

Selected Comments on Zambia Budget Allocation in Agriculture & Maize and Fertilizer Marketing in Zambia

Prepared for Presentation to Zambia PRBS Review Meeting

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June 5, 2007

Research and Outreach Activities Supported By:

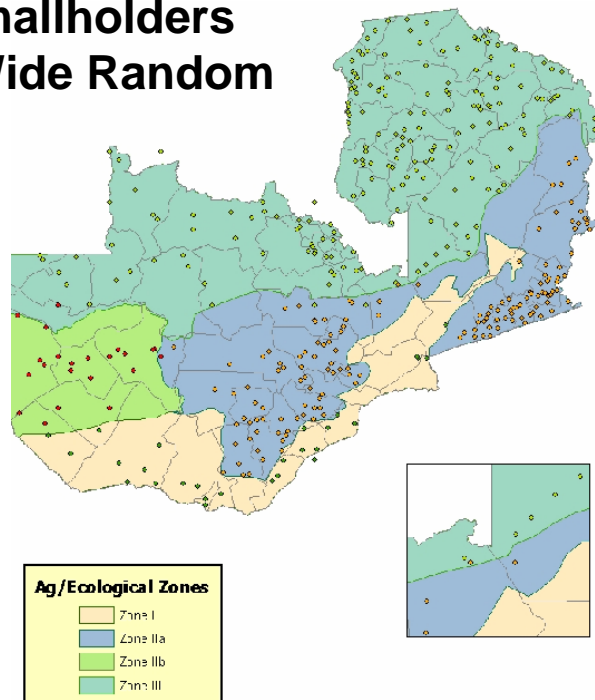
Ministry of Agriculture & Cooperatives



The Agricultural Consultative Forum

FSRP/MATEP

Empirical Data on Smallholders in Zambia – Nation Wide Random Surveys



Map of Central Statistical Office Statistical Enumeration Areas (SEAs) Sampled in the CSO/MACO/FSRP Post Harvest and Supplemental Surveys in 2001 and 2004 by Zambia's Agro-Ecological Zones

Presentation/Discussion Overview

- I. Public expenditures in agriculture in Zambia
- II. Maize production & marketing - features and issues
- III. Fertilizer use, distribution & marketing

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I. Outline-Public Expenditures in Zambian Agriculture

- Joint MACO/FSRP assessment of public agricultural expenditures
 - Why spend on agriculture?
 - Composition and trends of GOZ spending
 - Returns to suggested alternative public investments

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Why Should Zambia Spend on Agriculture?

- Achieve economic growth & poverty reduction goals of FNDP
- Stimulate private sector investments
- Invest in necessary public goods
- “No country has been able to sustain a rapid transition out of poverty without raising productivity in its agricultural sector.” Timmer, 2005

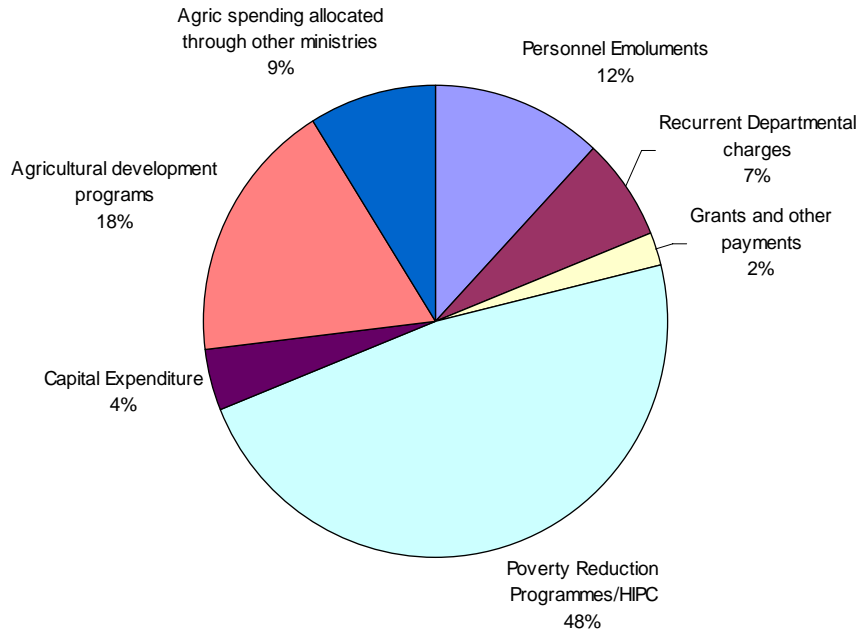
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What Investments Drive Productivity Growth in Agriculture?

- Technology (research on crops/livestock, extension, processing improvements)
- Markets (property rights, standards, contract law, adjudication, market facilities, market price and supply information, marketing extension)
- Infrastructure (roads, power, ports, communications)

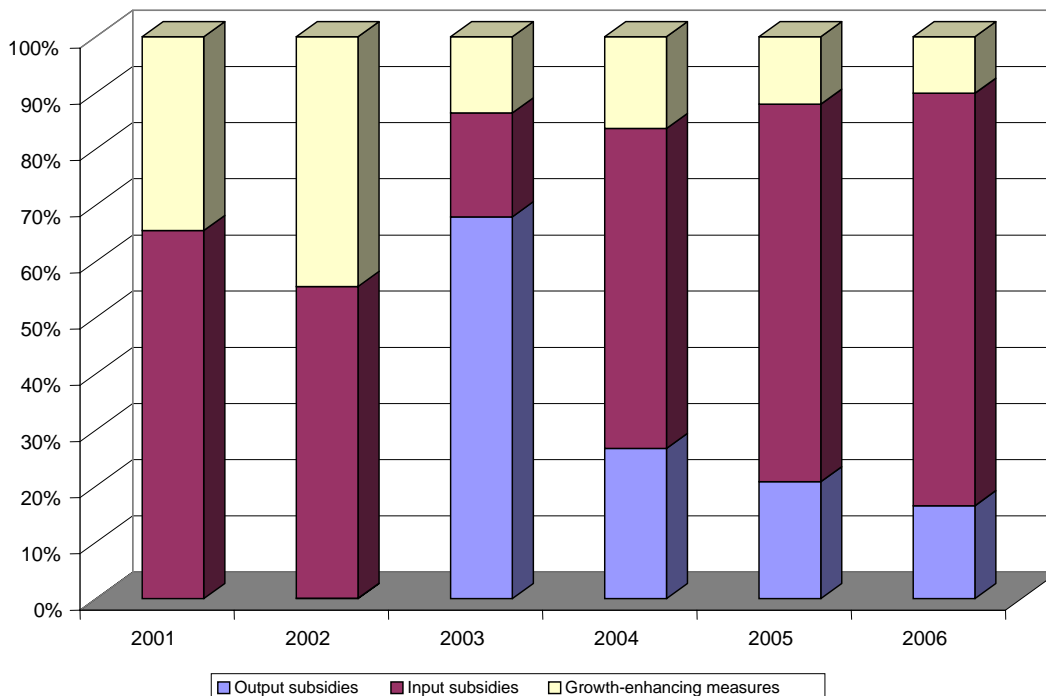
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Average Composition of Agricultural Spending, 2001 - 2006



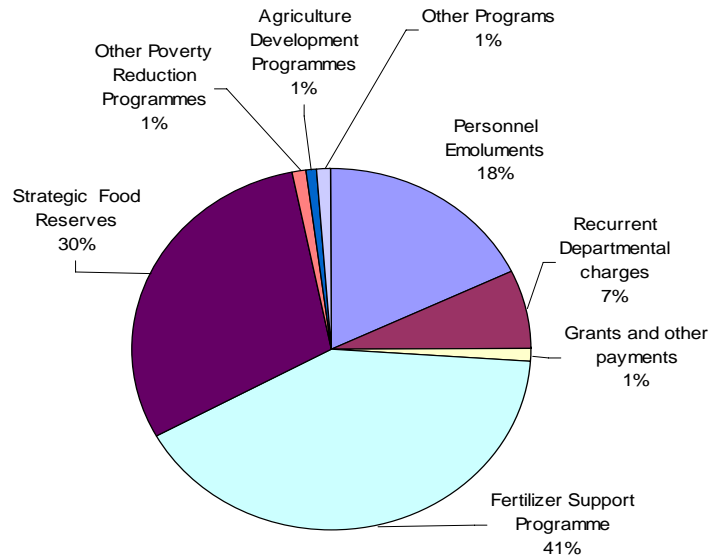
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Trends in poverty reducing investments (PRPs + agricultural spending through other ministries)

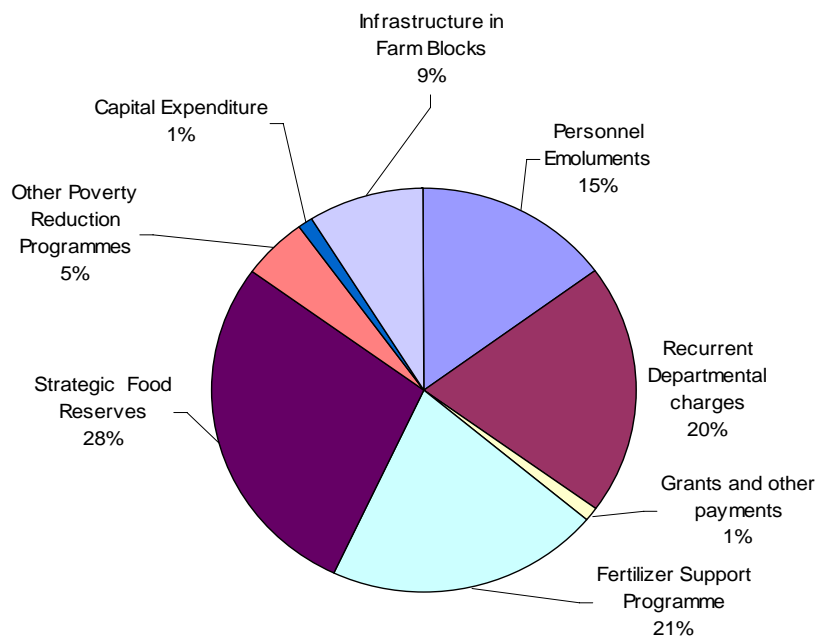


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Resource Allocation in the Ministry of Agriculture & Cooperatives, 2006



Public Resource Allocation for the Agricultural Sector, 2007



Spending for Agricultural Productivity Growth

	What are the Returns?
Subsidies for recurrent (private) inputs	
Public Investments	
- technology (R&D,ext)	
- roads	
- communications	
- irrigation	

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Agricultural Subsidies for Recurrent (private) Inputs

- Returns frequently **negative**

1% increase in budget share on agricultural subsidies **reduces** per capita agricultural income by .3% to .5%

15 Latin American countries, Lopez (2006)

Why Frequent Negative Returns?

- Subsidized inputs crowd out the private sector deliveries & discourage investments in new private fertilizer sales networks
- Misallocation and inefficiencies in usage does not encourage sustainable fertilizer use
- Diversion and rent seeking raises incomes of some but does little to raise crop productivity
- Late delivery of inputs does not improve productivity

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Agricultural Subsidies

- Returns sometimes positive, but generally lower than in investments

\$1 in ag. R&D → \$4.30 in ag. Income

\$1 in ag. subsidies → \$1.70 in ag income

43 countries, Fan and Rao (2003)

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What Influences the Benefit/Cost Ratio of Private Input Subsidies

- New seed/management technology becomes available to raise economic output
- Farmers have control over water
- Good extension services are present to assist learning
- Information/will is available to help target assistance to those farmers who otherwise would not use the private market
- Subsidies are rotated to different users each year to accomplish more new technology learning
- Scarce public funds always have an opportunity cost. If used for subsidies for private goods, who pays for needed public goods to complement private goods?

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Public Investments in Agricultural Research

	Returns
Asia	78%
Latin America	53%
Africa	50%

Allston et al (2005): 680 studies

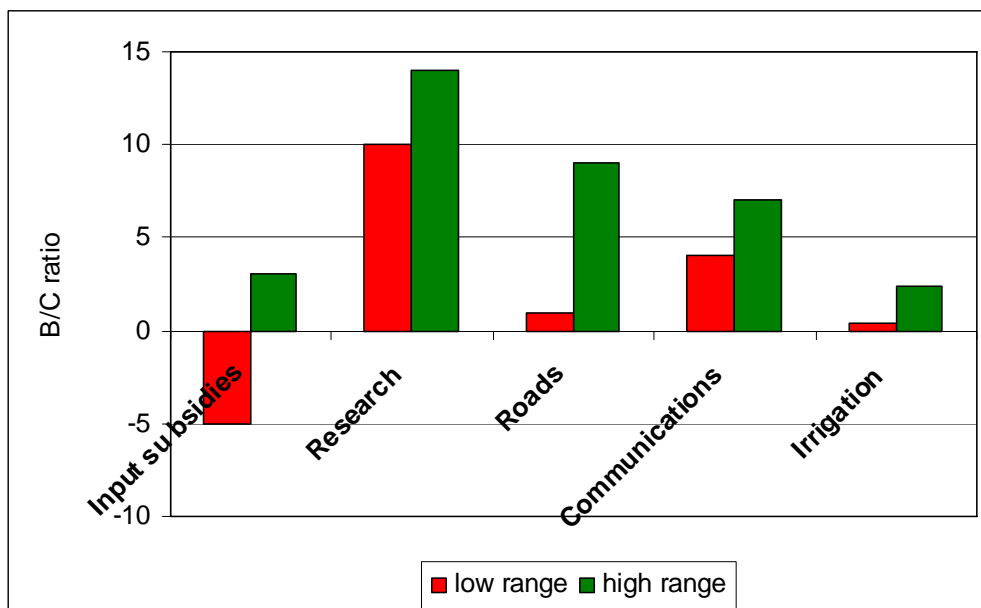
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Investments in Rural Uganda

	Returns to government spending (B/C)
Agricultural R&D	12.4
Feeder roads	7.2
Education	2.7
Health	0.9

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Summary: Returns to Alternate Forms of Ag. Spending



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I. Summary- Investment Implications & Challenges for Zambia to Reach FNDP goals

- Investment Composition:
 - allocation increasingly focuses on low return spending on private goods (financing maize and fertilizer)
 - at the expense of high return investments in productive public goods (research, extension, roads, communications, timely information, irrigation)

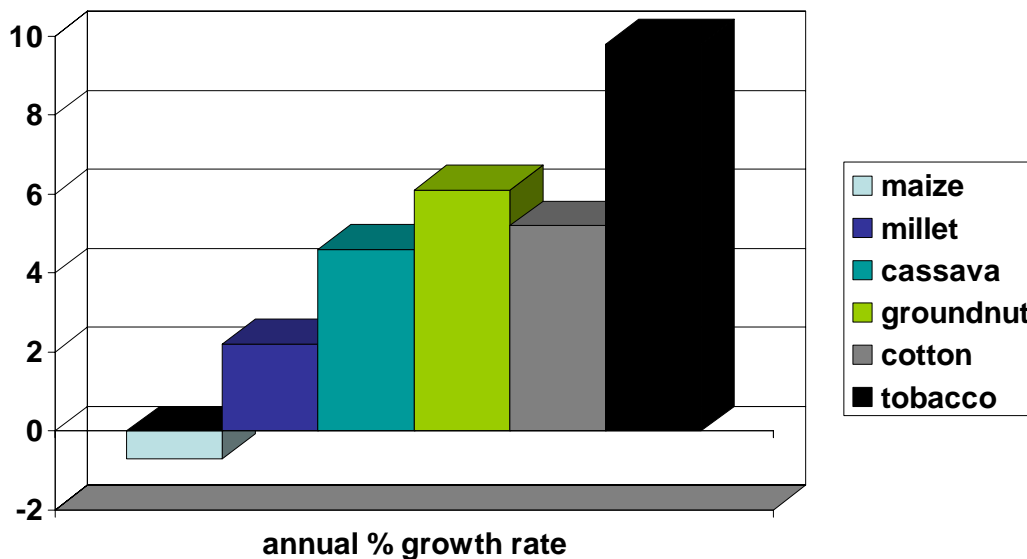
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II. Maize Production & Marketing Features and Issues

- The diversification success story has reduced maize production in areas where other crops have a comparative advantage
- But maize productivity among a majority of smallholders in remaining areas has not improved – maize grain purchases are vital for poor rural & urban consumers
- There is a production & marketing maize success story for a relatively small segment of the smallholder sector
- Re-emergence of FRA large-scale pan-territorial maize pricing across Zambia risks reversing the progress in crop diversification
- Govt investments in market facilitating infrastructure, timely price, stock and production information essential

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Zambia Annual Growth Rates, Selected Crops 1992/3-2001/02

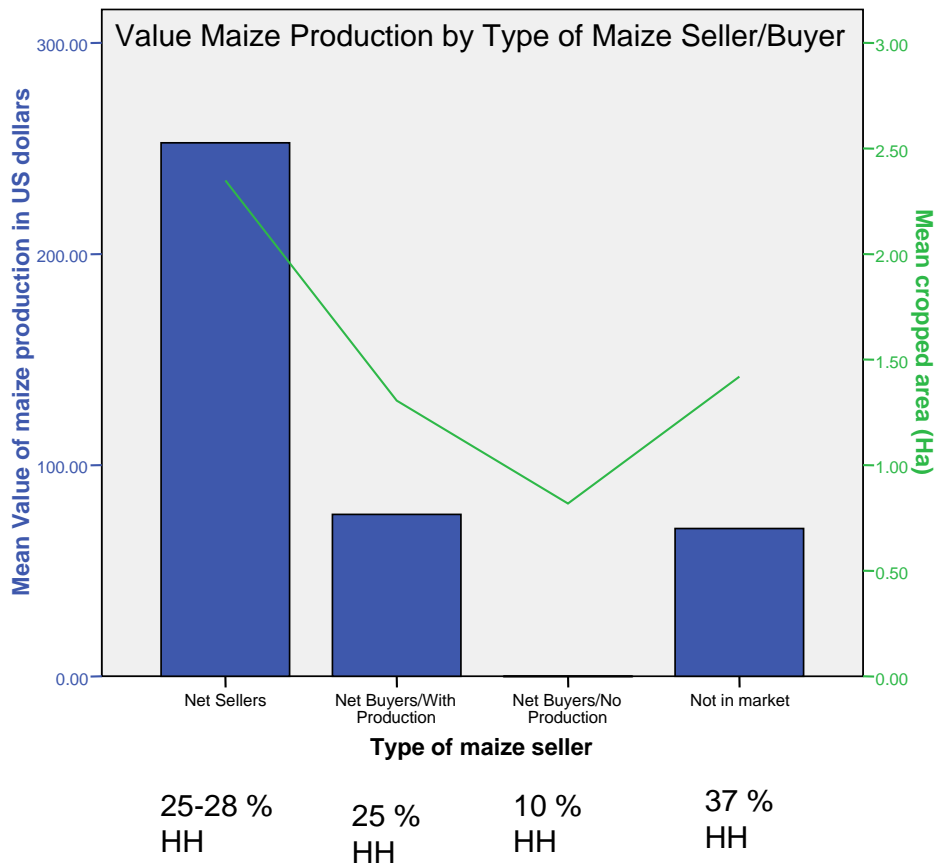


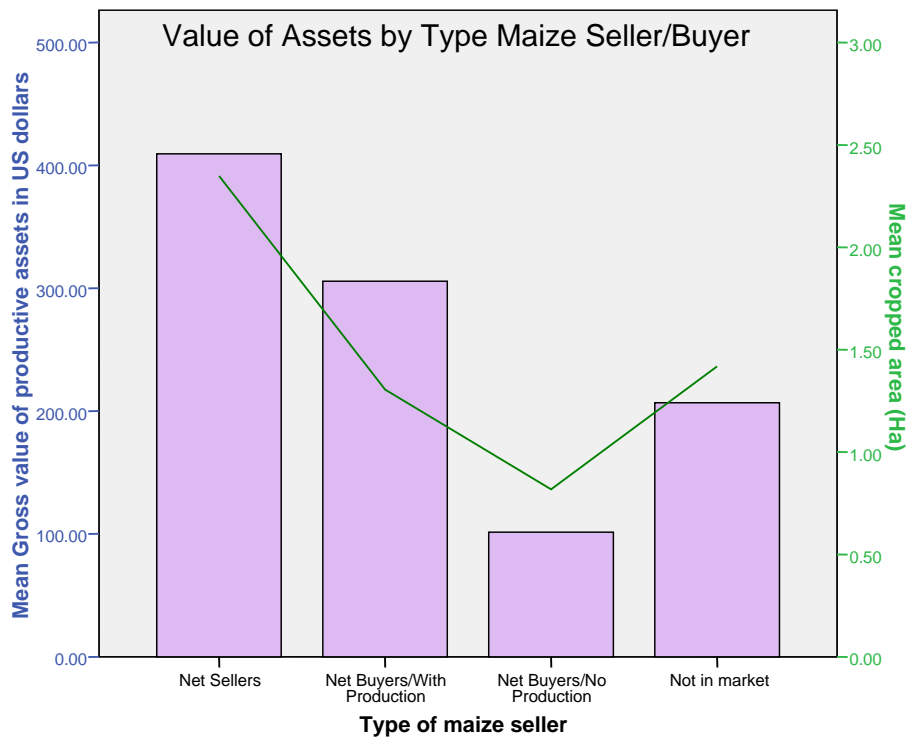
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Key Patterns of Smallholder Maize Production and Marketing)_{00 & 04 mkt years}

- Some 80 % of smallholders produce maize
- Only 25-28 % of smallholders sell any maize
- Sales % of national production range 23/27 %
- Vast majority of maize produced is stored and eaten on the farm – traditional on-farm storage needs help
- Production and sales are highly correlated with area cropped to maize – improved marketing requires information on best time of season to sell & best market buyers
- 35 % of smallholders are net buyers (grain & meal)
- 37 % not in the market as seller nor buyers

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25-28 %
HH

25 %
HH

10 %
HH

37 %
HH

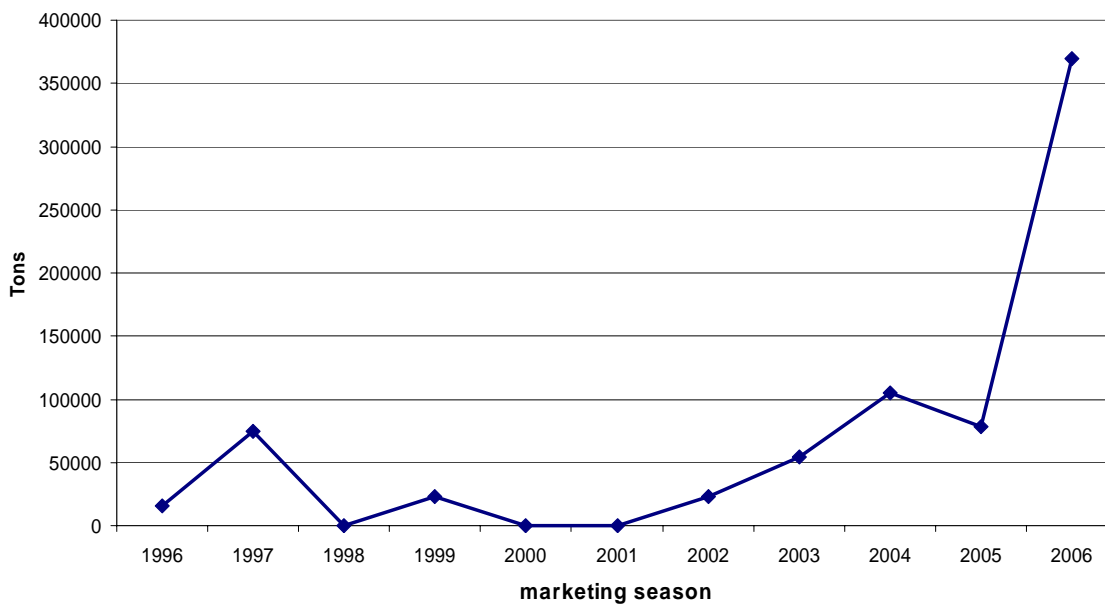
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Short-Run Maize Marketing Situation-1

- FRA direct interventions in maize mkt – modest increase since 2001; very large increase in 2006 election year with high financial and economic costs
 - FRA may have bought as much as 70,000 mt of maize from Mozambique and Tanzania in 2006 (see Annex for further details)
- Maize export opportunities in 2006/07 mostly lost – FRA is a high price/cost supplier & private traders mostly precluded from exporting
 - Zambia is losing export opportunities (esp to DRC) when regional and international maize markets tighten
 - Zambia has potential to become a reliable regional supplier & draw on Moz/Tan/South Africa when supplies are short.

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FRA domestic maize purchases



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Short-Run Maize Marketing Situation-2

- FRA plans for 2007 – Same/higher goals & uncertainty for private traders and commercial farmer domestic storage, sales and exports.
- Very large maize inventory carrying costs, high risks of grain quality deterioration and related cost
- FSP private good financing also end up going disproportionately to better off smallholders

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Given Smallholders Differences - Effects FRA Policy of Concentration of Smallholder Maize Production & Sales

- Only 25-28 % of the smallholder households in Zambia sell maize in a normal year
- But only 2% of these smallholder selling households (24,256 farms) account for 50% of the sales of maize
- Some 35 % of rural households are net buyers of maize – higher prices disadvantage these households

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Characteristics of Smallholder Farmers By Maize Sales Groups, Zambia PHS / FSRP Supplemental Survey - 2003/04 Mkt Season

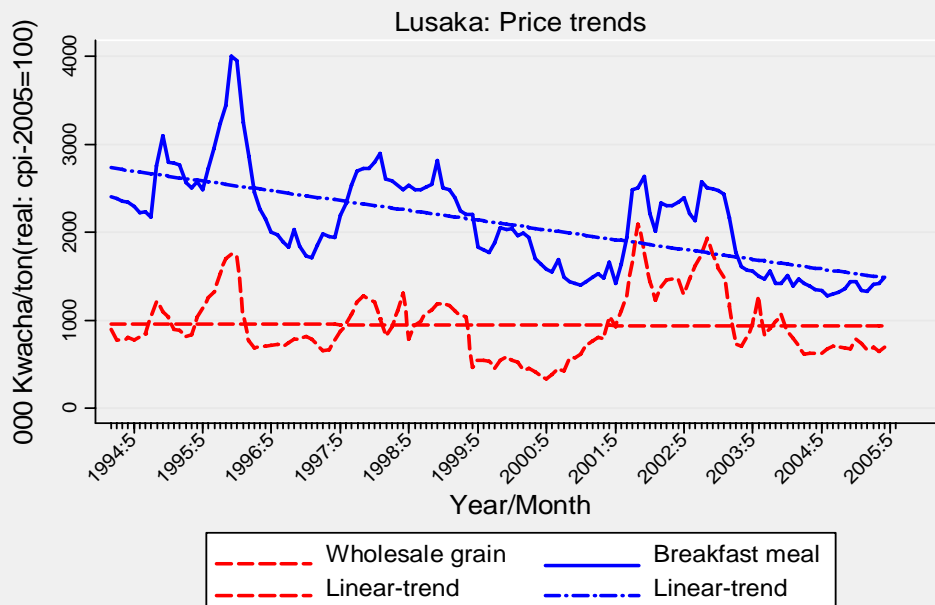
Maize Sales Groups	N=	Crop area (ha)	Asset values (Kw 000)	Gr. Rev., maize sales (Kw 000)	Gr. Rev., crop sales (Kw 000)	Total hh income (Kw 000)
Top 50% of maize sales smallholders	24,255	5.1	6,809	3,622	4,323	15,727
Rest of smallholder maize sellers	330,104	2.0	1,348	271	548	3,102
Households not selling maize	890,682	1.3	1,080	0	283	1,956

Similar patterns were found in the panel base year: 1999/00 for the PHS/Supplemental

Effects of Raising Maize Prices Above Market Clearing Levels

- Higher maize prices hurt the majority of the population who are net maize buyers
- Net maize buyers tend to be relatively poor farmers
- Zambia becomes a high price supplier to regional mkts and tends to loose market opportunities
- Many smallholders need improved technology to produce on less area enough maize to eat & raise incomes from selling other crops and labor services
- Since smallholder sales are so concentrated, FRA price-raising policies have highly regressive effects on income distribution
- Distribution of input subsidies also relatively concentrated according to production but many of these same smallholders are able to purchase inputs
- Competition policy in Zambia to keep maize meal prices low has been a major success story but need more small mills₁

Good News for Zambian Consumers - Tangible Benefits of GOZ & Commercial Development & Competition in The Maize Milling Industry:



Source: Agricultural Marketing Information Centre-Zambia-various years

Other Factors - Why is Maize Production & Marketing Not Thriving?

Information base required for government & private sector investors to make informed and timely decisions needs significant improvement

- CFS and PHS surveys are becoming increasingly inaccurate as measures of smallholder agricultural production
- Large scale maize production info. is especially unreliable
- Small-scale production estimates do not take enough account of rural population growth
- Over time, production levels are increasingly underestimated
- Timely stocks information (for traders & farmers) is lacking
- Inadequate market information, analysis & outreach to assist smallholder determine best when to store & sell

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Caution Regarding Size and Role of FRAs Strategic Reserve

- All evidence indicates that relying on regional trade is much more cost effective than very large and costly strategic stocks – cost to maintain grain quality and uncertainty on private sector storage investments of large FRA stocks overhanging the market
- Size of strategic stock need not be more than 2-3 months, because this is time required for imports
- GOZ needs timely information on production, stocks and local markets to make strategic import/export decisions
- These issues already addressed in AMDP
- Waiting for implementation of AMDP
- FRA's role needs to be predictable, stable and facilitating
- FRA could use maize market forward options contracts on South African maize to secure potential future supply access

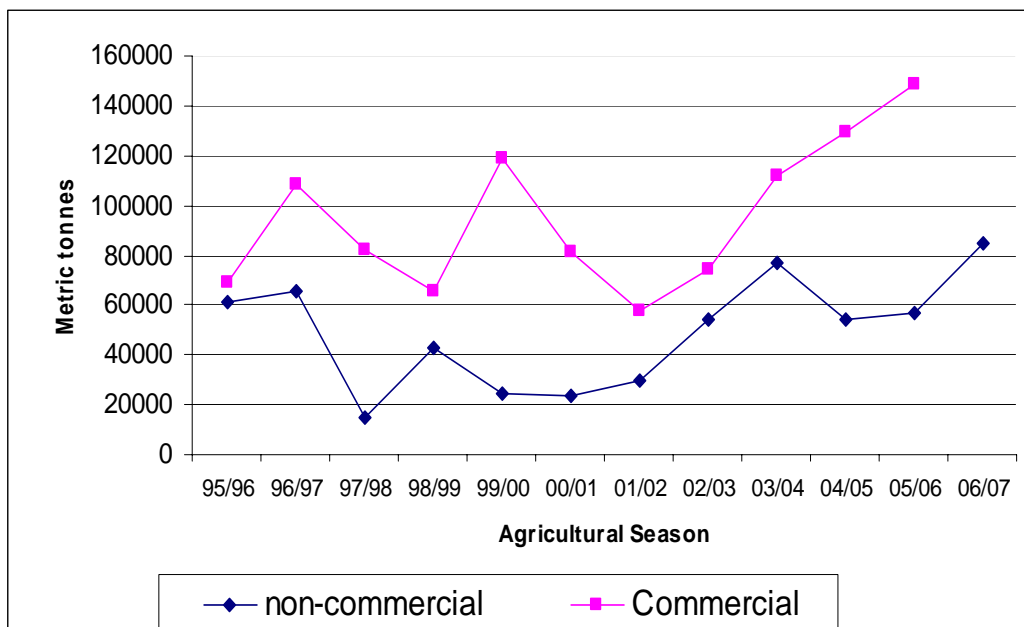
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III. Fertilizer Use, Distribution & Marketing

Guiding principals -soil fertility enhancement & use of inorganic fertilizers in Zambia

- Productivity growth requires fertility improvement
- Sustainability of improvements is key – importance of conservation farming and agro-economic regions
- Profitability of input use determines sustainability
- Crop choice by region and complementary inputs to fertilizer are critical for sustainability
- There is a smallholder learning curve on crops, management and fertilizer use – public/private extension
- Private dealer network for selling fertilizer and related inputs is key to long-term sustainability
- Free and/or subsidized fertilizer/other inputs is always highly political and subject to rent seeking as part of the targeting process. High transaction cost to reduce leaks³⁵

Fertilizer Supply in Zambia by Year: Commercial Versus Non-Commercial



Source: Fertilizer importers and Agricultural Statistical Bulletin

Spatial Focus of Private Sale and Public Fertilizer programs in Zambia, 2002/03*

Average % of farmers in each SEA buying from private outlets	Farmer fertilizer acquisition behavior within the SEAs				
	Non-users	From FSP	From Private outlets	From PAM	All Farmers
Zero %	39	7	0	27	
Btwn 0 & 25%	31	23	11	31	
Btwn 25 & 50%	21	37	31	26	
More than 50%	8	33	58	17	
Total %	100	100	100	100	
Total # of farmers	907,239	102,450	207,080	59,805	1,267,145

*National representative sample of 350+ CSO Stand Enumeration Areas (SEAs)- [the lowest geographic sampling unit in the CSO sampling framework for its annual Post Harvest Surveys. Each SEA contains roughly 150 to 200 rural households.

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Which Smallholders are Using Fertilizer? - Use Patterns by Source of Procurement & by Household Wealth Status, 2002/03 prod. season

	Smallholder households receiving fertilizer from government program	Smallholder households purchasing fertilizer from commercial retailers	Smallholder households not using inorganic fertilizer
Share of total national household sample ^a	13.9%	15.3%	79.1%
Kgs fertilizer acquired per household	122	120	0
Total household income (000 kwacha)	804	774	266
Asset value (000 kwacha per capita)	425	342	173
Landholding size (ha per capita)	0.23	0.20	0.15

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Note: ^a row adds to more than 100% because a small proportion of households acquired fertilizer from government and purchased fertilizer from private retailers. Source: Second Supplemental Survey, Central Statistical Office, 2004.

What Can We Learn - Looking at Maize Sales & Fertilizer Use

- All smallholders using fertilizer are relatively better off – from income, assets & land access perspective
- Overall smallholder gaining access to subsidized fertilizer are the best off, then those purchasing and finally non-users
- 2 % of smallholders who market 50 % of maize are heavy fertilizer users (92 %) getting about half their needs from govt programs (averaging 20 bags of fert. per hh.)
- Rest of maize sellers group – about ½ the farmers selling use fertilizer, with more coming from the market than from govt
- Most non-users don't produce enough maize to sell, but a group of non-maize sellers are using fertilizer from both govt and private market sources

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Fertilizer Sources and Use by Smallholder Maize Sales Groups, 2003/04 Marketing Season

Maize sales groups	Number of HHs	% of Fertilizer users	Total quantity purchased (tons)	Share of FSP fertilizer (%)	Share of commercial fertilizer (%)
Top 50% of maize sellers	24,255	92	19,960	21	23
Rest of maize sellers	330,104	51	38,951	38	47
Households not selling	890,682	22	32,063	41	30
Total	1,245,041	31	90,974	100	100

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Average Smallholder Purchases by Source & by Maize Sales Groups, 2003/04 Marketing Season

Maize sales groups	Fertilizer Support Program		Commercial Fertilizer	
	Number of purchasers	50 Kg bags per household	Number of purchasers	50 Kg bags per household
Top 50% of maize sellers	9,216	20	13,097	16
Rest of maize sellers	69,321	5	99,031	4
Households not selling maize	80,161	4	115,788	3
TOTAL	158,698	5	227,916	4

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Suggestions on Fertilizer

- Do more to build a competitive private sector fertilizer distribution system
 - Broaden private sector dealer networks
 - Focus public fertilizer distribution on viable/profitable areas and crops where private agents are not selling fertilizer
- Invest in research and extension to increase agricultural productivity
 - Crop cultivar, crop choice & agronomic management practices
 - Animal traction
 - Animal disease control and private sector vet drug sales outlets
- Focus policy attention on getting more land (consider options of 20 ha blocks) for smallholders in the customary system
- Improve rural roads to open additional land & cut input and output transport costs
- Enhance role of rural schools to improve learning and skills

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Zikomo Kwambili,
Natotela sana,
L'i tumezi ahulu,
Twalumba kapati,

Thank you to Zambian smallholders and to policy makers for this opportunity to obtain/share information and ideas – we welcome questions and comments