



# Structural Changes in the Sugar Market and Implications for Sugarcane Smallholders

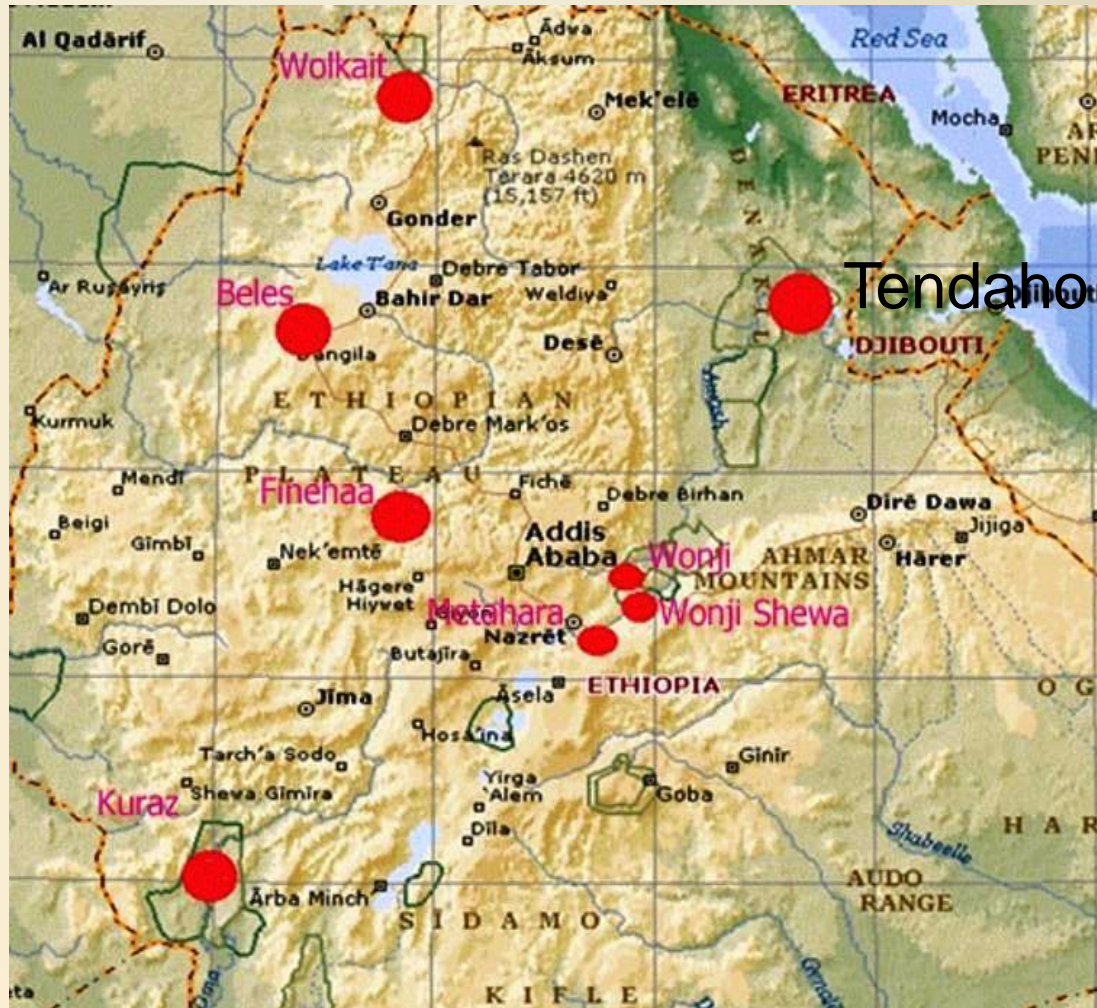
Determinants of Revenue Growth  
in Sugar Sector: FAO case  
studies in Ethiopia and Tanzania

# Overview: Ethiopia



- Has 8 sugar factories but large 3 functioning (Metahara, Finchaa, Wonji) under extension; low yields; low production growth;
- Faces fast rising domestic demand (population 85 mln now and 174 mln in 2050; urbanization);
- Aims to increase capacity from 350 to 800 thousand tons/year by 2015: New factory/plantation in Tendaho; Expansion in Wonji; (limited market integration).
- Maintains state-run sugar sector: quasi-fix farm/labor prices
- Employs mostly small farmers and workers (several hundred of thousands)

# Ethiopia Sugar Map



# Overview: Tanzania



- There are 4 companies processing sugar, all located in areas most suitable for sugarcane production.
- Direct and indirect employment associated with sugar reaches up to 150 000 people.

# Research questions?



- How changes in world and local sugar policies will affect small stakeholders' livelihood?
- What is the main determinant of revenue growth?
- How expansion Ethiopia: (outgrowers, relocation issue)?
- How to resolve Ethiopia Complex policies?

# Objectives



- Focus on the link between global/national policy and small stakeholders' earnings
- Estimate (quantify) the impact of market changes on small farmers/workers income and wage
- Draw implication on the main determinant of revenue growth

# Approach



- Household surveys:
- Estimation (Econometrics)
- Simulation

# Results: Ethiopia



Statistical averages from household data ( 1 USD= 18 birr)

	Wonji	Tendaho	
<b>Total income (birr)</b>	37,127	20,952	
<b>Sugar Income (birr)</b>	11,134	6,219	
<b>sugar farming income (birr)</b>	5,812	0	
<b>sugar labor income (birr)</b>	5,322	6,219	
<b>Crop land return (birrs/ha)</b>	10,076	1,414	
<b>Sugar</b>	4,310	0	
<b>crops return other than sugar (birr/ha)</b>	26,250	1,414	
<b>Income from livestock production (birr)</b>	2,724	7,270	



# Results: Ethiopia



Statistical averages from household data ( 1 USD= 18 birr) contd

	Wonji	Tendaho	
Income from livestock production (birr)	2,724	7,270	
Land holding (hectares)	2.8	1.8	
Allocated to sugar (hx)	1.6	0	
Total livestock unit equivalent	3.7	9.8	
Family size	6.5	5.1	
Age of the head of household	47.5	37.9	
Number of years of education	2.1	1.1	
Total number of households	120	120	

# Results: Ethiopia

## Wonji household model



	Dependent Variables		
	Income per household	Income per capita	
<b>Independent variables (in log forms)</b>			
Price index of crops other than sugar	0.49 (6.89)	0.46 (6.08)	
Sugar acreage share	-0.31 (-2.81)	-0.35 (-2.99)	
Wage received in the sugar sector (per year per person)	0.04 (0.41)	0.55 (5.63)	
Age of household head	0.32 (1.98)	0.12 (0.76)	
Nb. of years of education	0.11 (1.78)	0.07 (1.07)	
Total livestock unit equivalent	0.02 (0.41)	0.01 (0.23)	
Constant	3.7 (3.17)	-0.30 (-0.25)	

# Results: Ethiopia

Ex-ante assessment of effects of the expansion of sugar production in Tendaho using matching technique ( birr)



	Average Treatment Effect of the whole sample (ATE)	Average Treatment Effect of the Treated (ATT)	Average Treatment Effect of the Control (ATC)
<b>Effects on:</b>			
<b>Total income per household</b>	11,659 (3.47)	18,561 (5.78)	4,757 (1.12)
<b>Income per capita</b>	3429 (5.14)	3262 (5.59)	3596 (3.94)
<b>Sugar labor income per capita</b>	1183 (2.63)	-186.50 (-0.64)	2553 (4.17)
<b>Share of sugar labor income</b>	-0.14 (-3.53)	-0.24 (-5.27)	-0.06 (-1.20)
<b>Crop land return per hectare</b>	8619 (11.78)	9030 (10.68)	7981 (9.9)
Nb. observation	240	120	120

# Results: Tanzania

Survey data



- A total of 109 farmers participated in the field survey for this review.
- About 40% of household earn less than USD 3 a day, while average income for 20% of them was less than USD2.2 a day.
- Total land allocated to sugarcane remains relatively small. 66% of respondent set an area between 1 to 5 hectares to sugarcane.

# Results: Tanzania



<b>Dependent Variable:</b>	<i>Household income</i>	
<b><i>Explanatory variables :</i></b>		
Sugar acreage share	0.29*	(2.23)
Price index of crops other than sugar	0.16*	(2.27)
Assets	0.47*	(2.93)
Price of cane	0.29*	(2.30)
Age of household head	0.57**	(1.65)
Off-farm work	-0.39*	(-2.36)
Farm expenses	0.18*	(3.88)

# Results: Tanzania



- These findings imply that increasing the share of sugarcane in total land area leads to increases in household income.
- They also suggest that sugarcane activity has the largest impact on smallholders' livelihood, in comparison to other activities. In particular, poor households, those with earnings of less than USD 2.8 per day, could see their income improve provided mechanisms are in place to facilitate access to additional land (they currently own less than 2.8 hectares of land), and capital to maximize the use of land.
- Indeed, allocative efficiency analysis showed that marginal value product of both land and capital was lower than their respective unit cost.

# Simulation analysis



1. EBA: impact of the EU initiative DFQF
2. Increased global demand for sugar, most notably in Asia
3. Impact of developing a biofuel sector in Tanzania and Ethiopia
4. Effect of higher energy prices

# Simulation results



		Simulation	Baseline	Average change %
<b>Simulation 1 (EBA)</b>	Ethiopia	458.46	396.45	13.53
	Tanzania	107320.11	74919.79	30.19
<b>Simulation 2 (Demand increase)</b>	Ethiopia	464.15	458.46	1.24
	Tanzania	108914.06	107320.11	1.49
<b>Simulation 3 (developing biofuel)</b>	Ethiopia	458.67	458.46	0.04
	Tanzania	128291.35	107320.11	19.54
<b>Simulation 4 (Energy price increase)</b>	Ethiopia	496.76	458.46	8.35
	Tanzania	112829.81	107320.11	5.13



# Implications



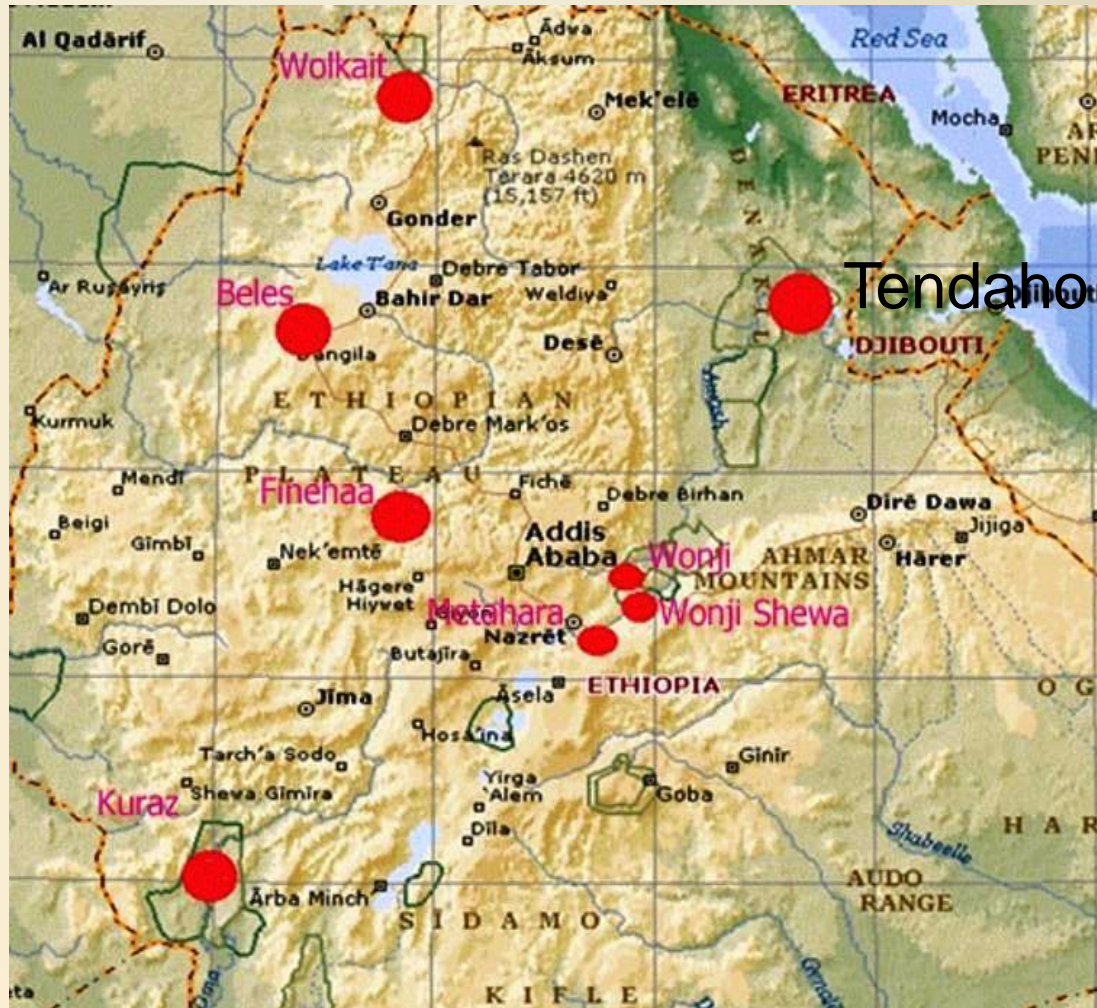
- Policy making is already complex from macro to micro; should not be complicated much further
- Priority, consistency required; no magic recipe
- Even well-designed, well-meaning policy do not always work (because of external factors: land use/right issues; weather; conflicts)
- Specifically: Extension of farming, milling capacity in LDC requires careful evaluation

# Conclusions



- Key determinants of revenue growth are:
  - Producer price flexibility and land use (lands property rights; opportunity cost)
  - Both land and labor productivity are important
- Required:
  - Institutional supports (platform for dialogue and negotiation) to be strengthened
  - Prioritization, (clearer, better, more consistent policies)

# Ethiopia Sugar Map





# *Vinaka Vaka Levu*