Fertilizer in Ethiopia:
Policies, Achievements, and Constraints

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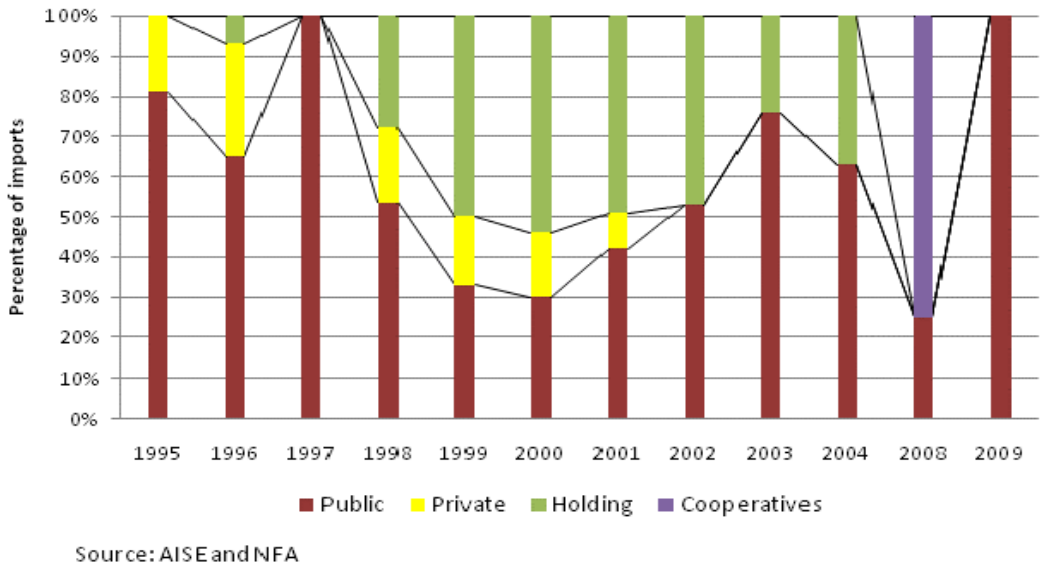
Outline

- Overview of policy evolution
- Fertilizer use
- Cost build ups
- Profitability
- Emerging policy challenges
  - Interaction with other public policies
  - Infrastructural constraints

Policy evolution

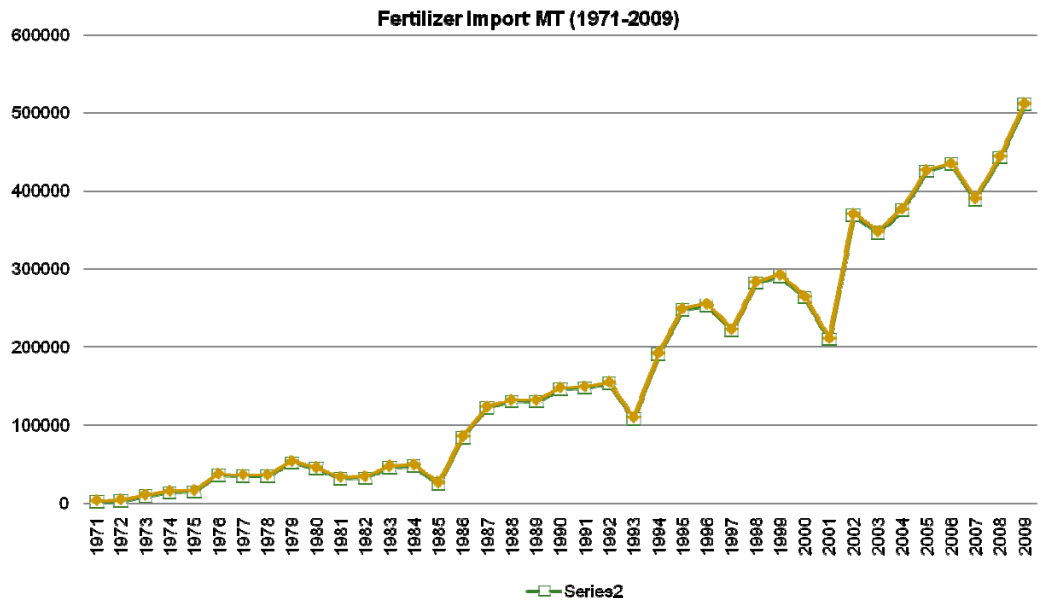
Period	Key Actors	Market shares
1971-1992	Complete government control	100 percent
1992-1998	Government (AISCO) & Holding company (1) Private company (1)	Government (> 60 percent) Private (<40)
1998-2002	Government & Holding company (4) Private companies (4)	Holding companies from other regions enter market gradually claim majority share (more than 50%) ➔Private companies gradually exit
2003-2006	Government Plus Holding companies Cooperatives	Government re-claims it dominance
2007-08	Government Plus Cooperatives	Cooperative claims 75 % of the market share
2008/09	**Government imports (100 %)**	**Yet to be determined GoE imported for its own distribution + on behalf of cooperatives**

Changing policies and market structure



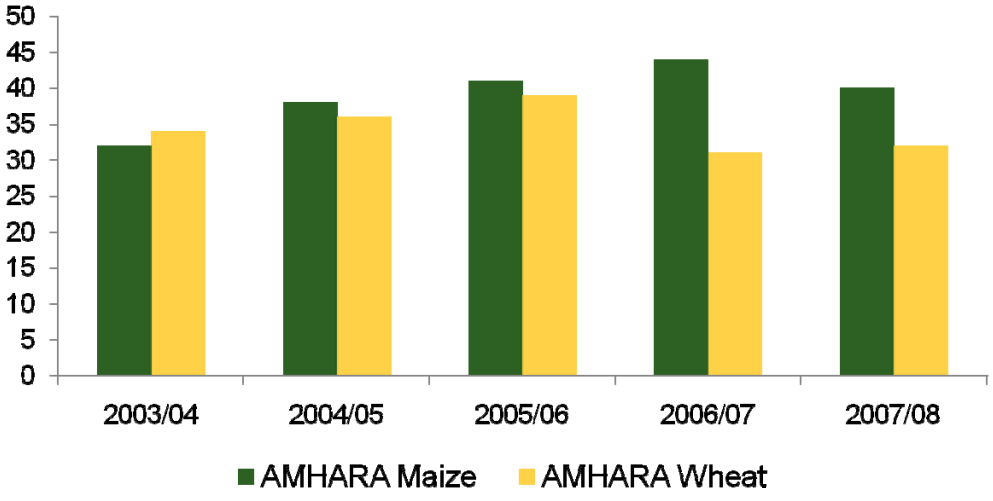
Source: AISE and NFA

Domestic availability of fertilizer (DAP and Urea)



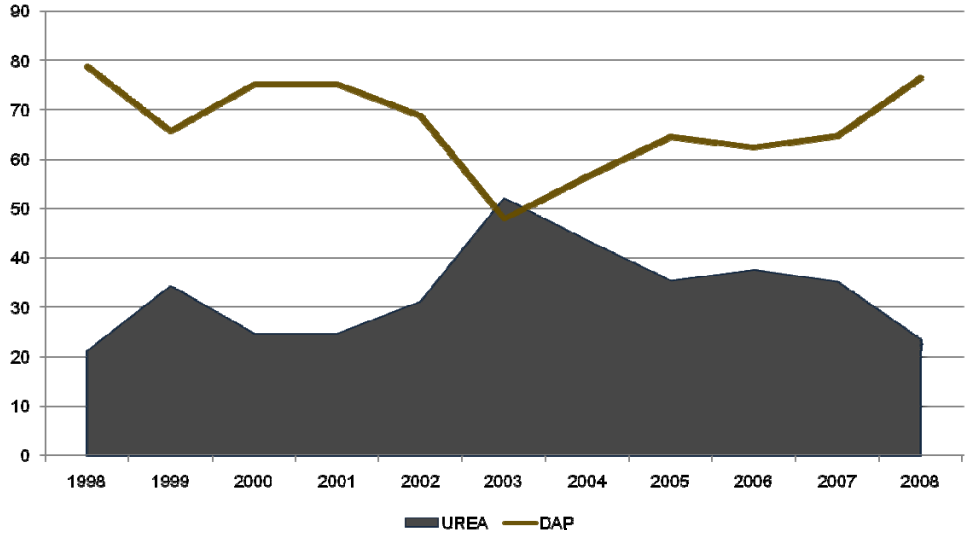
Fertilizer use (crops)

- Focus in on cereals

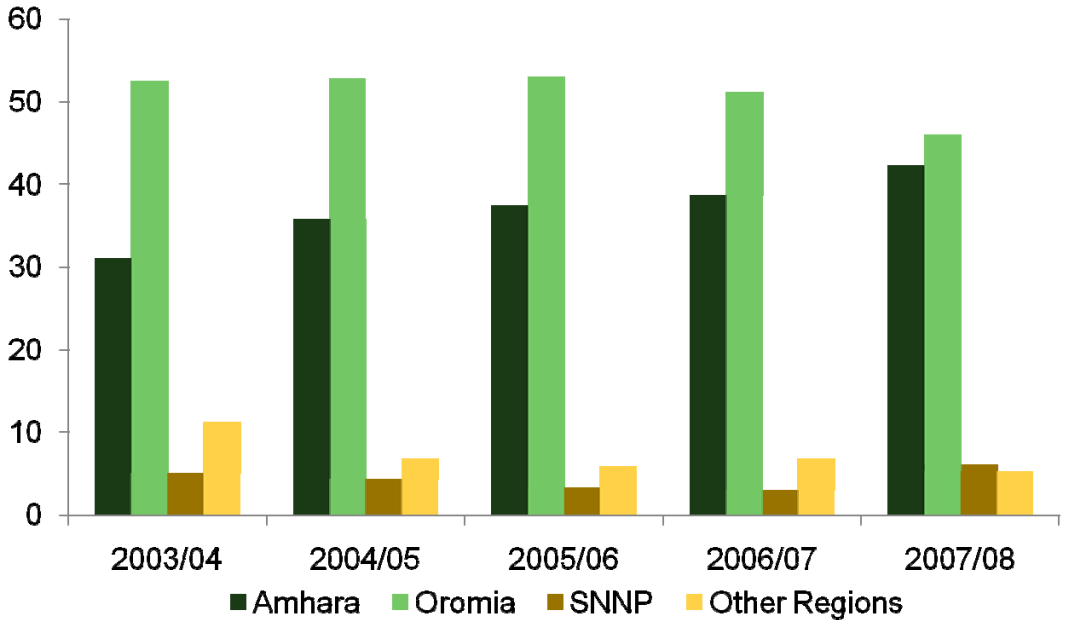


Fertilizer use (Types)

- Fertilizer use limited to DAP and Urea



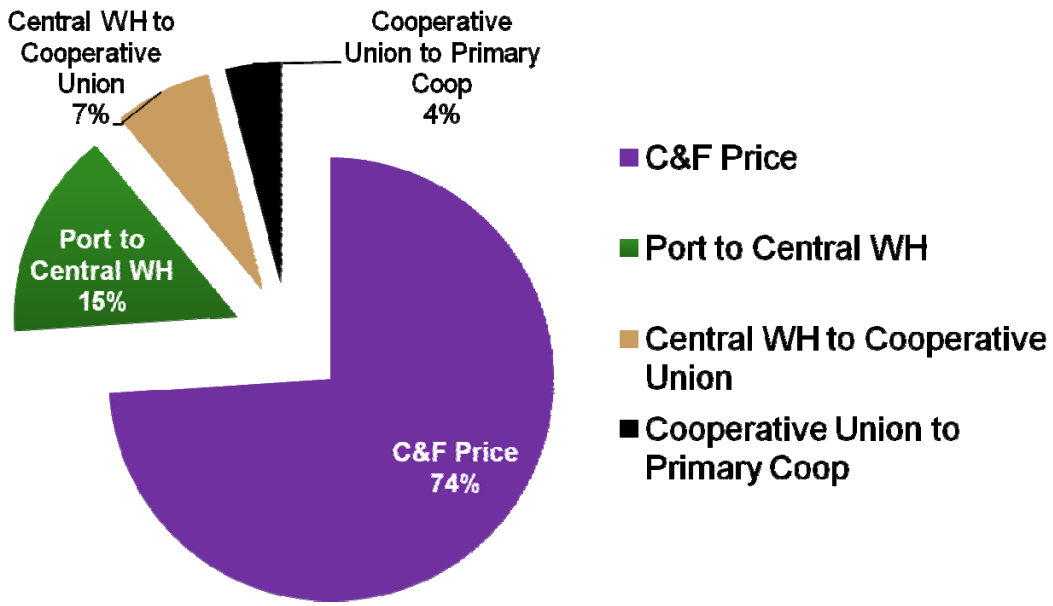
Fertilizer use (regional focus)



Fertilizer cost build ups

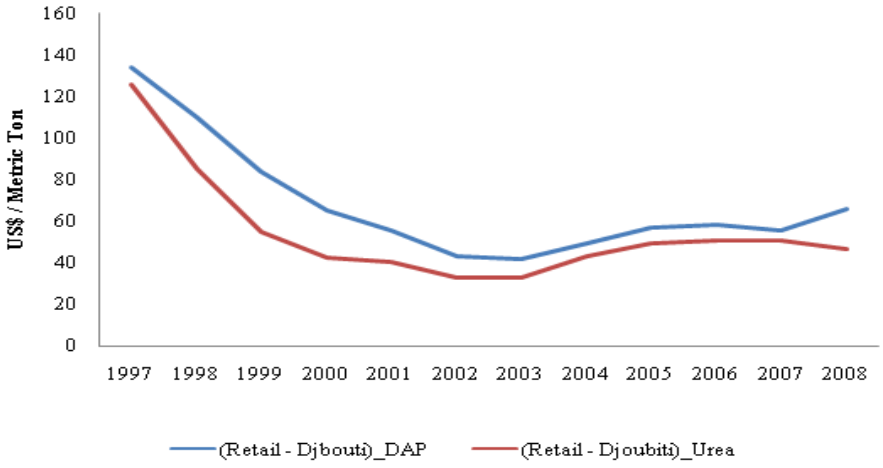
S. No.	Cost element	DAP Birr/MT	DAP US$/MT	UREA Birr/MT	UREA US$/MT
1	c. & f.	5,924.70	537.72	4,048.50	367.44
2	Insurance	8.00	0.73	8.00	0.73
3	Clearing and transit	30.00	2.72	30.00	2.72
4	Bank charge (1.25% on c. & f. for 4 months)	24.69	2.24	50.61	4.59
5	Quality control and bagging (0.2 % on c. & f.)	11.85	1.08	8.10	0.73
6	Interest cost for 1.5 month (6.25 % on c. & f.)	46.29	4.20	253.03	22.97
7	Operating cost (8.4% on c. & f.)	497.67	45.17	340.07	30.87
8	Over head cost	7.50	0.68	7.50	0.68
9	Loss or spoilage	18.30	1.66	9.60	0.87
10	Distribution cost to warehouses				
	Average inland transport to ware house (per kilometer per quintal is ETB .08)	209.00	18.97	91.60	8.31
	Unloading	15.00	1.36	15.00	1.36
11	Selling price at				
	Addis Ababa warehouse	6,792.90	616.52	4,862.00	441.27
	Natherate warehouse	6,792.90	616.52	4,862.00	441.27
	Shashemene	6,919.30	627.99	4,988.40	452.75
12	Transport cost from warehouse to cooperatives (per kilometer per quintal)	234.60	21.29	361.00	32.76
13	Loading and unloading	12.50	1.13	12.50	1.13
14	Administrative cost	25.00	2.27	25.00	2.27
15	Union selling price to primary cooperatives	7,191.40	652.69	5,260.50	477.44
16	Bank interest (8.5% on no. 15)	152.80	13.87	111.80	10.15
17	Administrative cost	20.00	1.82	20.00	1.82
18	Loading and unloading	25.00	2.27	25.00	2.27
19	Service charge	50.00	4.54	50.00	4.54
20	**Selling price of primary cooperatives to farmers**	**7,439.20**	**675.18**	**5,467.30**	**496.21**

Fertilizer cost build ups, 2009

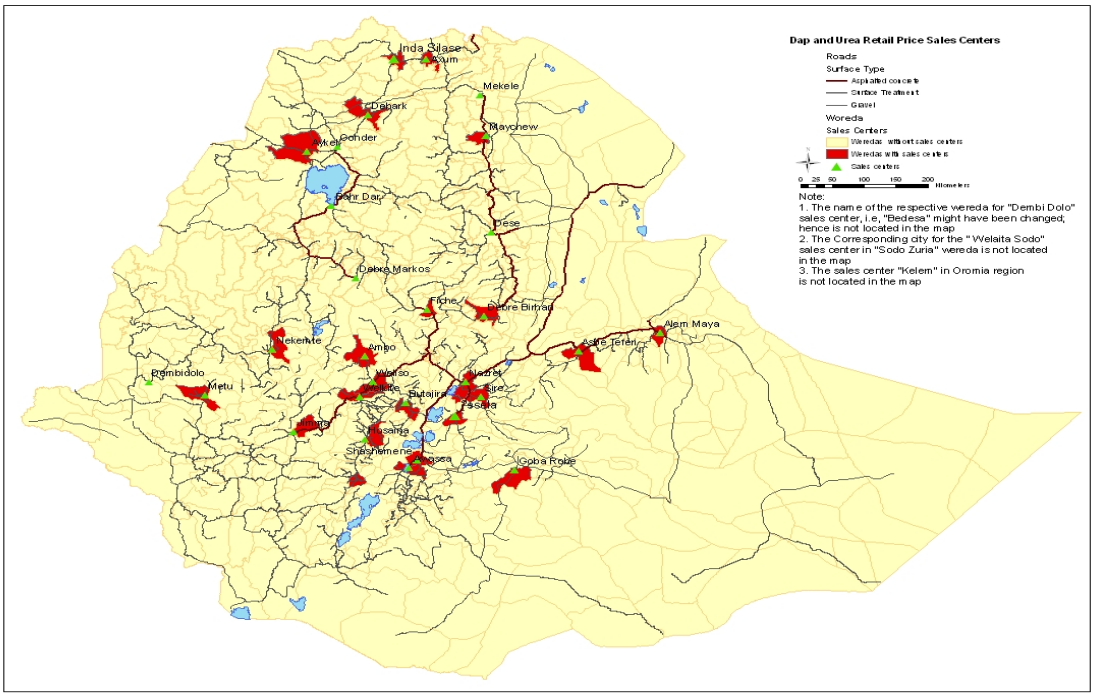


Trends in domestic marketing cost

If domestic marketing costs remained at 1997 level, farmers would have to pay $60 / ton!!!



Fertilizer distribution centers



Fertilizer profitability

- Three different methods
  - VCR
  - PRRA / case studies
  - Survey based

Profitability (VCRs)

Crop	Country	year	VCR	Source
Maize	Ethiopia	1992	4.2	Mulat et al, 1997
Maize	Ethiopia	1997	1.4	Mulat et al, 1997
Maize	Ethiopia	2008	1.8-4.0	EIAR / IFPRI
Maize	Kenya	1994	1.3-6.7	Keisey & Mwangi, 1997

Case study of maize profitability

	Profitability of fertilizer Maize technology-Case Wolita Zone		
		Local Variety	Hybrid
1	**Maize yield kg/ha**	2000	5000
	Price of Maize Birr/Kg	3.5	3.5
	Gross return	6500	15000
2	**Variable costs**		
	Seed (kg/ha)	40	25
	Price Birr/Kg	2	6
	seed cost Birr /ha	80	150
2.1	**Fertilizer**		
2.1	Dap (kg/ha)	100	100
2.2	DAP Cost / ha	760	760
2.3	Urea (g/ha)	50	50
2.4	Urea cost /ha	565	565
	Total costs (2+2.1)	1405	1575
	Net margin /ha	5095	13425
	MRR (MR/MC)= MR	490%	

Survey based (maize yields (qt/ha))

	Fertilizer users	Fertilizer non-users	t-value
Tigray	15.06	13.59	0.642
Amhara	18.38	14.38	2.044**
Oromia	16.52	11.03	3.365***
SNNP	9.74	8.01	0.128
All	16.96	12.16	5.68***

Source: Authors' calculations from EAMHS data, 2008
Note: Averages are computed for positive producers; ** significant at 5%; significant at 1%

Ethiopia: Fertilizer – Yield Response Elasticities

Use type	Commodity type	Elasticity estimates
Estimates of this Study		
Fertilizer + improved seed	Maize (A)	0.26 - 0.35
Fertilizer only	Maize (A)	0.16 - 0.18
Estimates from other studies		
	Cereals(B)	0.198
	Cereals (C)	0.051- 0.095

Source:
(A): Estimates using EAMHS, 2008
(B): Cropponsted, A. and A. Mamo (1996), 'Analysis of the Productivity and Technical Efficiency of Cereal Growing Farmers in Ethiopia,' Mimeo, Centre for the study of African Economies, Oxford University.
(C): Yao, S. (1996), 'Determinates of Cereal Crop Productivity of the Peasant farm sector in Ethiopia, 1981-87', *Journal of International Development*, 8: 69-82.

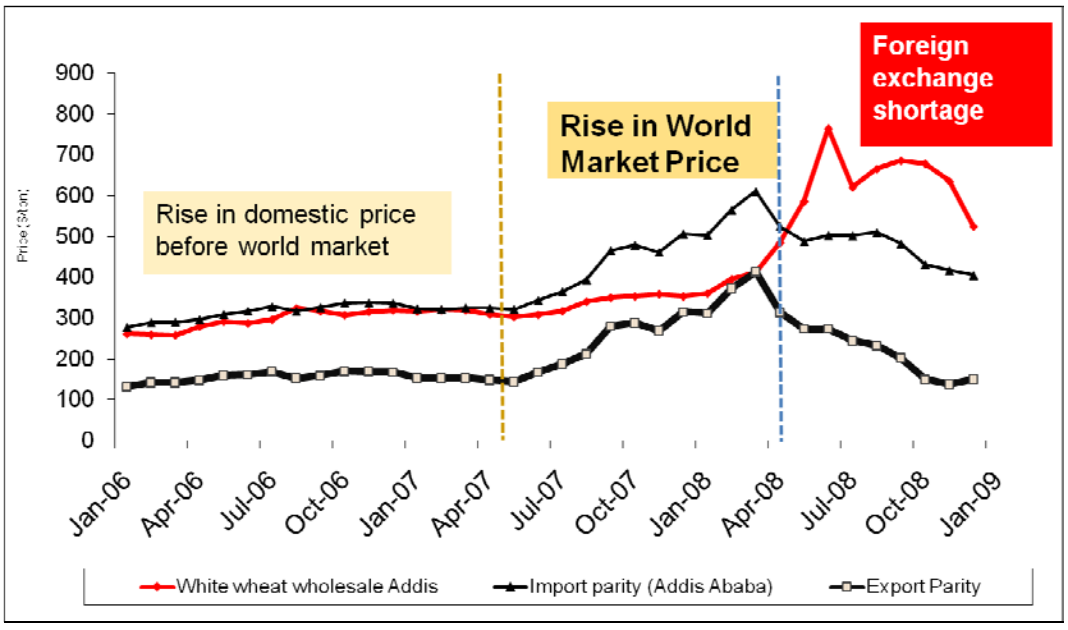
Is fertilizer profitable?
Let's do some math

- **Our elasticity estimate is=0.26. This means:**
  - 10% increase in fertilizer use →2.6% increase in yield responses
- **Average fertilizer use is 80kg/ha. Using our elasticity estimate:**
  - 10% increase in fertilizer use→8kg/ha additional use of fertilizer
  - Cost of additional fertilizer = 8*4 = 32 Birr
- **Average yield is 1700kg/ha. According to our elasticity estimate:**
  - 2.6% increase in additional output→44.2kg/ha
  - Additional value of extra production → 44.2*2.5 = 110.5 Birr
- **Extra revenue due to fertilizer 110.5 – 32 = 78.5 Birr**

The policy interactions

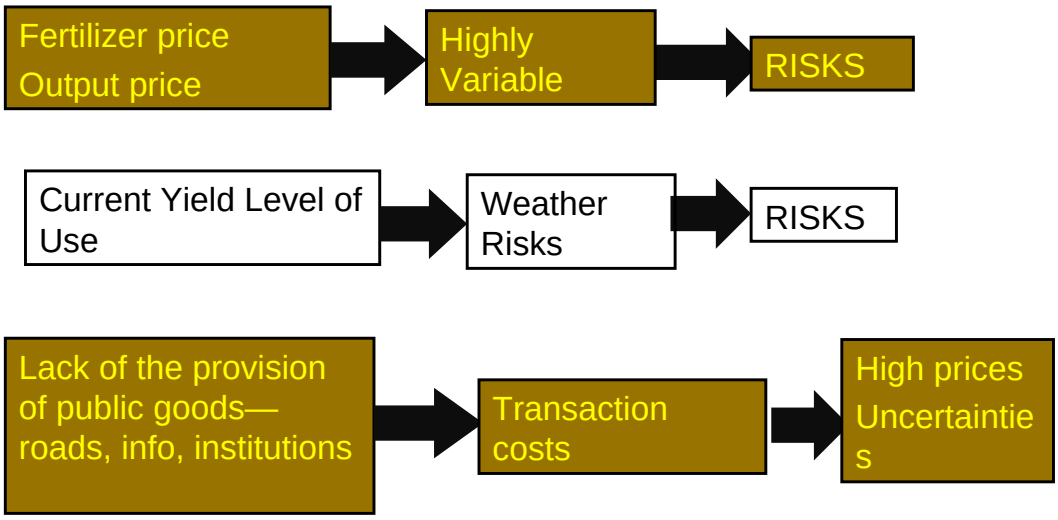
- Three examples
  - Market collapse in 2003
  - Rising cereal prices from 2006
  - Exchange rates / Balance of Payment

Price & macroeconomic policies



Fertilizer demand and supply

- Key factors behind fertilizer profitability



THANK YOU!!!