

# Research Findings on Alternative Approaches for Raising Smallholder Agricultural Productivity

## Implications for USAID Support for the CAADP Program



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with colleagues from MSU

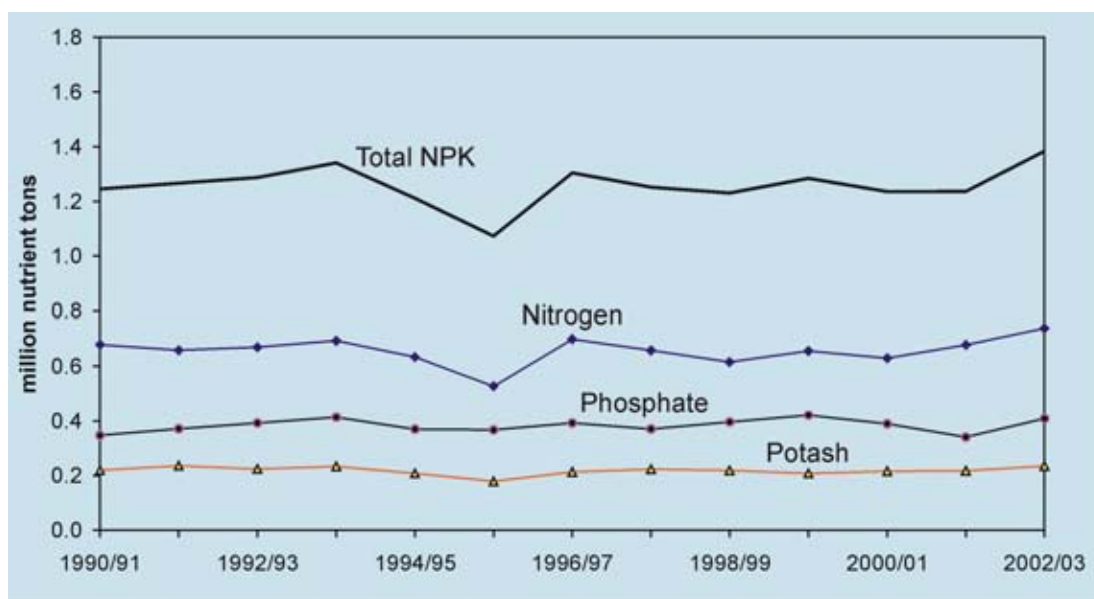
Panel Discussion, USAID/Africa Bureau, Washington DC  
January 24, 2008

## Current thinking on “strategy”

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- Strong consensus about need for greater investment in public goods (infrastructure, crop science) and certain policy reforms
- Major debate with regard to what constitutes the right “enabling environment”
  - Input subsidies – “smart” subsidies
  - food price support/stabilization
  - the role of regional trade
- Not sufficient to say “we’re committed to more investment in agriculture”
  - *What kind of investments*
  - *What kind of policy environment*

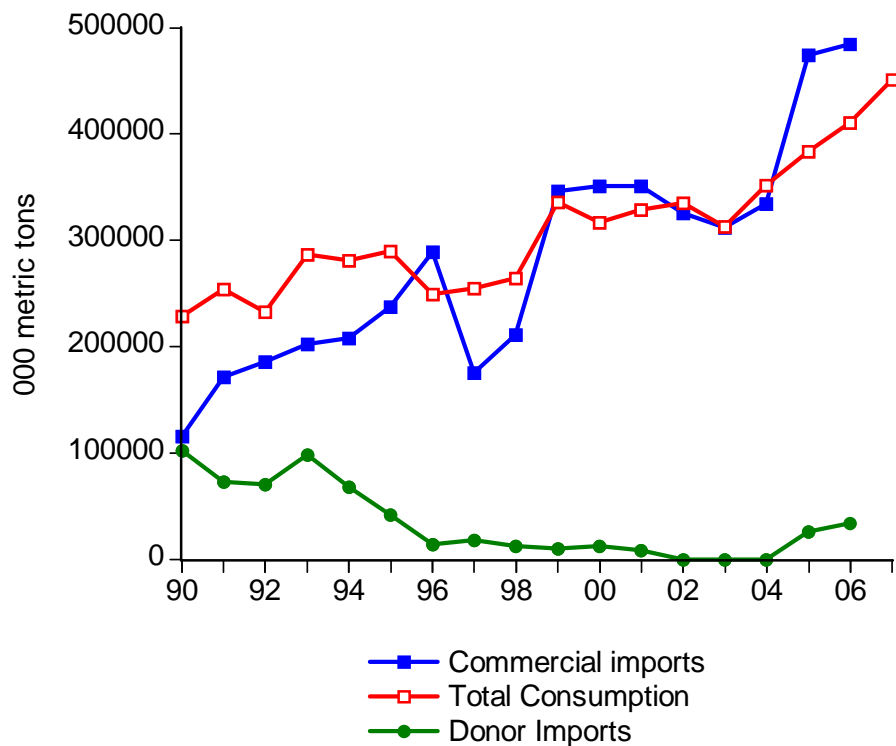
## Sub-Saharan Africa: Nitrogen, Phosphate, Potash, and Total NPK Consumption, 1990/91 - 2002/03



Source: Bumb, 2003, Derived from FAO data.

Intensity of fertilizer use (1996-2002)	% growth in fertilizer use intensity (kg/ha cultivated) (mean 1996-2002 / mean 1990-95)	
	< +30%	> +30%
< 25 kg/ha	DRC (0.5, -47%)	Uganda (0.6, +237%)
	Angola (0.7, -69%)	Rwanda (1.8, +89%)
	Niger (0.9, +5%)	Mozambique (3.2, +142%)
	Guinea (2.0, -4%)	Ghana (3.6, +68%)
	Burundi (2.3, -6%)	Chad (4.3, +93%)
	Madagascar (2.9, -8%)	Cameroon (5.9, +77%)
	Mauritania (4.0, -64%)	Togo (7.0, +30%)
	Tanzania (4.8, -47%)	Cote d'Ivoire (11.8, +53%)
	Gambia (5.2, +15%)	Botswana (11.8, +294%)
	Nigeria (5.6, -73%)	Senegal (13.2, +67%)
	Burkina Faso (5.9, -28%)	Ethiopia (14.4, +71%)
	Zambia (8.4, -34%)	Benin (17.6, +76%)
	Mali (9.0, +7%)	Lesotho (23.2, +35%)
	> 25 kg/ha	Swaziland (30.5, -40%)
	Malawi (30.8, +9%)	
	Zimbabwe (48.3, +9%)	

## Fertilizer use trends in Kenya, 1990-2006



## % of Small-Scale Farmers Using Fertilizer

	1995/96	1996/97	1999/00	2003/04
Coastal Lowlands	2%	3%	5%	6%
Eastern Lowlands	19%	30%	37%	46%
Western Lowlands	2%	3%	4%	8%
Western Transitional	29%	32%	59%	61%
High Potential Maize Zone	67%	69%	86%	90%
Western Highlands	52%	57%	73%	74%
Central Highlands	63%	78%	90%	93%
Marginal Rain Shadow	12%	20%	22%	27%
Nationwide Sample	43%	51%	64%	69%

## Reasons for the Upsurge in Fertilizer Use in Kenya

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1. GoK has maintained a stable fertilizer policy stance since 1990
  - Eliminated import licensing quotas
  - Foreign exchange controls
  - Retail price controls
  - No large subsidy programs to undercut private investment in fertilizer distribution system

## Reasons for the Upsurge in Fertilizer Use in Kenya

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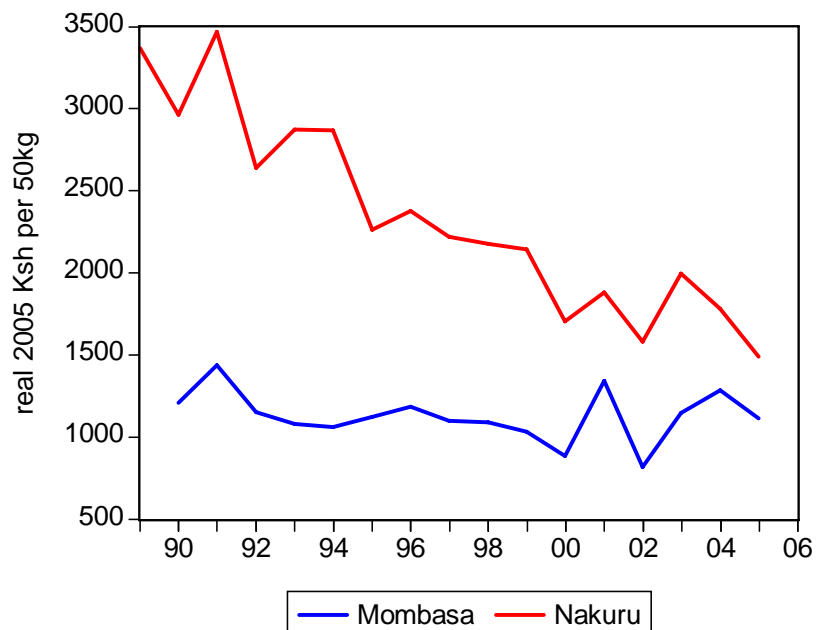
2. Private sector investment in fertilizer distribution has expanded rapidly
  - 10-11 importers
  - 500 wholesalers
  - 8,000 retailers

# Reasons for the Upsurge in Fertilizer Use in Kenya

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3. Small farmers' are now much closer to fertilizer retailers
  - 1997: 8.4kms
  - 2004: 4.3kms

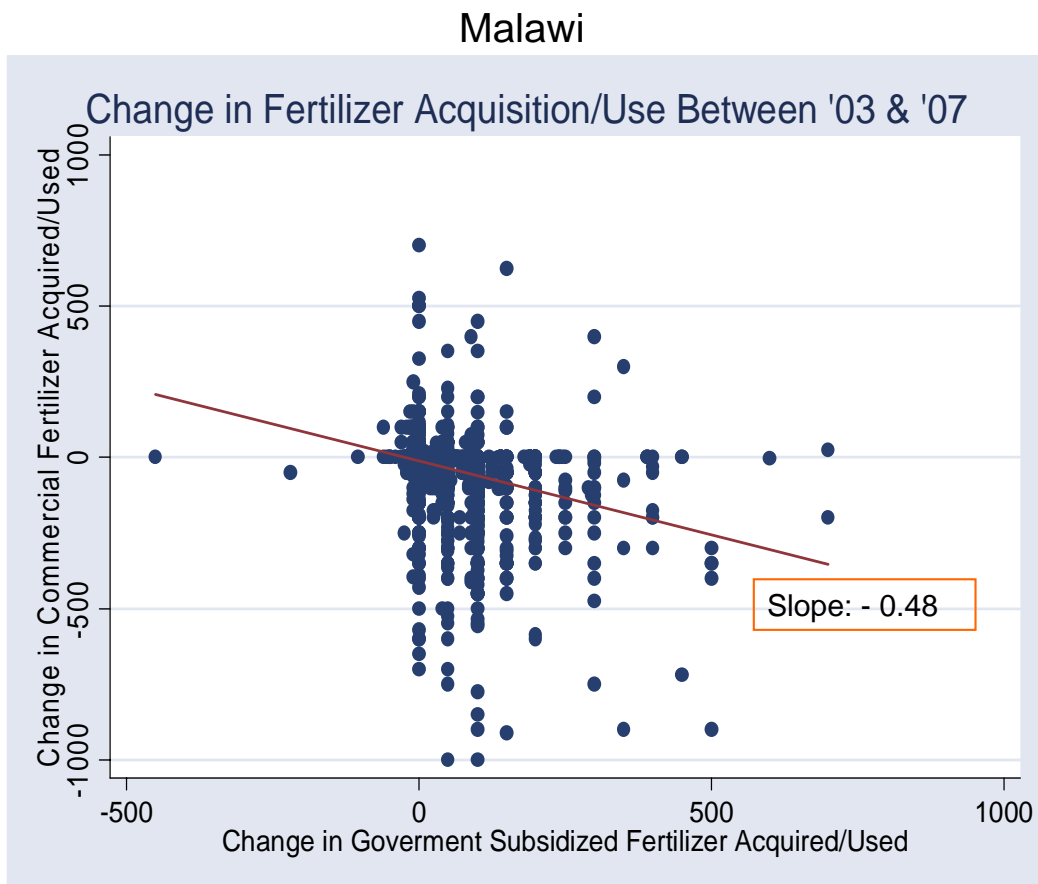
## 4. Large decline in fertilizer (DAP) marketing margins



# What about fertilizer subsidies?

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1. Need dispassionate assessments of costs and benefits
2. Some governments will press ahead with subsidy programs regardless – what should USAID do in such cases?
  - Are there complementary investments that would raise the effectiveness of subsidy programs?



Zambia	Total Income	Assets	Landholding size
	'000 kwacha per capita		ha per capita
<b>Fertilizer source:</b>			
<i>Households not acquiring fertilizer:</i>	266	173	.15

Source: Govereh et al, 2006

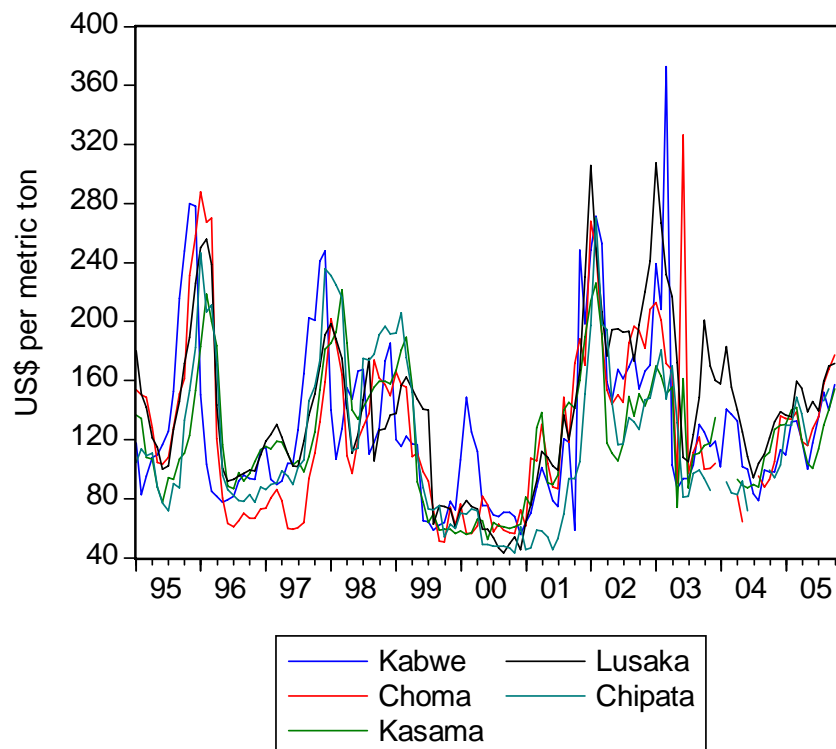
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<i>Households not acquiring fertilizer:</i>	266	173	.15
<i>Cash purchases from private retailers:</i>	774	342	.20
<i>Government Fertilizer Support Program (50% subsidy)</i>	804	425	.23

Source: Govereh et al, 2006

## 5. Price of maize: Zambia



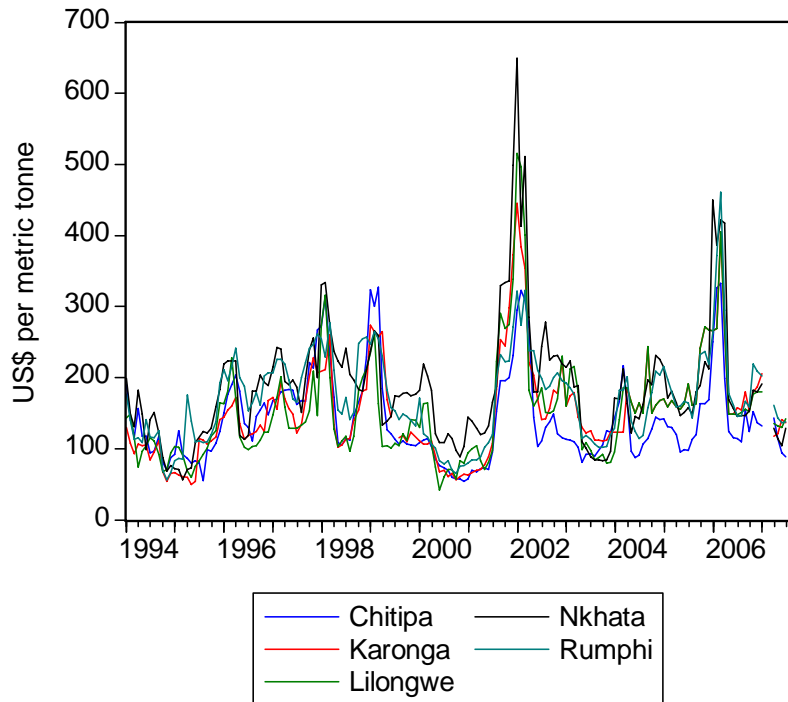
20th  
percentile of  
prices:  
US\$ 114

50th  
percentile of  
prices:  
US\$ 142

75th  
percentile of  
prices:  
US\$ 187



## Retail maize prices: Malawi

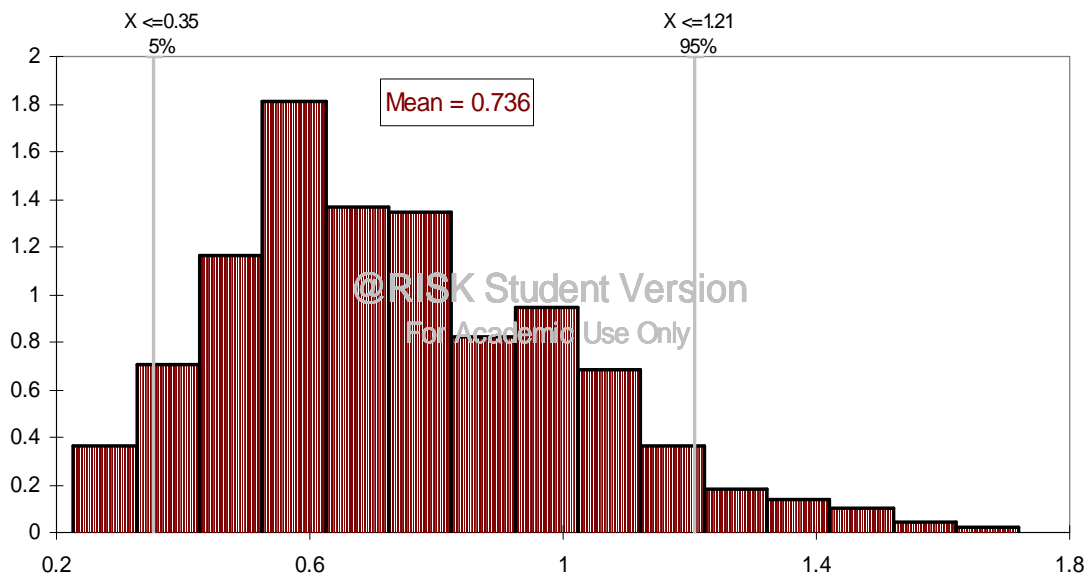


25th  
percentile of  
prices:  
US\$ 103/mt

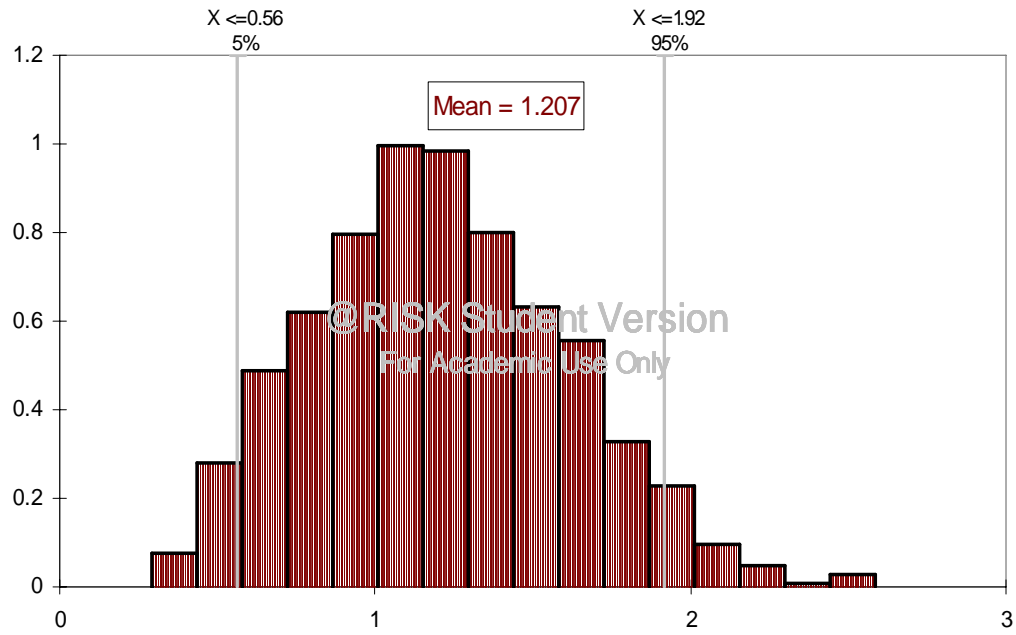
50th  
percentile of  
prices:  
US\$ 143/mt

75th  
percentile of  
prices:  
US\$ 169/mt

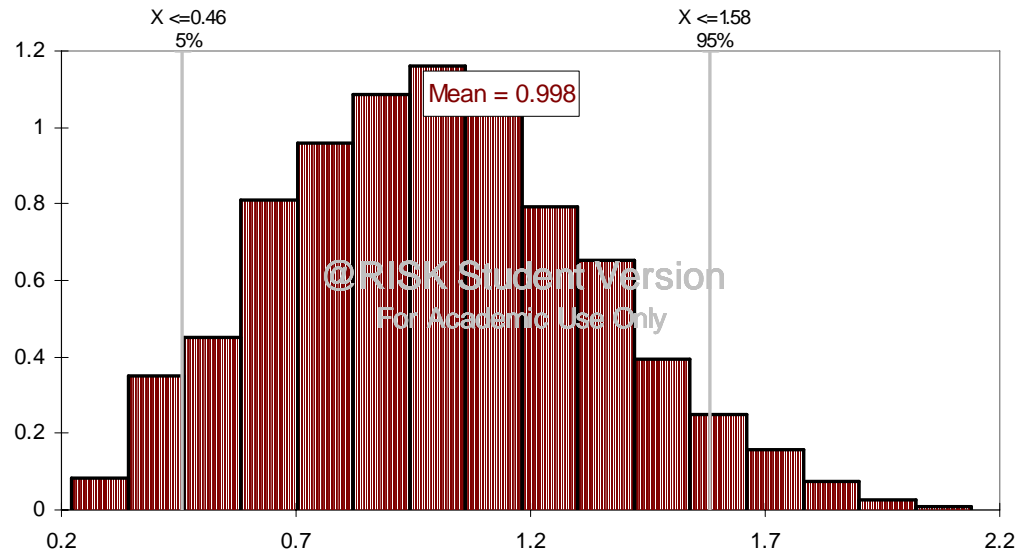
### Scenario 1: Distribution of Benefit-Cost Ratios, Malawi Fertilizer Subsidy Program: Historical maize prices, Chitipa



Scenario 2: Distribution of Benefit-Cost ratios, Malawi fertilizer subsidy program: Mean maize prices of \$200/mt



Scenario 3: Distribution of benefit-cost ratios, Malawi subsidy program: mean \$200 maize prices and \$625 fertilizer cost



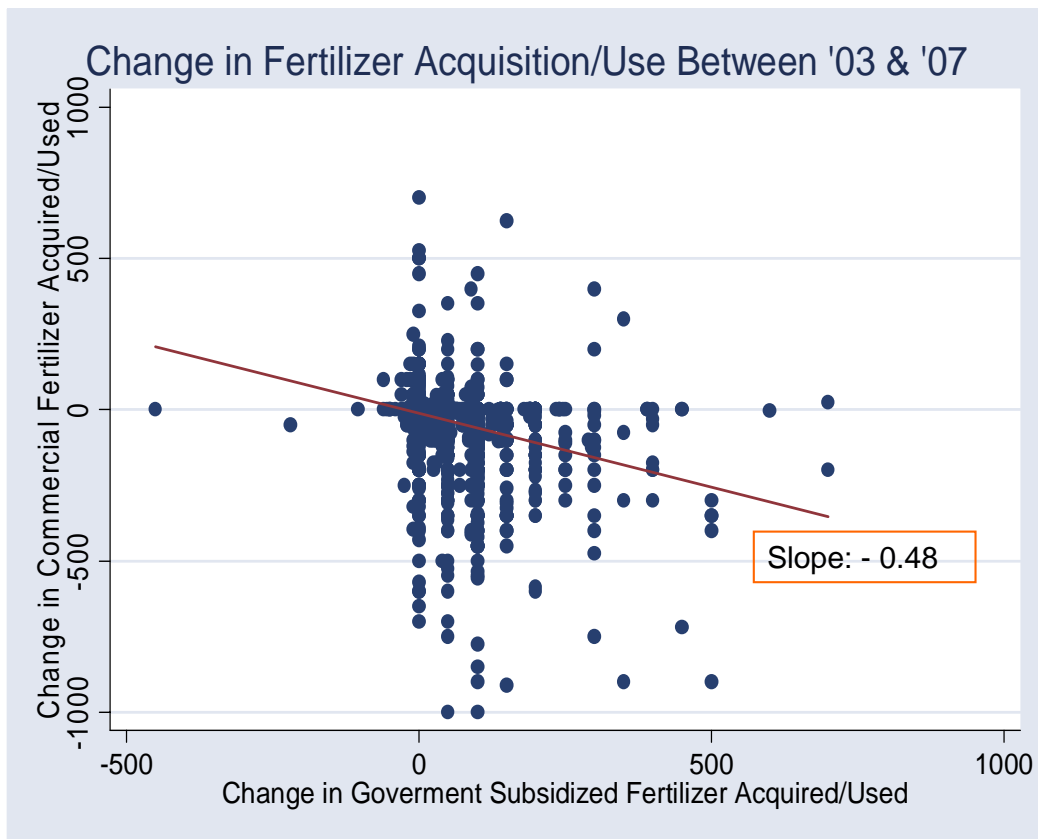
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- 2006/07 fertilizer subsidy program in Malawi:  
**B/C ratio: 0.83 – 1.50**  
**average B/C ratio: 0.74**
  - Average of all simulations in Zambia, using alternative parameter estimates:  
**B/C ratio: 1.07**
  - These B/C estimates assuming FSP fertilizer is delivered on time and used in correct proportions
  - Caveat: some indirect impacts of fertilizer subsidy programs are not included in B/C ratios

### Three reasons for estimated low B/C ratio of fert subsidy programs:

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1. Relatively low maize-fertilizer response rates (need for improved farm management, know-how!)
2. Poor targeting
  - One must question where “smart subsidies” are politically feasible
3. Displacement of commercial sales → limited overall additional fertilizer use

## Malawi



### Factors that could improve B/C ratio of fertilizer subsidies (and smallholder productivity)

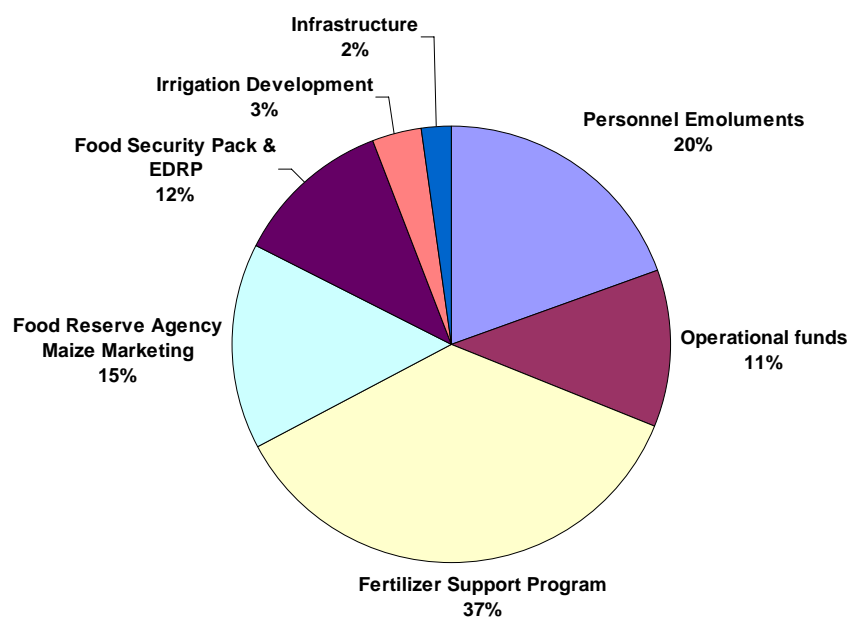
1. Target relatively poor farming households
  - This will minimize displacement and have the most direct effect on poverty reduction
2. Target FSP to areas where private traders are not already active (use PHS data to determine areas)
3. Reduce recommended fertilizer application levels – 200kg Compound D + 200kg Urea appears to be in stage 3 of production function
4. Prioritize R&D to generate improved fertilizer-responsive seeds
5. Open regional trade (especially in good harvest years) will raise and stabilize the price of maize → improve profitability of using fertilizer on maize

## IFPRI review of rate of return studies:

	Returns
Subsidies	Negative – 12%
Investments	
- research & extension	35% to 70%
- roads	20% to 30%
- education	15% to 25%
- communications	10% to 15%
- irrigation	10% to 15%

**If we believe these findings, they have major implications**

## Budget allocation to Agricultural Sector in Zambia: ZMK465 million in 2005



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- As massive as the poverty problems are now, they will be much greater unless budgets are re-allocated sooner or later to investments that will make the economy productive in the long-term:
    - Population growth w/o productivity growth → civil strife
    - Not a viable option to have more and more “fragile” or “failed” states

## Upshot for supporting CAADP

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1. Continue to support local and regional policy processes for helping governments make appropriate policy choices
2. Be more concrete about which kinds of public investments are needed, and which are not
3. Capacity strengthening for
  - COMESA itself
  - Regional policy networks
  - National governments through local capacity building
4. Indirectly coordinate with other donors (e.g., to be more selective about budget support)



Thank you

<http://www.aec.msu.edu/fs2/>