to 7.4 per cent. Asia's range is 8.5 to 10.5 per cent (Source).

Table 6: Intensity of public agricultural spending in Zambia, 2000 to 2008

Year	Agricultural GDP (constant prices)	Public Agricultural Expenditure	Agricultural Spending Intensity
2000	6650	211.8	3.18
2001	6899	409.0	5.93
2002	7240	353.0	4.88

2003	7898	542.0	6.86
2004	8599	563.3	6.55
2005	8752	677.4	7.74
2006	8923	826.2	9.26
2007	9442	1244.1	13.18
2008	9906	1793.8	18.11
Averages	8257	735.6	8.41

Source: CSO & MFNP

The size of the public agricultural budget is important indeed but size is not everything. It is possible to increase sector growth with the same size of budget if its composition is changed. The quality or composition of the budget matters. The next section discusses the types of public spending in Zambia.

5. FUNCTIONAL ANALYSIS OF PUBLIC AGRICULTURAL EXPENDITURE

This section scrutinizes the composition of PAEs by looking at the nature of the goods and services government is paying for. The analysis of the distribution of public resources across various functions informs the debate on whether Zambia is protecting spending on core functions or the pillars of agricultural growth.

5.1 Why composition of spending matters?

Insufficient clarity on the optimum composition and returns to various components of PAEs in Zambia exist. What is desirable is to have spending that gives the highest impact on agricultural GDP. For every 1 per cent increase in PAE, Zambia should be able to realize a 0.3 per cent increase in agricultural GDP (Thurlow, 2007). If Zambia only achieves a modest return of 0.15 per cent, then government would have to double spending to agriculture to get the same effect on GDP. Simply increasing the level of spending is unsustainable and will not grow agricultural incomes and reduce poverty (Lopez, 2005). More gains could be achieved by addressing misallocation of resources across sub-sectors without necessarily increasing total PAE.

Ospina & Gunderson (1990) point out unequivocally that non-rivalry and non-exclusion consumption goods have characteristics which make it difficult for the private sector to produce and sell them. Services such as public quarantine and agricultural research benefit several producers even if they pay no price at all. The market will not provide any reward to the private sector for providing these resources. The private sector in Zambia or any other economy will simply not provide these services. Market regulation and investments in land, water, roads, energy, science and technology stand out as core functions of government. These are the pillars that CAADP has identified as core because they are needed to maintain an enabling institutional framework that allows private commercial agricultural investment to thrive. The absence of balanced investments across these pillars stymies private investment and delays agricultural structural transformation.

On the other hand, the function of supplying private goods or services such as farm requisites is a non-core function of government. Like in the rest of the world, these services can be effectively operated and managed commercially by the private sector. In Zambia, government justifies heavy involvement in non-core functions by suggesting that agricultural markets have failed. Furthermore, the coexistence of large commercial farms along the line of rail with small subsistence holdings outside the line of rail justifies a clear equity objective that compels government to directly distribute private goods (farm requisites) to smallholder farmers.

Market failure and equity alone are insufficient justification for continued government involvement in distribution of private goods. It is possible to expect actions by the private sector to correct such commercial failures when core public investments are put in place. It is also important to be aware of the potential for government failure. The measures proposed may not be the best to achieve the ends. Policy intervention could be even more costly to society because of the resources and budget involved. The benefits of intervention may not exceed the costs and interventions may cause serious market distortions and unintended adverse impacts on the agricultural sector. It has been shown (Jayne et al, 2008) that government provision of farm requisites to private individuals crowds-out private investment

in agricultural services. The true impact on production from such government spending is severely curtailed.

5.2 Agricultural functions of government

Table 7 lists eleven functions that government of Zambia performs in the agricultural sector. This classification attempts to mirror the classification of functions of government (COFOG) discussed in section 2. Against each function, the average share of the budget and the trends in spending since 2000 are shown. Each function is discussed in detail.

Table 7: Functional Classification of Discretionary Expenditure, Zambia, 2000 – 2008 (constant 2008 values)

Functions	Per cent	Annual average	Growth
	(%)	(ZMK' millions)	(%/yr)
Agric investments	1.6	8,608	0.3
Agric administration	7.6	40,309	-3.1
Crops research	5.0	26,170	1.4
Support to extension	16.7	88,071	8.9
Support to farmers	38.1	201,239	16.0
Maize price and income support	20.2	106,765	12.7
Agrarian reform	1.2	6,571	6.3
Agric information	1.0	5,259	4.8
Livestock research & development	3.3	17,387	5.3
Fisheries	1.1	5,687	6.3
Forestry	4.1	21,518	2.6
Total Agric Sector	100	527,480	7.7

Source: Ministry of Finance and National Planning

5.2.1 Support for subsistence production

On average, the dominant function (38% of spending) of government in agriculture is to provide farm requisites to subsistence producers. Smallholder farmers are given fertilizers and seeds by government. Security institutions, such as, police, prisons and army are assisted to run their production units. These expenditures show a strong positive trend and recorded a phenomenal growth of 16% per year over the last nine years, Table 7. No other function has absorbed that amount of resources. In addition, no other function has increased its spending faster than support for subsistence production. In terms of size of spending, this is clearly the priority function for Zambia's government. Haggblade (2007) argues that provision of private farm requisites by government generates very low returns because of rent-seeking and crowding out of private investment. Prioritizing spending on low-return programs reduces the overall impact of total PAE on GDP. It is possible for Zambia to continue increasing resources to this function but fail to register sustainable growth in the sector.

The economic argument in support of these programs is that the welfare of Zambians who need food assistance is better when free or subsidized inputs are distributed than when free food is distributed. But there is no evidence to suggest that these programs give more benefits than what they cost the nation. Distributing subsidized inputs can be wasteful if what is returned is worth less than the cost. If the net benefits are negative, it could be more economic to supply food assistance rather than production support. Direct benefits accrue to

only 10 – 20 % of the farm population (Govereh et al 2006). The bulk of the farming community are directly un-touched by this mega function of government.

Even when there is a justification for government to provide fertilizer, seed and equipment to smallholder farmers, the army, prisons and the police, there is need for evidence for the effectiveness of such intervention. Is there value for money from such spending each and every year? Government could spend on fertilizer but register virtually no change in production, that is, no value for money. This problem occurs due to lack of additionality. The impact of Fertilizer Support Program (FSP) after making allowances for what could have happened in its absence is negligible. Much of the changes following the introduction of FSP would in fact have occurred anyway, especially in areas along the line of rail (Jayne et al, 2008). FSP has a lot of deadweight loss because farmers targeted can buy fertilizer on their own. The overall effect is not different from what would have occurred anyway. There is, therefore, little value for the money that FSP is spending.

5.2.2 Maize and farm income support

On average, 20% of PAE (ZKW106 billion) supports incomes of smallholder maize surplus producers and consumers. This is the second most important government function in agriculture in terms of spending. Maize is the dominant staple crop in Zambia. Although a foreign crop 400 years ago, colonial and independent republic governments have supported its production and consumption and created its dominance in Zambian diets (Jayne et al, 200?). All governments organized public agricultural expenditure around maize in order to achieve social stability and political legitimacy from voters. Though important and traditional, other staple crops do not receive such levels of support from government.

The trends in maize and farm income support show a high growth of 12.7% per year. This growth is above the overall growth in PAE, Table 7. The level of public expenditures on maize support declined following attempts to liberalize the domestic market but reemerged strongly in the last four years. Table 8 shows the physical quantities of maize that government purchased from the domestic market and what was traded externally (imports and exports). In 2006/7 marketing season, in particular, FRA purchased more maize than the total of all its purchases in all other years of FRA's existence, Table 8. Government's increased involvement in direct maize marketing has stretched its legal mandate of managing strategic reserves. Government, through FRA has taken on an additional objective of empowering smallholder farmers (FRA Personal Communication, 2008).

In Zambia, unfortunately, there is little value for the money that FRA spends. The net impact of FRA purchases after making allowances for what could have happened in its absence is negligible. Much of the purchases by FRA would in fact have occurred anyway. FRA has a lot of deadweight loss because private firms would have purchased the maize. In 2008/09 marketing season, private firms purchased maize and paid higher spot prices than FRA.

Table 8: FRA Maize Trading & Funds Allocated, Zambia

Marketing Season	Purchases	Imports	Exports	Allocations (constant ZK' million)
2000/01	0	0	0	0
2001/02	0	150,103	0	0
2002/03	23,452	41,608	0	50
2003/04	54,850	0	0	52,223
2004/05	105,300	0	22,098	47,196
2005/06	120,000	0	13,029	59,130
2006/07	386,450	49,274	230,000	140,000
2007/08	400,000	0	120,000	205,000
2008/09	72,000	0	0	340,000

Source: FRA updates

5.2.3 Support to agricultural extension

On average, agricultural extension is the third most important role of government. Successful modernization of Zambia's agriculture depends on the operations of a vibrant extension system but the low crop productivity levels obtaining in Zambia reflects poorly on the effectiveness of the current system. Table 9 shows that average crop yields are low by regional standards. However, crop yields have increased for most crops except for maize, sorghum and cotton. Use of improved seeds, application of fertilizer and quality management of pests and diseases determine yield levels. The technical knowledge and management skills farmers apply are only a function of the effectiveness of extension.

Table 9: Average yields and yield growth rates (%/yr) for selected crops produced by smallholder farmers, Zambia, 1991 – 2004

Crop	Average Yields (kg/ha)	Yield Growth (%/yr)
Maize	1369	-0.8
Sorghum	614	-0.4
Millet	741	0.3
Cassava – flour equivalent	933	2.0
Groundnuts	341	2.1
Sweet Potatoes	2069	0.7
Mixed beans	462	0.8
Cotton	863	-0.2
Soybean	606	1.0
Sunflower	410	0.7

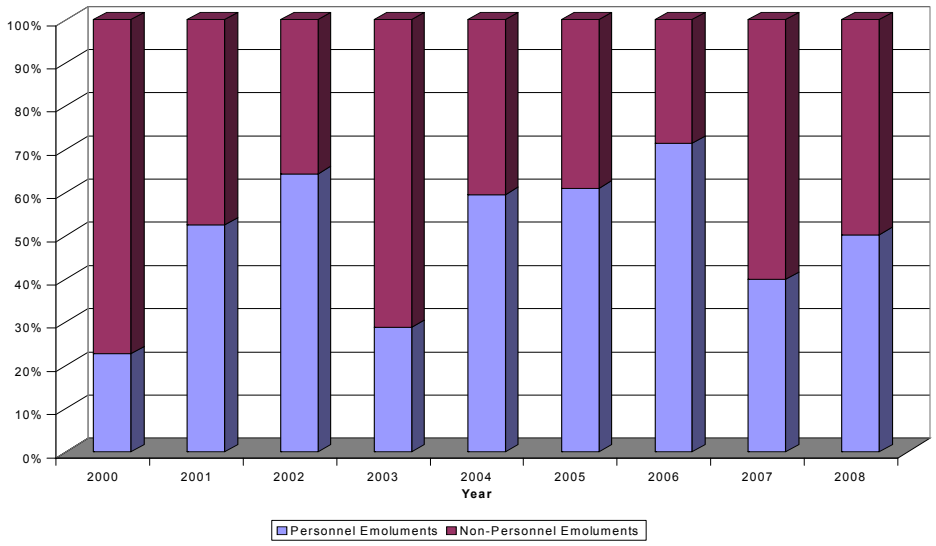
Source: CSO, PHS 1990 - 2004

GRZ spends on average 16% (ZMK 88 billion) of its annual public agricultural budget on extension but does not get much from it in terms of productivity improvements. Why then are productivity levels declining when government is continuously spending on agricultural extension? Where is government getting its value for such spending?

The effectiveness of extension partly depends on the distribution of resources within the extension department. A desirable balance is needed between the shares of fixed and operational costs. Simply paying salaries and not having adequate operational resources does

not make extension effective. Often when GRZ resources are limited, operational resources are sacrificed. GRZ is compelled to pay salaries even when extension staff has limited budget for programs.

Figure 3: Distribution of agricultural extension resources between personnel emoluments and non-personnel emoluments, Zambia, 2000 – 2008.



Source: 2000 – 2008 Financial Reports and 2007 – 2008 Estimates of Revenue & Expenditure, MFNP, GRZ

Figure 3 shows the distribution of expenditures between salaries and non-salaries. The share allocated to each category varies from one year to the next. On average, government has allocated an equal share (50%) between these two categories. In 2000 and 2003, the department of extension allocated less than 30% of its budget for personnel emoluments. But in 2006, nearly 70% of the department's budget paid salaries. This large share of personnel emoluments in 2006 is attributed to the recruitment of additional extension staff. Having the desired numbers of extension staff is necessary but to get these staff to be effective is a completely different matter. These additional staff may simply increase the number of beneficiaries on government welfare unless they are provided with operational resources.

5.2.4 Livestock research & development

The livestock industry is increasingly becoming an important part of Zambia's agriculture economy. In 2002/03 production season, livestock contributed about 35 percent of the total gross farm revenue for smallholder farmers (Zulu et al, 2008). In spite of the important role livestock contribute, a disproportionately lower share of 3.3% of total public agricultural spending was allocated to livestock research and development, Table 7. Given the economic role livestock plays, PAE priorities need to shift more towards livestock.

The meager public resources allocated to livestock, denies the industry capacity to adequately eradicate diseases of national economic importance. Disease outbreaks continue to deplete livestock populations and disrupt marketing. The responsibility to prevent and control diseases of national economic importance (foot and mouth disease, contagious bovine pleuro-pnuemonia, east coast fever and trypanosomiasis) is solely that of government. Without the

suggested spending shift, increasing the contribution of livestock to food security and income remains a never-ending dream.

5.2.5 Crops research and development

The challenge of increasing agricultural productivity lies in spending on research. A key factor that explains the success of the Asian Green Revolution was the development of improved production technologies. Table 7 shows that yields of staple crops are declining. This trend can only be reversed if adequate attention is given to research. On average, 5% of the agricultural budget is spent on crop research, Table 7. Only ZMK 26 billion is allocated to all crop research each year. Although more resources are being allocated in real terms, the increases in research expenditures are less than average.

Research in new seed varieties, fertilizer and pesticide use is fundamental to increasing crop productivity. Farmers constantly need improved technical knowledge to manage changing disease and pests regimes and meet market requirements. Investing in scientists and research institutions is the only way technologies that boost yields can be identified and introduced to farmers. Furthermore, developing new biotechnology-based solutions can help Zambia's farm economy become more resilient to climatic variability and climatic change. Spending on agricultural research is unfortunately not a top government priority. Yet science and technology investment is one of the four pillars of agricultural growth under CAADP.

5.2.6 Agricultural administration

Government of Zambia continues to spend on average 7.6% of its sector budget on administration, Table 7. The regulatory role of government is indispensable. The trends reveal a declining trend in administrative expenditures. This is the only function where spending has declined by 3% per annum during the period under review. This is expected given the budding liberalized agricultural economic environment in Zambia. Government has partnered with the private sector in regulating certain commodity chains. Sub-sectors such as cotton, tobacco, coffee, poultry, dairy and others are under statutory regulation through commodity Acts. Besides, regulation of all commercial trade in agricultural goods and services is in the hands of the Ministry of Commerce, Trade and Industry.

5.2.7 Agricultural investments

Agricultural investments in Zambia are the preserve of donors. Government's spending on agricultural investment is in the form of counterpart contribution to donor funded investment programs. The investment/counterpart funds take up 1.6% of total discretionary spending on agriculture, Table 7. Spending on counterpart funds has remained the same throughout the period.

Apart from these contributions, there is other spending from government which can be classified under agricultural investment. These investments include provision of dams, electricity, roads in farm blocks; establishment of small scale irrigation schemes; rehabilitation of research institutions and training colleges. These funds are embedded in other spending lines and are not easy to track from one year to the next.

5.2.8 Forestry and Fishing

Agriculture in Zambia is equally to do about forestry and fisheries on one hand and crops and livestock on the other. The contributions to GDP from the two groups are roughly equal,

Table 3. But the share of the budget that forestry & fisheries receive is not commensurate with their economic importance. On average, forestry & fisheries obtained 5.2% of the sector's budget (Table 7) while contributing nearly 50% of the sector's economic value. This is another case of unbalanced spending. It is possible to increase the sector's contribution to economic growth by realigning spending towards the most productive sub-sectors, such as, forestry. Trends in public spending in forestry and fisheries show a positive trend of 2.6% and 6.3% growth per annum, respectively. In order to increase production and promote sustainable utilization of forestry and fisheries resources, more resources are needed for these sub-sectors.

5.2.9 Land reform

On average, 1.2% of the sector's public budget is allocated to Ministry of Lands and the Department of Resettlement under the Office of the Vice President, Table 7. These institutions have the responsibility to service farm-block areas. The objective of opening these farm blocks is to settle a cadre of indigenous and foreign farmers into medium to large scale farming. Indirectly through this spending, government has been able to transfer land under traditional authority into state land. In terms of public funding, this function is very peripheral to government's interests. Yet, rapid growth in Zambia's agriculture hinges much on the development of a large-scale commercial sector. Considerable foreign direct investment in primary agriculture can flow in if government spends more in this function. Trends in spending for this function are positive and have grown at 6.3% p.a, Table 7.

5.3 Reconfiguring spending priorities

Core government functions in Zambia's agricultural sector have been articulated in different ways. Government Gazette Notice No. 547 of 2004 has outlined MACO's portfolio functions. The National Agricultural Policy (NAP) has also stated the role of the public sector in agriculture. These two documents have listed but failed to prioritize functions of government in agriculture. Prioritization of government functions in agriculture was only done in the Fifth National Development Plan (FNDP). Prioritization was done through an exhaustive dialogue process between government, cooperating partners and civil society. Prioritization was needed in order to redirect both government and donor expenditures towards core programs and bring public investments in line with CAADP strategy.

The FNDP top ranking function of government is long-term public agricultural investments, Table 10. Long-term public investments in land and water, agricultural infrastructure such as roads and energy stand out. Research and development for crops and livestock is ranked second, Table 10. Administrative functions are third priority. These functions include the operations of various departments such as human resources, policy & planning, agribusiness and marketing and cooperatives. Subsidy programs including FRA and FSP follow in at fourth priority. These programs are ranked low simply because they have a very weak link with long-term agricultural development. In the FNDP, these two programs were to be phased out in 2008. At the bottom of the priority list is expenditure on personnel emoluments. Paying salaries and wages of government personnel to perform core functions is important. But personnel emoluments have less influence on agricultural development unless it is accompanied with other more important expenditures listed above.

Table 10: Program Prioritization & Public Agricultural Spending in Zambia, 2000 – 2008

	Average spending		Growth	
	(%)	(ZMK' billion)	(%/yr)	FNDP Ranking
Long-term investments	3.4	16.0	8.3	1
Subsidies	52.8	245.2	6.5	4
Research & Development	18.1	83.9	8.6	2
Administration	5.4	24.9	-2.5	3
Personnel Emoluments	20.3	94.3	2.9	5
Total	100.0	464.3	5.6	

Source: MFNP

The key question for Zambia is whether priorities reflected in each annual agricultural budget match development priorities as articulated in the FNDP. Table 11 shows the resources government allocated across the five priority programs. Over the last seven years, long-term investments in irrigation, infrastructure and land development programs took up only 3.4 per cent of the agricultural budget. Subsidies including fertilizer, maize and other income support programs took up the biggest share of 52.8 per cent. Research and development which includes agricultural services and technology development for livestock, fisheries and crops took up another 18.1 per cent. Meanwhile, personnel emoluments for staff in MACO and in departments of forestry and resettlement under other ministries absorbed 20.3 per cent, Table 11. Administration which covers policy formulation and coordination, marketing and human resource development took the balance of 5.4 per cent. The actual share of expenditures across these programs reflects the priorities of government over the period of analysis.

What is clear from this analysis is that the FNDP priority list is at variance with the actual government budget priorities. Long-term investment which tops the FNDP list of priorities was given the least level of spending. Meanwhile the provision of subsidies and payment of salaries for civil servants was given the highest and second highest priority in the budget. Yet on the FNDP list, these two expenditure classes are ranked last. There is, according to this evidence, strong misalignment between agricultural development plans and public agricultural expenditures. Ideally, the two processes should reinforce each other.

Schmid (2000) contends that cost benefit analysis has limited capacity to guide political choice of size and content of public spending and regulation. Analysts have always assumed "the economy can be treated as if all persons are identical so that no distributive weights are needed" (Schmid, 2000). Conflicts in perceptions and preferences is the under current for distributive questions. When deciding on content of public spending, politicians decide whose interests count and whose does not. The resolution of these distributive questions which analysts assume away could explain the variance between the content of a government budget and the budget for "technocrats or analysts".

6. SPATIAL INCIDENCE OF PAES

This section investigates the distribution of PAEs across provincial boundaries. The assessment sheds light on the extent to which spatial distribution of public spending is driven by production versus equity objectives. To get insights on this issue requires spatially disaggregating public agricultural expenditure data.

6.1 Public agricultural spending and farmer settlement

Geographical identification of public expenditures is possible in so far as expenditures are de-concentrated. Provincial administrations receive allocations for land resettlement and forestry programs directly from the treasury. Personnel emoluments and RDCs for field officers are also assigned to different administrative levels. Similarly, spending by FRA and FSP are disaggregated. Spending for research and by HQ departments cannot be disaggregated by province. Spatial analysis will, therefore, cover that part of the overall budget which is de-concentrated. In addition, this analysis was only performed for 2006 financial year. Not all the expenditure data is disaggregated in previous years.

Table 11: Provincial distribution of public spending per agricultural household for selected agricultural programs in 2006, Zambia (ZMK real prices 2008 = 100)

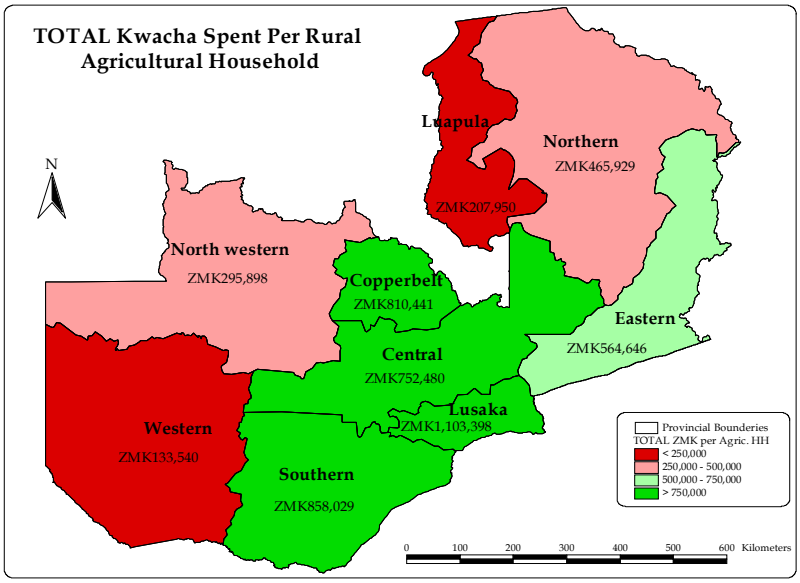
Province	Extension	Forestry	Resettlement	Fertilizer Support	Maize purchases	Total
Central	58,371	9,869	10,370	188,361	480,059	752,481
Copperbelt	120,595	27,861	5,330	449,389	196,297	810,441
Eastern	35,171	4,819	1,791	166,029	353,198	564,646
Luapula	47,370	6,104	6,935	66,588	77,951	207,951
Lusaka	129,528	28,649	12,714	505,810	424,264	1,103,398
Northern	48,007	4,527	1,855	135,056	276,477	465,929
Northwestern	65,115	9,161	7,390	87,233	127,000	295,899
Southern	122,721	4,525	5,166	270,879	449,810	858,030
Western	51,736	5,374	5,670	37,709	27,736	133,540

According to Table 11 and Figure 4, spending per farmer is highly polarized. Spending is concentrated in Lusaka, Copperbelt, Central, Southern and Eastern provinces. These five provinces make up Zambia's maize belt. Maize production and consumption dominates all other food staples in these provinces. Provinces in the northern and western parts of Zambia are served less by public agricultural expenditures. These provinces make up Zambia's cassava belt where cassava production and consumption dominates. Luapula and Western provinces are the least favored and receive the lowest public agricultural expenditures.

Based on MACO's Crop Forecast Estimates of 2006/7 and 2007/08 production seasons, only a quarter of Zambia's maize area and output is in the cassava belt. Provinces in the northern and western parts of Zambia grow surplus cassava but government has no deliberate program in the national budget to support the cassava industry. Haggblade et al (2008) observed northern Zambia as a dual staple zone, where maize and cassava co-exist in significant quantities in production and consumption baskets. This cassava belt, serve as a potentially important food security shock absorber, enabling the release of maize to deficit maize belt areas, thereby moderating Zambia's food shortages. In a seemingly short production season of 2008, the cassava belt provided the bulk of the strategic reserve maize (FRA, 200*). The

maize belt had dried out of surplus maize by July. A disproportionate larger share of public agricultural resources is spent in the maize belt than in the cassava belt.

Figure 4 : Spending per Rural Agricultural Household, Zambia



Extension and fertilizer budgets per farmer for provinces in the cassava belt are lower than in the maize belt, Table 11. Farmers from Western, Luapula and Northwestern derive the least benefit from public agricultural programs. Given that government programs are maize centered, the cassava dominant farming systems in north and western parts of Zambia is a factor that government uses to discriminate against these provinces. Because very little surplus maize is produced in north and western parts of Zambia, very little maize focused support is given to these provinces.

Farmers in Lusaka and Copperbelt provinces get the greatest support for forestry, Table 11. Western province farmers get the least public forestry support despite the province being one of the main sources of hard wood in the country. Again Lusaka and central province farmers have the greatest spending under resettlement. Eastern province has one of the highest population densities of agricultural households but receive the least spending per farmer for resettlement.

6.2 Distribution of FSP spending

According to Table 12 and Fig 6.2, there is disparity in the fertilizer distributed per ha of maize grown (fertilizer allocation rate). Within the maize belt, Copperbelt and Lusaka provinces stand out as receiving the highest allocation rate. The remaining provinces in the maize belt get less than half of the allocation rate the other provinces get. In the cassava belt, Luapula and Northern provinces receive disproportionately more fertilizer support than Northwestern and Western provinces. Western province gets the least fertilizer allocation rate in the whole country.

Table 12: Provincial distribution of FSP fertilizer and FRA maize purchases, 2005/06 & 2006/07, Zambia

Province	Fertilizer Support Program fertilizer in Kg/ha of maize planted	Food Reserve Agency purchases of maize in Kg /ton of maize produced
Central	51	196
Copperbelt	122	113
Eastern	54	418
Luapula	115	353
Lusaka	122	270
Northern	110	470
Northwestern	54	224
Southern	47	435
Western	13	115

Figure 5 : FSP fertilizer in Kg/Ha of Maize Planted

Error! Not a valid link.

It is clear, maize area planted in each province does not determine FSP fertilizer allocations across provinces. The most infrastructure endowed provinces in the maize belt received a higher allocation rate. Farmers in Lusaka and Copperbelt provinces are in close proximity to commercial fertilizer outlets and government's highest allocation rates to these two provinces does not add to total fertilizer use but simply crowds out commercial fertilizer (Xu et al, 2008). On the other hand, in the cassava belt, where private commercial fertilizer distributors are scant, higher allocation rates can help to generate demand and crowd-in private sector retailers in future. The lowest allocation rate in Western province indicates, among other things, that government has limited capacity to distribute fertilizer where basic infrastructure is not available.

6.3 Distribution of FRA purchases

FRA maize purchase rates are lower in the most infrastructure endowed provinces and the western part of the cassava belt, Table 12 and Figure 6. Copperbelt province recorded one of the lowest purchase rates in the maize belt. Southern and Eastern provinces have high purchase rates. Copperbelt and Central provinces have alternative and vibrant commercial maize markets. In most seasons, the prices that FRA offers to farmers in Copperbelt are much lower than what commercial markets offer. The pattern of FRA purchase in the maize belt is consistent with the idea of letting the private sector operate near major consumption centers. Within the cassava belt, Northern and Luapula provinces got the highest purchase rates. Northwestern and Western provinces get disproportionately low purchase rates. Northern and Luapula provinces are remote from main consumption centers and attract less commercial maize purchasing interest. FRA, therefore, may be filling a void created by the limited presence of private traders.

Figure 6: FRA Purchases of Maize in Kg/ton of Maize Produced

Error! Not a valid link.

It appears that the distribution of PAE is simply driven by the production system. Maize production and consumption zone receives more government spending than the cassava zone. However, within the maize belt, FRA distribution of spending is consistent with desire to lower income disparities whilst FSP fertilizer allocation rates are driven by other objectives other than reducing income disparities.

6.4 Poverty incidence and public agricultural spending

Figure 7 shows the incidence of poverty in Zambia's nine provinces. The incidence is highest in most provinces with the exception of Lusaka and Copperbelt. This pattern reflects past public and private investments in these provinces. Public agricultural spending should not reinforce these dichotomies but should aim to bridge the gaps. Lowering income disparities using public resources promotes economic cohesion.

Figure 7 : Incidence of Poverty Levels in 2006

Error! Not a valid link.

The current regional distribution of government agricultural spending is neither efficient nor equitable. Evidence in the fertilizer market has shown that high fertilizer allocation rates in the most infrastructure endowed areas, does not add much to total fertilizer use. The commercial sector is very vibrant in these areas. Concentration of subsidized fertilizer in the less productive regions will crowd-in commercial services and create incentives for using modern inputs. The poor rural infrastructure in the cassava belt especially the western part raises transaction cost and lowers farm incomes for farmers. According to Omama (2002), lower farm incomes reduces the demand for and use of improved inputs and creates a self-reinforcing downward spiral in rural welfare.

The current spatial distribution of agricultural expenditures mirrors that of maize production potential favoring provinces producing maize. Is it not the case that public agricultural expenditures especially under FSP and FRA are suppose to overcome or correct market failures which are severe in the cassava belt? The results of this exercise show that the existing regional emphases of public agricultural expenditures need to be reversed. In the current maize belt, public expenditures should facilitate a greater role for markets and private institutions rather than direct intervention. Counterbalancing expenditures which transfer funds to the least developed regions minimizes the degree of regional polarization (Martin et al, 2004). Future public agricultural spending should emphasize the less favored cassava belt in order to alter incentives and input-output relations. This approach may be justified on efficiency and equity grounds.

7. SUMMARY AND RECOMMENDATIONS

7.1 Summary

In the last fifteen years, agriculture has emerged as the main pre-occupation for the majority of households in Zambia. Unfortunately, the sector stagnated and continues to do so. Production growth at 1% pa is too low to sustain a population growth of 3% and is far off the CAADP target of 6%. There is a general loss of productivity in the rain-fed crop systems, livestock and fisheries. The low productivity trends are a result of 20 years or so of neglect. The increasing trends in the incidence of poverty in rural areas come as no surprise.

Low productivity is partially attributed to misplaced spending priorities. There is a general lack of proportionality when it comes to agricultural spending. In Zambia, 65% of the total poor are in the rural sector. Yet the share of agricultural spending among donors and the Zambian government is less than 5%.

Spending is misaligned as contributions of various sub-sectors to national production are not matched with spending allocations. Forestry is a significant contributor to economic growth yet it gets low allocations relative to its economic contribution. The allocations are not going to programs with high returns for growth and poverty reduction. Programs with high returns for growth seemingly are given lower priority than politically expedient programs. Public agricultural expenditure issue is more about priorities rather than limited resources. Fulfilling the CAADP commitment is necessary but it is insufficient to rescue agriculture from the slumber. The same amount of resources if spent efficiently can do more than otherwise. Public expenditure policy to support cassava, fisheries, and livestock sub-sectors is weak.

Public agriculture poverty reduction programs have wholly been about subsidizing less than 10% of the farm population. Public agricultural infrastructure investment has been sidelined. There is limited evidence that the subsidies are effective. Public spending on maize subsidies have increased but the sub-sector performance has not shown any corresponding additional change. Maize area, yields and output have remained stagnant. It is doubtful under these conditions that agriculture's public budget gives value for money.

Agricultural infrastructure and public services (research and extension) is poor and it is getting worse. More investment is needed yet public and donor funding is decreasing. Since the introduction of austerity measures, agricultural infrastructure investment became difficult to justify and short term expenditures became easier to implement. Despite the commitment to increase agricultural expenditures, structural difficulties to increase public agricultural investment abound. There is also unbalanced composition of RDCs versus emoluments. The effectiveness of agricultural research and extension services is adversely affected if wage share exceeds 60%. Between 2000 and 2008, Zambia has averaged 70%. Relative scarcity in RDCs has resulted in poor service delivery.

It appears that the uneven distribution of PAE is simply driven by the production system. Maize production and consumption zone receives more government spending than the cassava zone. High fertilizer allocation and maize purchase rates in the most infrastructure endowed maize zones does not add to total service but increases the degree of regional polarization. Concentration of PAE in the cassava belt will crowd-in private investment and counterbalance private investments and spending in the maize belt. Counterbalancing PAE

which transfer funds to the least endowed provinces minimizes the degree of provincial polarization.

Financing agricultural development is fraught with structural difficulties. Being an economic sector, government is not involved in farming and marketing agricultural produce in the same way it is involved in social sectors. In health and education sectors, government is central to execution. Much of the increase in public spending in Zambia has been achieved by boosting the expenditure lines that have a strong social orientation, i.e., input and marketing subsidies. These programs have a social and political appeal and are fashionable to decision makers. Boosting the economic aspects of the agriculture budget will require new thinking.

7.2 Recommendations

The how and what of agricultural development financing is a negotiating process. The budget is a political matter which is in the hands of government. The process is a means of sharing power. The budget that comes out is often a reflection of the negotiating process among power players. A budget that fails to address structural rigidities of the sector is weak suggest weak sector leadership. The strength or weakness of agriculture in the negotiation process depends on where agriculture is positioned within Cabinet. There are several ministries and those that have positioned themselves higher than others in Cabinet will find negotiating for more resources easier than others.

The role of other stakeholders in budget negotiation is very important. To get Cabinet commitment, agriculture will require networking with others at all levels. Farmer organizations, consumer associations, media houses, civil society, opposition and ruling party parliamentarians should all be part of this network. Agricultural leaders should use these networks to explain FNDP priorities, CAADP and EPA programs. The Ministry of agriculture also needs to build alliances with Ministry of Finance and State House. Agriculture can use these alliances to explain and give background to proposed budget lines. These networks play an important advocacy role during budget negotiations and formulation process.

To attract 10% of total public funding, the agricultural sector needs data and knowledge systems that make the objectives and outcomes very clear and convincing to the Minister of Finance. If Ministers of agriculture cannot define a clear vision for the sector, it becomes difficult to win Cabinet commitment of resources. Quality data could strengthen the position of agriculture in the budget process. Performance variables such as yield and output are difficult to guarantee because they depend on rain and quality of season. The Ministry of agriculture needs capacity in public expenditure reviews and policy analysis. Staff should be able to analyze the income raising and poverty reducing impacts of PAE using household level data. Besides, benefit-cost-incidence analysis is needed to show how effective programs are in targeting households. MACO needs to put up a good plan of action and demonstrate how agriculture contributes to solving political problems, such as, poverty and hunger. This requires investment in data generation.

Greater attention is needed on improving the quality and availability of data on the impact of spending. Data on the effectiveness of agricultural expenditures can be helpful in negotiations. Expenditure surveys could demonstrate how much of the resources spent reach those that it is intended to reach. Evidence of achieving the intended outcomes is helpful in showing how effective PAE are.

The treasury needs to be convinced that the sector can do what it has planned or targeted. Furthermore, agriculture should have capacity to absorb resources allocated. High outturns are desirable. The sector will not convince decision makers to allocate additional resources if the sector is failing spent what is budgeted.

Infrastructural investments have both complementary and synergistic effects within agricultural development. Investment expenditure needs sequencing and joint implementation. If roads are built first and R&D later, the rate of return for each investment will change if the sequence changes. Capturing the synergistic effects over time is difficult to express but it is easier to do this over space. Regardless of this difficulty and limited resources, the time order of agricultural investment is important and decisions have to be made on what investment will be implemented first.

Rate of return analysis is helpful but it is far fetched and very country specific. Given the not so good current state of knowledge, this paper cannot recommend investment choice in Zambia based on analysis done in other countries. The effects of various investments are a function of the policy setting. The alternative is to figure out what is the most binding constraint.

Expenditure analysis should analyze who benefits from the current distribution of resources. Regional disparities exist in Zambia. Investment in high potential areas may give the highest returns but accentuate inequity and social injustice. The challenge is how to target investment to maximize rate of return and equitable distribution of net benefits.

There is need for guidance to agricultural departments on appraising proposals for policies and projects. It is not enough that a proposed policy contributes to agreed objectives, unless there is consideration first of (a) better ways of achieving the objective and (b) better uses for the resources required. Markets should be left to function freely without interference unless there is some identified “market failure” or equity objective. It might still be possible to bring about some kind of non-public sector solution to problems identified by policy analysis.

REFERENCES

AU/NEPAD. 2006. Agricultural Expenditure tracking system in African countries. Paper presented at the international conference on "Championing Agricultural Successes for Africa's Future: A Parliamentarian's Dialogue on NEPAD". Somerset West, South Africa, May, 2006.

De, S.; T. Dmytraczenko; C. Chanfreau; M. Tien; G. Kombe. 2004. *Methodological guidelines for conducting a national health accounts sub analysis for HIV/AIDS.* Bethesda, MD: Partners for Health Plus, Abt Associates Inc.

United Nations, Food & Agricultural Organization. 2007.
Govereh, J., J.J. Shawa, E. Malawo and T.S Jayne. 2006. Raising the Productivity of Public Investment in Zambia's Agricultural Sector. Working Paper No. 20. Food Security Research Project, Lusaka, Zambia. December 2006. (CDIE reference number PN-ADI-176)

Government of Zambia, CSO, 2008. The Monthly. Volume 64, Lusaka, Zambia

GRZ. CSO. 2004. Main Zambia Census Report. Vol 10.

GRZ. MACO. 2008. CFS results.

GRZ. Ministry of Finance and National Planning. 2008 Budget Address, Lusaka, Zambia

Haggblade, S. 2007. Returns to Investment in Agriculture. *Policy Synthesis, Number 19*, Food Security research Project, Lusaka, Zambia

Haggblade, S. J. Govereh, H. Nielson, D. Tschirley and P. Dorosh. 2008. Regional Trade in Food Staples: Prospects for Stimulating Agricultural Growth and Moderating Short-Term Food Security Crises in Eastern and Southern Africa. Draft. Paper prepared for the World Bank, October 28, 2008

International Monetary Fund. 2006. *Government finance statistics manual (GFSM)*. 2nd Edition. Washington: Statistics Department, International Monetary Fund.

Lipton, M. 2005. The Family Farm in a Globalizing World. 2020 Discussion Paper. IFPRI, Washington, DC

Mellor, J. 1976. The New Economics of Growth. Cornell Press, Ithaca, NY

Omama, S.W. 2002. Efficiency and Equity in Public Investments in Agriculture: Lessons from Soil Fertility Research in Kenya. In Jayne, T.S., I.J. Minde and G. Argwings-Kodhek (eds) *Perspectives on Agricultural Transformation: A View from Africa.* Nova Science Publishers, Inc. New York.

Palaniswamy, N and R. Birner. 2006. Financing Agricultural Development: The Political Economy of Public Spending on Agriculture in Sub-Saharan Africa. IFPRI, Washington, DC

Schmid, A. 2000. Economic Analysis and Efficiency in Public Expenditure. Chapter 2 of "Handbook of Public Finance" eds. J. Backhaus & R. Wagner.

Thurlow, J., & P. Wobst. 2006. Not all Growth is Equally good for the Poor: The Case of Zambia. Journal of African economies 15 (4): 603-25

Thurlow, J., S. Benin, X. Diao, H. Kalinda & T. Kalinda. Agricultural Growth and Investment Options for Poverty Reduction in Zambia. Paper presented for Zambia's CAADP Roundtable Discussion. Draft, October, 2007.

Von Braun J. 2008. Combining Growth with Social Protection in Africa. Paper presented at conference on the convergence between social service provision and productivity-enhancing investments in development strategies, Durban, January 29 – 31, 2008

Xu, Z. W. A. Burke, T.S. Jayne and J. Govereh. 2008. Do Input Subsidy Programs "Crowd In" or "Crowd Out" Commercial Market Development? Modeling Fertilizer Demand in a Two-Channel Marketing System. Forthcoming in *Agricultural Economics* Volume 40, Issue 1

Annex A. Public Agricultural Expenditure in Zambia 2000 – 2008

	2,000	2,001	2,002	2,003	2,004	2,005	2,006	2,007	2,008
MIN. OF AGRIC AND COOPERATIVES									
Headquarters	12,131	7,358	6,361	15,881	6,628	4,120	5,001	4,214	7,958
Human Resource and Administration	0	0	0	0	2,555	2,665	2,194	3,087	4,688
Policy and Planning	767	1,128	1,967	6,596	2,342	3,458	14,920	12,896	9,364
Agriculture Department	12,539	18,395	15,541	25,454	40,192	16,099	12,851	33,167	21,951
Zambia Agricultural Research Institute	2,716	12,102	6,724	14,168	7,125	5,555	6,406	14,495	10,832
Veterinary and Livestock Development	1,853	4,683	7,283	8,543	14,068	8,036	6,286	30,820	20,139
Agricultural Training Institute	973	3,743	2,279	6,326	6,650	9,298	7,584	15,005	17,228
Fisheries Department	456	1,559	1,603	2,270	3,556	3,089	2,936	7,540	8,684
Agribusiness and marketing Department	902	7,890	6,047	5,198	2,191	2,583	1,135	2,039	2,483
FRA Food Reserve Imports	0	0	50	52,224	47,197	59,130	140,000	205,000	80,000
Fertiliser Support	0	40,000	17,790	50,000	98,051	139,988	184,046	204,537	185,000
Cooperatives Department	822	0	5,118	11,615	1,342	1,179	1,149	10,010	1,924
Seed control and Certification Institute	79	237	635	2,821	1,263	2,571	854	5,467	4,935
National Agriculture Information Services	822	1,296	1,198	2,268	3,588	2,862	2,006	3,199	2,925
Agriculture Research Stations	0	0	0	0	0	759	342	3,103	2,700
Fisheries Research Stations	38	424	825	0	0	440	242	2,672	1,552
Veterinary and Livestock Development	0	0	0	0	0	313	141	7,025	2,026
Provincial and Districts Allocations	0	0	0	0	0	67,337	69,292	152,910	139,287
MINISTRY OF HOME AFFAIRS - ZAMBIA POLICE	0	0	0	0	51	1,000	0	1,317	1,411
MINISTRY OF COMMUNITY DEVELOPMENT AND SOCIAL SERVICES	198	5,064	25,965	4,007	30,072	20,840	16,202	10,647	647
MINISTRY OF DEFENCE	253	0	0	150	4,473	1,360	662	587	630
MINISTRY OF WORKS AND SUPPLY	0	0	0	0	0	1,721	11	51	0
MINISTRY OF LANDS	200	150	200	0	0	113	485	222	109
Ministry of Tourism, Environment & Natural Resources	0	0	0	0	0	0	0	0	0
Forestry Department	1,416	1,037	1,281	3,403	4,593	8,519	13,000	15,178	8,877
Forestry College	335	333	433	838	1,453	1,738	1,297	2,352	2,847
OFFICE OF THE PRESIDENT	0	0	0	0	0	0	0	0	0
Forestry	1,577	1,933	3,453	4,017	5,324	6,826	8,488	11,017	11,760
Resettlement	569	687	1,618	1,461	2,658	3,175	5,540	7,417	8,302
Other	0	0	0	0	0	0	1,401	556	1,946
Ministry of Finance and National Planning - CSO	0	0	0	0	1,233	4,752	2,114	3,433	2,337
OFFICE OF THE VICE PRESIDENT	0	0	0	0	0	0	0	0	0
Resettlement	395	646	434	893	943	1,090	1,427	2,340	3,317
DMMU	958	8,762	18,281	0	1,826	30,325	3,304	10,791	267
Government agriculture and forestry investments	4,027	0	7,297	2,031	14,269	1,156	11,329	5,016	16,223
TOTAL GOVERNMENT SPENDING	44,029	117,429	132,382	220,165	303,644	412,097	522,644	788,111	582,352
DONOR AGRIC AND FORESTRY INVESTMENT	30,433	48,395	38,967	71,162	62,048	108,334	199,630	405,145	339,259
TOTAL GOVT. SPENDING BY DONORS AND GOVT	74,462	165,823	171,349	291,327	365,692	520,432	722,274	1,193,257	921,611

ReSAKSS SA Southern Africa

Regional Strategic Analysis and Knowledge Support System

FACILITATED BY IFPRI | A PROGRAM IN SUPPORT OF CAADP IMPLEMENTATION

For more information, contact:

Coordinator
Regional Strategic Analysis and Knowledge Support System, Southern Africa
(ReSAKSS-SA)
Private Bag X813
Silverton 0127
Pretoria, South Africa
Telephone: +27 (0)12 845 9100
Facsimile: +27 (0)12 845 9110
E-mail: resakss-sa@cgiar.org
www.sa.resakss.org