

# Household Incomes and Poverty Dynamics in Rural Kenya: A Panel Data Analysis

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*Presentation at the at the Economics of Global Poverty Conference, Gordon College, Boston, USA*

*January 6-7, 2015*

# Background [I]

- The goal of economic policy in Kenya since 1963
  - Mobilization and efficient use of resources to achieve high economic growth to reduce poverty and food insecurity
- **National Poverty Eradication Plan (NPEP) -- 1998**
- **Poverty Reduction Strategy Paper (PRSP) -- 2001**
  - Medium Term Expenditure Framework (MTEF) budgeting system -  
- 2000/01
- **Economic Recovery Strategy for Wealth and Employment Creation (ERS) -- 2003**
  - Constituency Development Fund (CDF); Local Authorities Transfer Fund (LATF)
- **Kenya Vision 2030 -- 2008**

## Rural Absolute Poverty in Kenya by Region According to the 2005/06

Province	Headcount ( $P_{\alpha=0}$ )	Poverty Gap ( $P_{\alpha=1}$ )	Poverty Severity ( $P_{\alpha=2}$ )	Contribution – head count (%)
Central	30.4	9.5	4.5	9.0
Coast	69.7	26.6	13.2	10.1
Eastern	50.9	17.8	8.7	20.3
North eastern	73.9	32.9	17.8	4.6
Nyanza	47.6	16.8	8.0	14.7
Rift Valley	49.0	17.5	9.4	26.7
Western	52.2	18.3	8.6	14.7
Total-rural	49.1	17.5	8.8	100

Source: Kenya Integrated Household Budget Survey 2005/06

## Background [II]

- Failure of poverty reduction efforts has been attributed to a number of factors:
  1. Lack of empirical evidence to inform poverty reduction strategies
  2. Lack of commitment to poverty eradication
  3. Lack of implementation of the formulated poverty reduction plans

# Study objectives

- Policy makers have focused on reducing the national aggregate poverty incidences
- However, most of the poor are not poor all times
  - There is movement in and out of poverty
- The objective of this study is to examine the factors that influence household welfare pathways over time

# Data [I]

- The study uses household panel data collected through surveys in 2000, 2004 and 2007
- Whereas the original sample consists of 1500 households, only 1299 households consistently remained in the sample in 2000, 2004 and 2007
  - The attrition arose mainly as a result of dropping North Eastern region due to security risks and migration
  - Jin and Jayne (2011) found that the observed attrition in other regions was largely random (no selection bias but efficiency loss)

## Data [II]

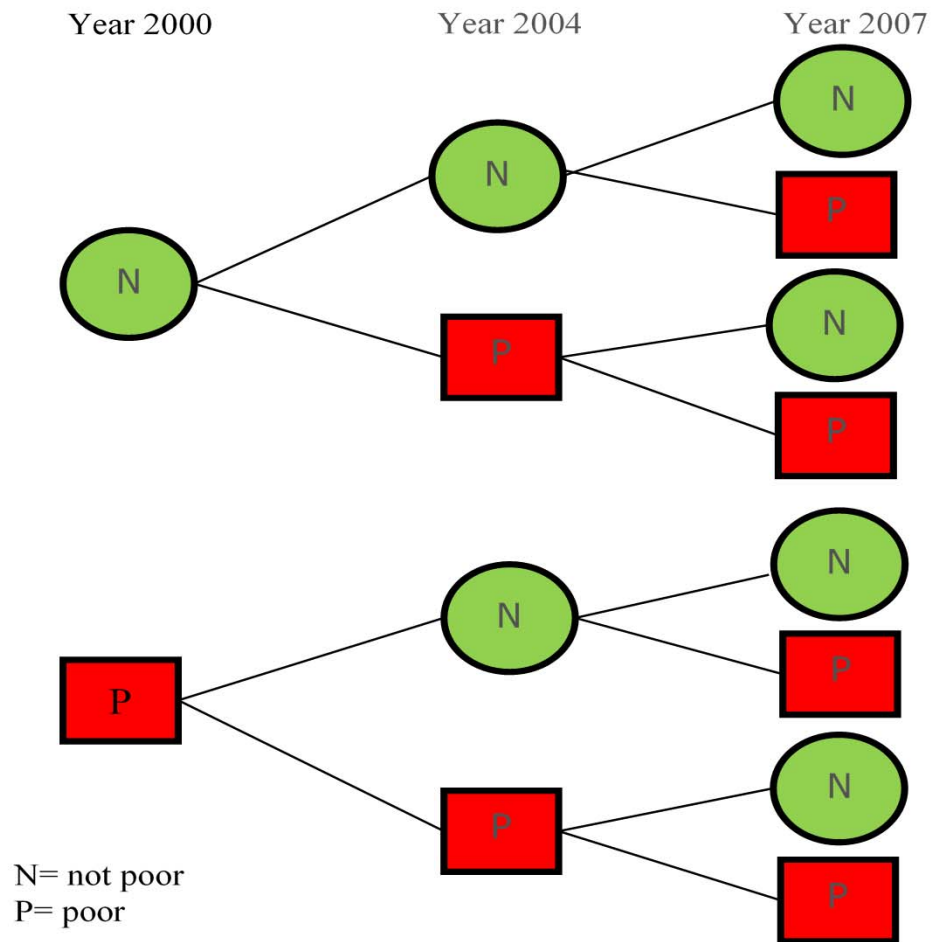
- Household income per adult equivalent is used as measure of wel(ill)fare
  - Data on consumption was not available
- Household income is the sum of farm and off-farm income including remittances
- Income was deflated by the CPI
- Food poverty line for 2007 was KSh1598/month (KSh19,176/year)
  - Cost of consuming 2250 kilocalories per day per adult

# Data analysis

- **Descriptive analysis:**
  - Transition matrices
  - Non-parametric regressions
- **Econometric analysis:**
  - **Determinants of households incomes**
    - Correlated random effects model (CRE)  
$$y_{it} = \mathbf{X}_{it}\beta + c_i + u_{it} ; t = 1, 2, 3; i = 1, 2, \dots, N$$
$$c_i = \overline{\mathbf{X}}_i\theta + \varepsilon_i; \quad \varepsilon_i | \mathbf{X}_i \sim N(0, \delta_\varepsilon^2); \quad i = 1, 2, \dots, N$$
  - **Determinants of household wel(ill)fare pathways**
    - Sequential Logit Model



# Wel(ill)fare pathways



# Table 1: Transition Matrix for Real Income Quintiles (2000-2004)

		Income quintiles in 2004					Total
		1 (Lowest)	2	3	4	5 (Highest)	
Income quintiles in 2000	1 (Lowest)	104 (40%)	76 (29%)	44 (17%)	26 (10%)	9 (4%)	259 (100%)
	2	78 (30%)	77 (30%)	54 (21%)	32 (12%)	19 (7%)	260 (100%)
	3	38 (15%)	52 (20%)	70 (27%)	64 (25%)	36 (14%)	260 (100%)
	4	25 (10%)	37 (14%)	57 (22%)	77 (30%)	64 (25%)	260 (100%)
	5 (Highest)	14 (5%)	18 (7%)	35 (14%)	61 (24%)	132 (51%)	260 (100%)
	Total	259 (20%)	260 (20%)	260 (20%)	260 (20%)	260 (20%)	1299 (100%)

## Table 2: Transition Matrix for Real Income Quintiles (2004-2007)

		Income quintiles in 2007					Total
		1 (Lowest)	2	3	4	5 (Highest)	
Income quintiles in 2004	1(Lowest)	120 (46%)	66 (26%)	46 (18%)	24 (9%)	3 (1%)	259 (100%)
	2	74 (29%)	78 (30%)	57 (22%)	38 (15%)	13 (5%)	260 (100%)
	3	37 (14%)	62 (24%)	73 (28%)	65 (25%)	23 (9%)	260 (100%)
	4	19 (7%)	40 (15%)	56 (22%)	73 (28%)	72 (28%)	260 (100%)
	5 (Highest)	9 (4%)	14 (5%)	28 (11%)	60 (23%)	149 (57%)	260 (100%)
	Total	259 (20%)	260 (20%)	260 (20%)	260 (20%)	260 (20%)	1299 (100%)

Figure 2: Poverty headcount index by year (2000, 2004 and 2007)

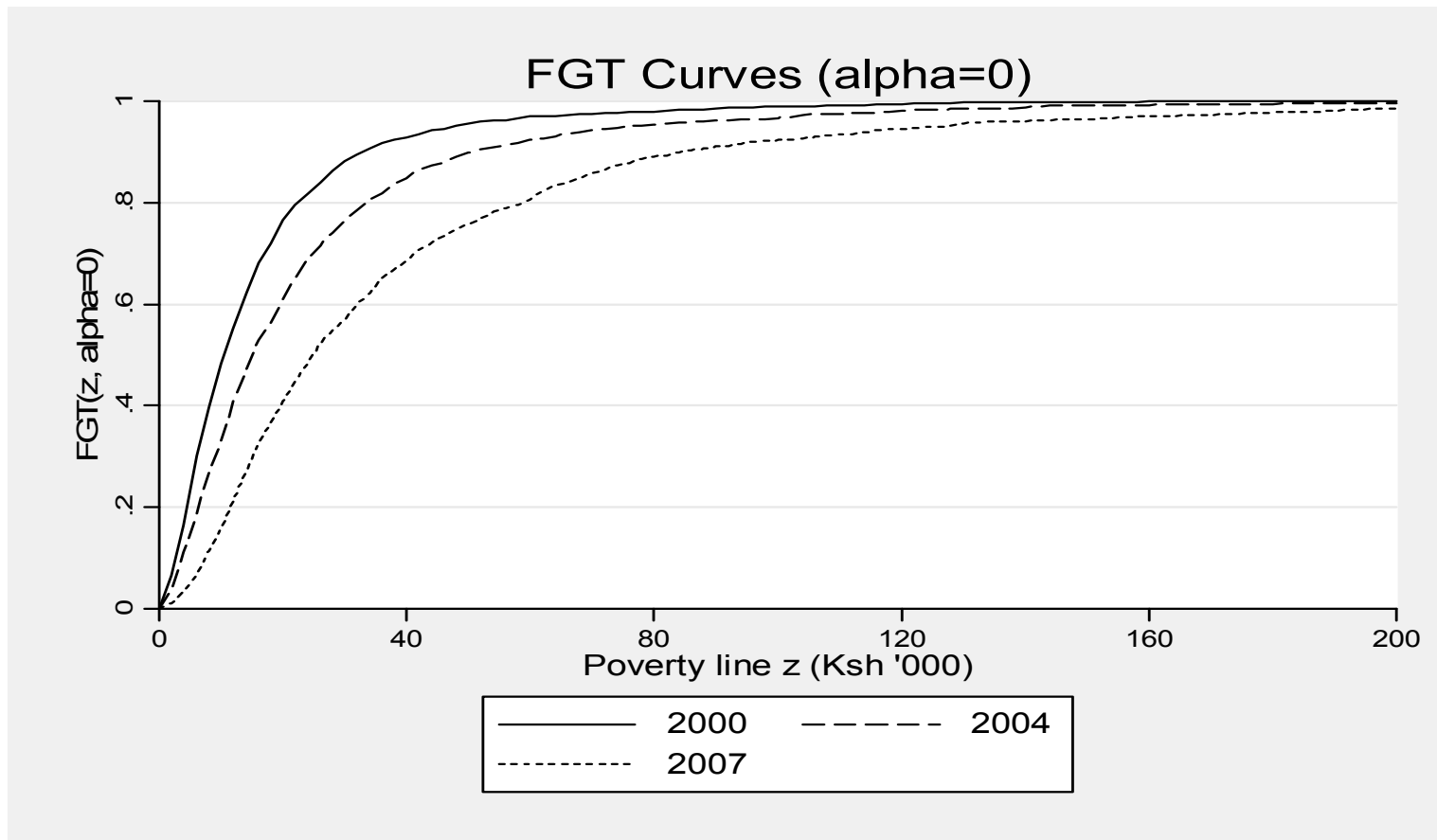


Figure 3: Poverty gaps by year (2000, 2004 and 2007)

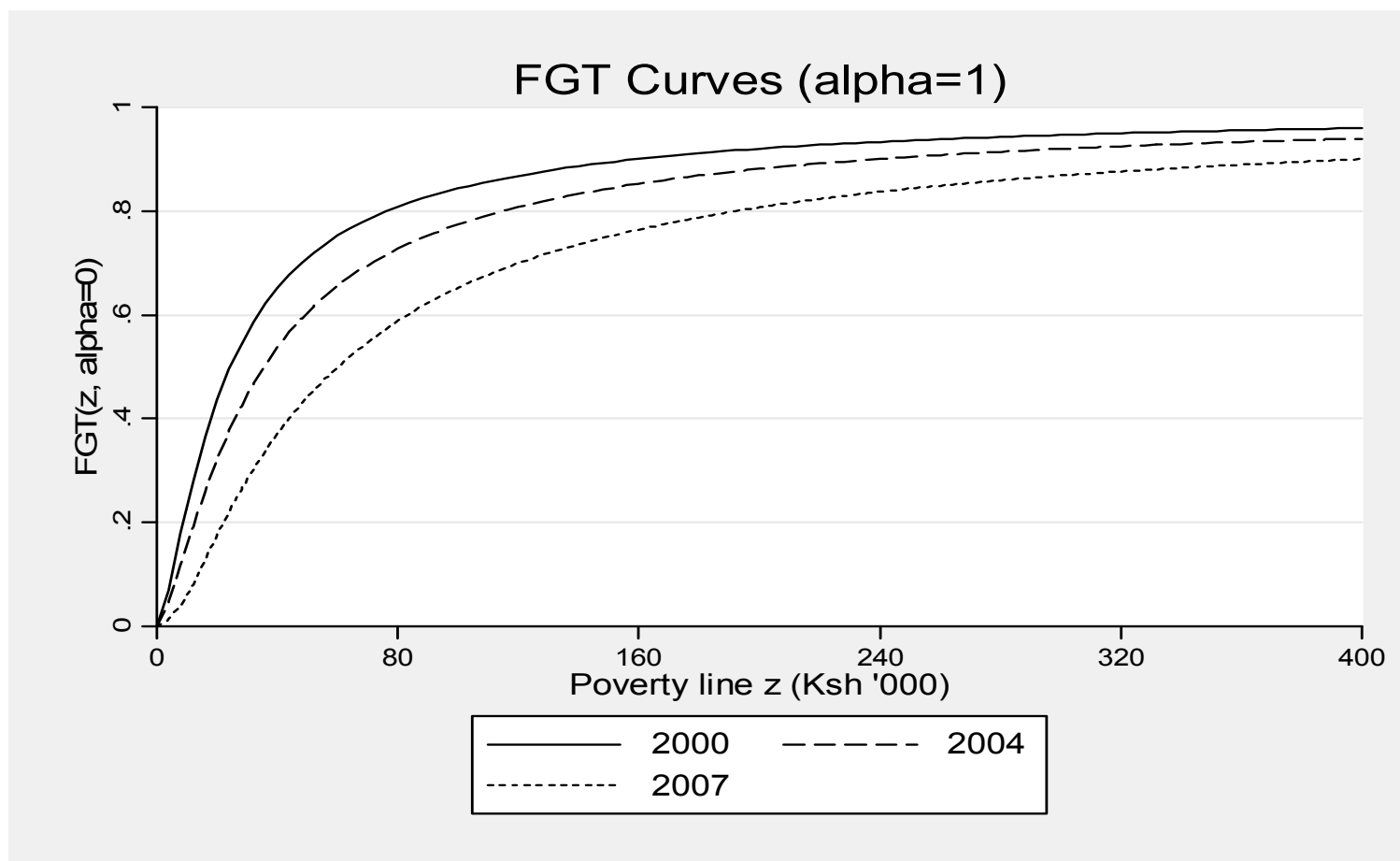
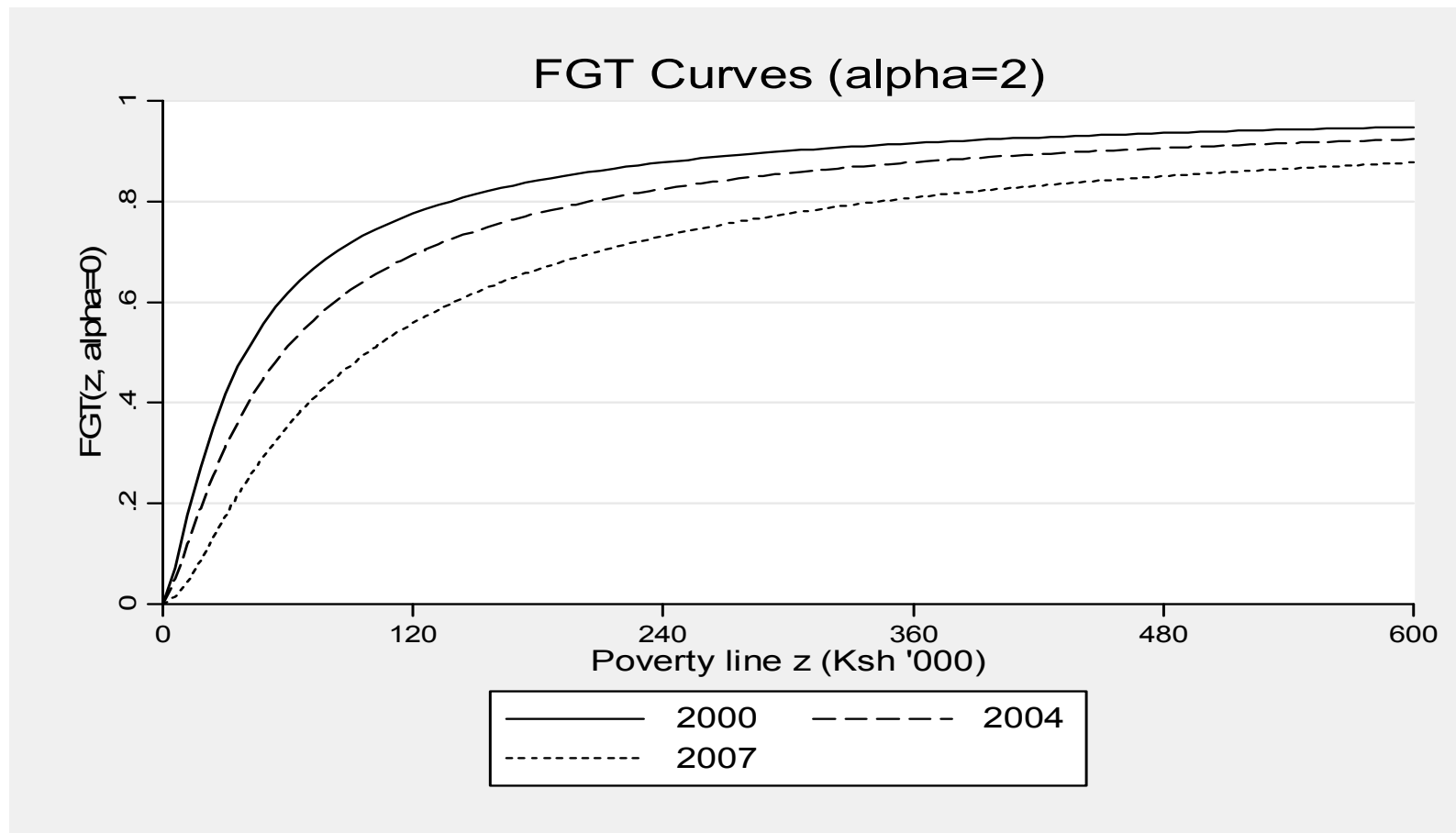


Figure 4: Poverty severity by year (2000, 2004 and 2007)



## Table 6: Poverty Spells (2000-2007) by Agro-Ecological Zones

Agro-ecological zones	Consistently non-poor		Poor- one spell		Poor two spells		Consistently poor		Sample	
	N	%	N	%	N	%	N	%	N	%
Coastal Lowlands	9	13	17	24	23	33	21	30	70	100
Eastern Lowlands	48	34	42	29	35	25	18	13	143	100
Western Lowlands	12	8	35	24	47	32	54	37	148	100
Western Transitional	33	22	50	34	40	27	25	17	148	100
High Potential Maize Zone	143	42	84	25	53	16	60	18	340	100
Western Highlands	24	19	31	24	32	25	41	32	128	100
Central Highlands	174	73	33	14	23	10	9	4	239	100
Marginal Rain Shadow	14	38	14	38	5	14	4	11	37	100
<b>Total</b>	<b>457</b>	<b>36</b>	<b>306</b>	<b>24</b>	<b>258</b>	<b>21</b>	<b>232</b>	<b>19</b>	<b>1299</b>	<b>100</b>

## Table 7: Correlated Random Effects Regression Results of Household Incomes (short run elasticities)

Dependent variable: log income	Coef.
<i>Gender and marital status of the head (monogamously married as base)</i>	
Single female	-0.101*
Per capita land holding (acres)	0.075***
<i>Distance to infrastructural facilities, services and markets (km)</i>	
Nearest electricity	-0.531***
Expected rainfall (10mm)	0.017***
Expected drought shock	-0.327***
<i>Region dummies (Central highlands as base)</i>	
Western lowlands	-0.082*
Eastern lowlands	-0.088***
Coastal lowlands	-0.094**
Marginal rain shadow	0.154***
<i>Survey year dummies (year 2000 as base)</i>	
y2004	0.111***
y2007	0.294***



## Table 7: Correlated Random Effects Regression Results of Household Incomes (long run elasticities)

Dependent variable: log income	Coef.
Dependency ratio	-0.212***
<i>Gender and marital status of the head (monogamously married as base)</i>	
Single female	-0.132**
<i>Level of education of the head (no formal education as base)</i>	
Post-secondary	0.278***
Per capita land holding (acres)	0.109***
<i>Distance to infrastructural facilities, services and markets (km)</i>	
Nearest motorable road	-1.361*
Nearest water source	-0.371*
Nearest electricity	-0.846***
Expected rainfall (10mm)	0.115***
Expected drought shock	-1.411***

## Table 8: Sequential Logit Regression of Results of Households Wel(ill)fare

	2000	2004		2007			
	N v. P	NN vs. NP	PN vs. PP	NPN vs. NPP	NNN vs. NNP	PPN vs. PPP	PNN vs. PNP
Dependency ratio	DEC		DEC			DEC	DEC
Status of HH head							
Single fem.	DEC			DEC			
Single male					DEC		
Education HH head							
Primary	INC						
Secondary & post-secondary	INC	INC	INC		INC	INC	
Per capita land holding (acres)	INC	INC	INC			INC	
Distance to nearest (km)							
Fertilizer seller	DEC	DEC					
Motorable road					DEC		DEC
Healthcare Facility			DEC				
Electricity	DEC	DEC		DEC	DEC	DEC	DEC
Expected rainfall (10mm)	INC	INC				INC	INC
Expected drought shock	DEC	DEC	DEC				
Zone							
Western lowlands	DEC						
Eastern lowlands	DEC	DEC		DEC	DEC		DEC
Coastal lowlands	DEC			DEC	DEC		

# Conclusions

- The results reveal considerable variation in regional welfare dynamics over time in rural Kenya, but with overall decreasing poverty levels between 2000 and 2007
- Household welfare dynamics are associated with:
  - Demographic factors -- dependency burden, gender and educational attainment
  - Access to land
  - Access to physical infrastructure and markets
  - Rainfall and rainfall shocks