



West African Futures

SETTLEMENT, MARKET AND FOOD SECURITY

**A RETROSPECTIVE AND COMPARATIVE
ANALYSIS OF FOOD CRISES AND FOOD
INSECURITY IN THE REGION**

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2nd Working Group Meeting, 27-28 Oct. 2011

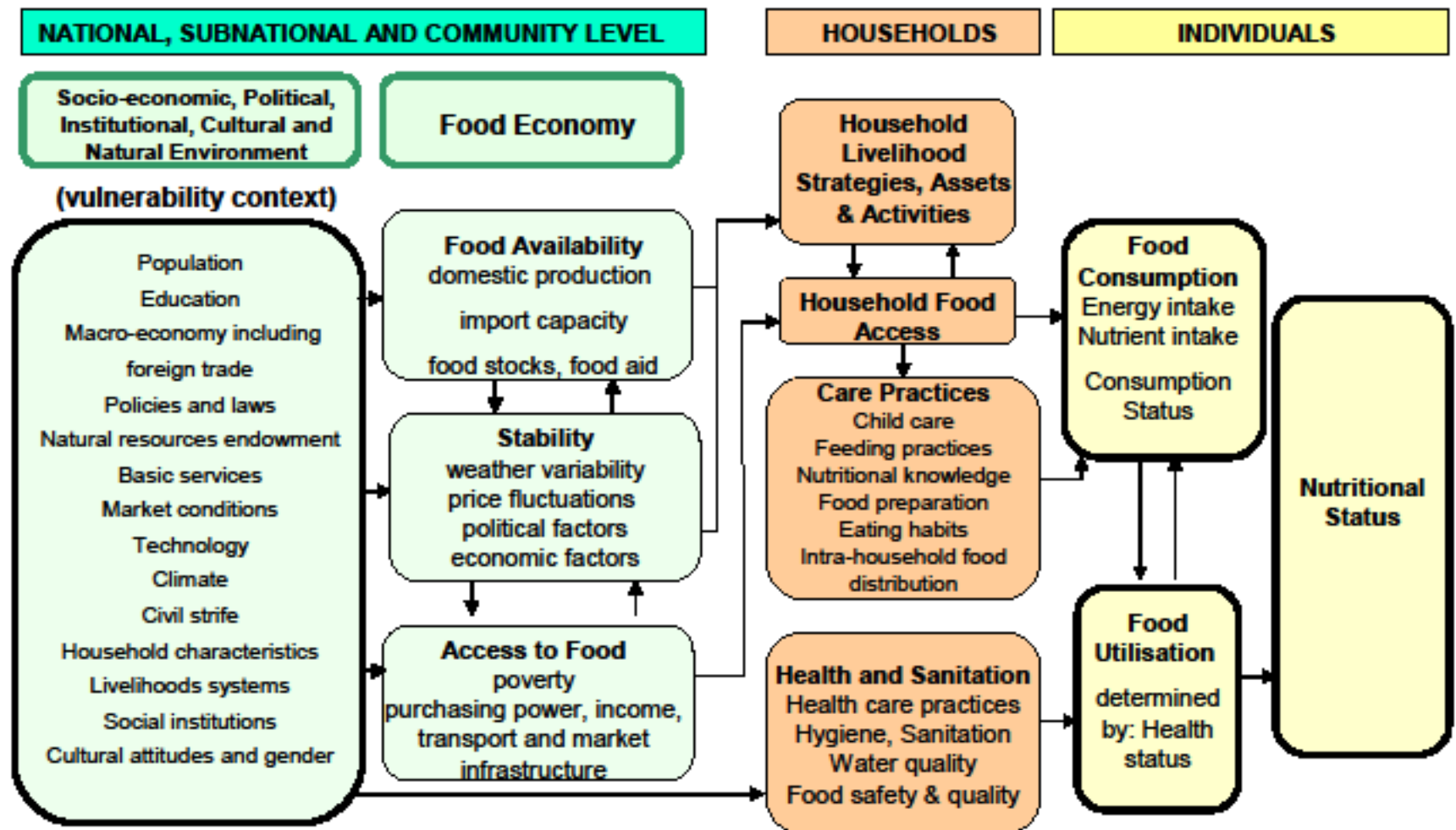
Overview

- 50-year Retrospective, Comparison with S.E.

Asia

- FAO Food Security Analysis Framework
- Prevalence of Undernourishment
- Crises and other Explanatory Variables
- Index of Vulnerability to Food Insecurity
- Links to Climate Change, Regional Trade

FAO/FIVIMS Framework: linkages between the overall development context, the food economy, households, and individual measures of well-being

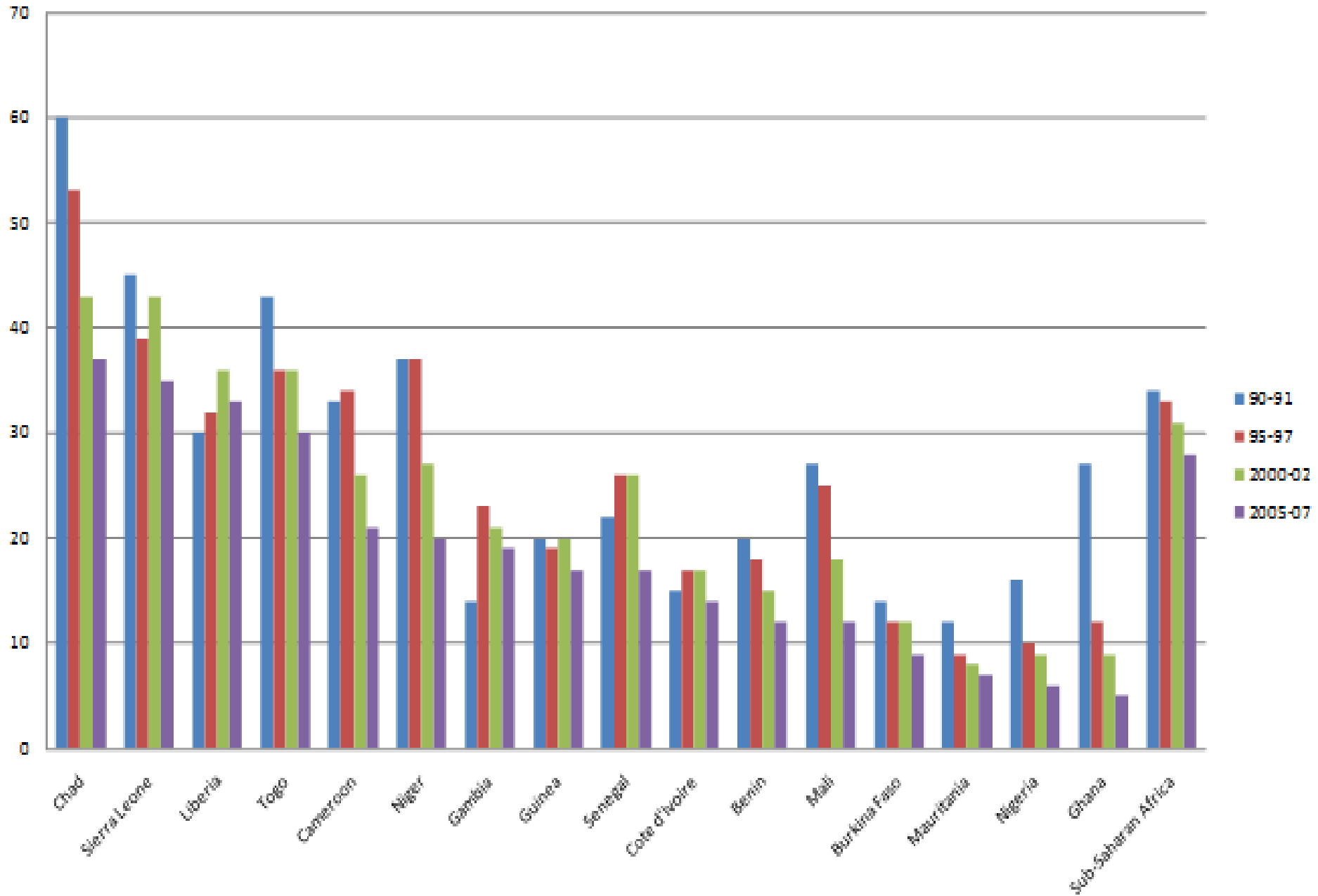


Prevalence of Undernourishment

Low and Falling	Medium and Stable/ High but Falling	High and Stable or Rising
Ghana, Nigeria, Mali, Mauritania, Benin, Burkina Faso	Senegal, Guinea, Côte d'Ivoire, Cape Verde, Niger, Cameroon, Gambia	Togo, Chad, Sierra Leone, Liberia, Guinea-Bissau

- **All regions of Africa have made progress, but West African undernourishment rates are lower than in Eastern, Central and Southern Africa.**
- **Undernourishment rates are generally lower in S.E. Asia (and more likely to remain so).**

Proportion of Undernourished in Total Population



Key Regional Factors, Trends

- Heterogeneity
- Tripling of Population, Expansion-based Production
- Persistent Low Agricultural Productivity
- Growing Regional Reliance on Cereal Imports

Threats to Gains in Food Security:

- Regional Demographics > 2050 World Leader
- Nigeria: a Tottering Agricultural “Giant”
- Weak Adaptive Capacity
- High Conflict Risk

Countries Requiring External Assistance - as reported by FAO/GIEWS since 1981 (As of June 2011)

	Total yrs in emergency	Max yrs of consec. emerge	Current emergency in years	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988
Eastern Africa																											
Ethiopia	31	31	31																								
Somalia	30	25	25																								
Sudan	28	28	28																								
Burundi	20	18	18																								
Uganda	20	15	15																								
Eritrea	19	19	19																								
Kenya	18	12	12																								
Tanzania	18	9																									
Rwanda	13	10																									
Djibouti	7	4																									
Comoros	3	3																									
Southern Africa																											
Angola	27	27																									
Mozambique	24	16																									
Lesotho	21	10	10																								
Malawi	15	6																									
Madagascar	14	8																									
Zimbabwe	14	11	11																								
Swaziland	13	6	6																								
Zambia	13	5																									
Botswana	7	7																									
Namibia	1	1																									
Western Africa																											
Sierra Leone	23	17	17																								
Liberia	22	22	22																								
Chad	19	8	8																								
Mauritania	17	8	8																								
Guinea	14	11	11																								
Niger	13	3	2																								
Côte d'Ivoire	10	10	10																								
Burkina Faso	9	2																									
Cape Verde	8	3																									
Guinea-Bissau	8	5	5																								
Mali	8	3																									
Ghana	6	3																									
Benin	5	2	2																								
Senegal	5	3																									
Gambia	4	2																									
Togo	2	2																									
Nigeria	0	0																									

Natural Disasters

Slow: Slowly developing disasters e.g. drought, adverse weather, trans-boundary diseases, avian influenza, pests, etc.

Sudden: Sudden on-set disasters such as floods, cyclones, hurricanes, earthquakes, volcanoes, locusts, etc.

Man-Made Disasters

War: War-conflict type disasters, such as war, civil strife, refugees, internally displaced persons, etc.

Socio-economic disasters: economic crises due to commodity price collapse, loss of export markets, currency problems, land tenure problems.

Combination of Natural and Man-Made Disasters

	'Peace Dividend'
Benin	200
Cape Verde	200
Togo	152
Ghana	105
Cameroon	72
Mauritania	63
Guinea	32
Burkina Faso	20
Gambia	20
Mali	19
Senegal	17
Niger	14
Nigeria	13
Guinea-Bissau	11
Sierra Leone	9
Cote D'Ivoire	9
Liberia	8
Chad	6

Estimated Impact of Various Levels of Conflict, Frequency and Duration

Derived from the
Uppsala Conflict Data
Programme and
UCDP/PRIO, Oslo

		Relative Status and Trends in Under-Nourishment and Key Associated Factors										
			% under-nourished 2005-2007	% Nutr. change 15 years	v.a. agric as % GDP	Ag productivity trend	Domestic cereal supply %	Vulnerability to natural disasters	Popl growth Trend 1960-2009	2009 Popl growth	% Population Urbanized	Rate of Urbanization
Prevalence of Under-Nourishment	Low and Falling	Ghana	5	0.81	32	regain	28	2.4	Peak -40	2.06	50	above average
		Nigeria	6	0.63	32	regain	75	0.1	Peak -20	2.3	48	above average
		Mali	12	0.56	33	rising	94	0.9	High, rising	2.36	32	average
		Mauritania	7	0.42	12	falling	25	7	Peak -40	2.32	41	above average
		Benin	12	0.4	32	rising	84	2.3	Peak -20	3.1	41	above average
		Burkina Faso	9	0.36	33	rising	95	1.5	High, rising	3.37	20	below average
		Popl-weight avg	6.3		30		81	0.6		2.2		
	Medium & Stable / Low & Falling	Senegal	17	0.23	14	falling	51	2.5	Peak -40	2.61	42	average
		Guinea	17	0.15	8	declining	89	0.1	Peak -20	2.36	34	average
		Cote d'Ivoire	14	0.07	24	declining	54	0.01	Peak -20	2.32	49	above average
		Cape Verde	14	0	8	regain	9	0.5	Peak -40	1.38	60	high
		Niger	20	0.46	40	regain	93	5.7	High, rising	3.9	17	below average
		Cameroon	21	0.36	19	declining	78	0.1	Peak -20	2.24	57	high
		Gambia	19	-0.36	25	falling	56	2.3	Peak -20	2.67	56	high
	Popl-weight avg	17.0		20		59	0.7		2.2			
	High & Stable/ Rising	Togo	30	0.3	43	declining	76	0.7	Peak -40	2.44	42	above average
		Chad	37	0.38	19	falling	90	1.9	High, rising	3.4	27	below average
		Sierra Leone	35	0.22	41	declining	69	0.1	High, rising	2.48	38	average
		Liberia	33	-0.1	54	falling	40	1.5	High, rising	4.17	60	high
Guinea-Bissau		31	-0.55	51	regain	82	0.6	Peak -20	2.21	30	below average	
Popl-weight avg		37.0		47		79	0.7		3.0			
Sources: FAO, World Bank ADI, CRED/OFDA, University of Uppsala UCDP, PRIO Oslo.												
Quality of policies: CPIA policies for social inclusion and equity - policies and institutions for environmental sustainability, 2008												
GDP per capita: 2008 in constant 2000 US\$												
Debt is the percentage of per capita annual income equivalent to the net present value of total public debt.												
Proportion of the population urbanized, WB ADI, 2008.												

		Relative Status and Trends in Under-Nourishment and Key Associated Factors								
		% under-nourished 2005-07	% Nutr. change 15 years	GDP per capita	Income trends	Debt 2007 (% per capita income)	Quality of policies	HDI 2007	ODA % GDP	"Peace Dividend" 1960-2010
Low and Falling	Ghana	5	0.81	302	regain	38	3.5	0.526	10.7	105
	Nigeria	6	0.63	454	rising	11	3	0.511	1.8	13
	Mali	12	0.56	290	rising	25	3	0.371	13.5	19
	Mauritania	7	0.42	483	stable	140	3.5	0.52	16.6	63
	Benin	12	0.4	348	rising	19	3.5	0.492	9.2	200
	Burkina Faso	9	0.36	258	rising	21	3.5	0.389	13.5	20
Popl-weight avg		6.3		409		17	2.9	0.5	4.5	30
Medium & Stable / High & Falling	Senegal	17	0.23	521	falling	32	3.5	0.464	8.9	17
	Guinea	17	0.15	396	rising	58	2.5	0.435	6.6	32
	Cote d'Ivoire	14	0.07	533	falling	107	2.5	0.484	2.6	9
	Cape Verde	14	0	1482	rising	50	3.5	0.708	15.5	200
	Niger	20	0.46	170	falling	18	3	0.34	13.8	14
	Cameroon	21	0.36	686	rising	7	3	0.523	5.4	72
Gambia	19	-0.36	351	stable	28	3.5	0.456	13.1	20	
Popl-weight avg		17.0		498		45	2.7	0.40	6	30
High & Stable/ Rising	Togo	30	0.3	250	stable	116	2.5	0.499	4.7	152
	Chad	37	0.38	266	regain	37	2	0.392	8.2	6
	Sierra Leone	35	0.22	246	falling	10	2	0.365	29.4	9
	Liberia	33	-0.1	138	falling	863	2	0.442	44.5	8
	Guinea-Bissau	31	-0.55	130	falling	415	2.5	0.396	32.1	11
Popl-weight avg		37.0		228		256	2.4	0.40	30	22
Sources: FAO, World Bank ADI, CRED/OFDA, University of Uppsala UCDP, PRIO Oslo.										
Quality of policies: CPIA policies for social inclusion and equity - policies and institutions for environmental sustainability, 2008										
GDP per capita: 2008 in constant 2000 US\$										
Debt is the percentage of per capita annual income equivalent to the net present value of total public debt.										
ODA: Net official development assistance from all donors as % of GDP, Average for 1999-2008.										

Trends in Under-Nourishment, GHI and in the Vulnerability Index

		% under-nourished 2005-2007	Under-nourishment Trend	Global Hunger Index, 2009	GHI Trend, 1990/2009	Structural Risk of Food Insecurity	Severity of Shocks	Coping Capacity	Vulnerability Index Values, 2008	Relative Index Ranking, 2008	
Prevalence of Under-Nourishment	Low and Falling	Ghana	5	Falling	11.5	Falling	Falling	Medium	Rising	0.336	6
		Nigeria	6	Falling	18.4	Falling	Stable	Medium	Rising	0.295	2
		Mali	12	Falling	19.5	Falling	Falling	Low	Rising	0.374	13
		Mauritania	7	Falling	15	Falling	Falling	Medium	Falling	0.346	8
		Benin	12	Falling	17.2	Falling	Falling	Medium	Rising	0.356	10
		Burkina Faso	9	Falling	20.4	Falling	Falling	Medium	Rising	0.368	12
		Popl-weight avg	6.3								
	Medium & Stable / Low & Falling	Senegal	17	Falling	17.3	Falling	Stable	Medium	Rising	0.333	5
		Guinea	17	Falling	18.2	Falling	Rising	Medium	Rising	0.361	11
		Cote d'Ivoire	14	Falling	14.5	Falling	Stable	Medium	Stable	0.314	4
		Cape Verde	14	Stable	n/a	n/a	Falling	Low	Rising	0.2	1
		Niger	20	Falling	28.8	Falling	Falling	Medium	Falling	0.411	16
		Cameroon	21	Falling	17.9	Falling	Stable	Medium	Rising	0.351	9
		Gambia	19	Rising	18.9	Rising	Rising	Medium	Rising	0.296	3
	Popl-weight avg	17.0									
	High & Stable / Rising	Togo	30	Falling	23.1	Falling	Rising	Medium	Stable	0.343	7
		Chad	37	Falling	31.3	Falling	Falling	High	Falling	0.494	18
		Sierra Leone	35	Falling	33.8	Rising	Rising	High	Stable	0.388	14
		Liberia	33	Rising	24.6	Rising	Rising	High	Rising	0.395	15
		Guinea-Bissau	31	Rising	23.1	Rising	Rising	Medium	Stable	0.443	17
Popl-weight avg		37.0									
Sources and notes: Under-nourishment, FAO											
Global Hunger Index, IFPRI, 2010											
Structural Risk of Food Insecurity: relative levels of economic diversification, market access, food import dependency											
Severity of Shocks: natural disasters, variations in food production, conflict severity index, price inflation											
Coping capacity: relative economic performance, capacity to mobilize resources, health and education indicators.											

Key Factors Associated with Food Security

“Straightforward” Factors:

- Productivity (resources, public/private investment, policies)
- Population and Social Conditions
- Crises

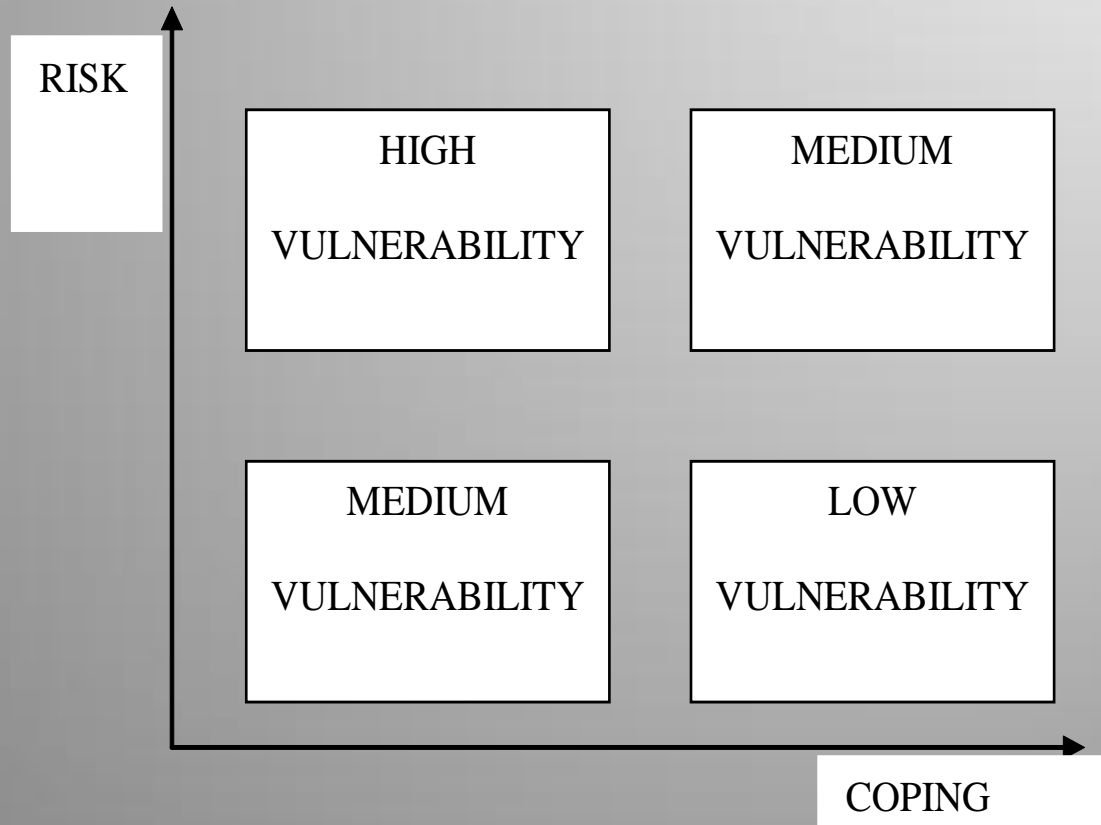
Complex Factors:

- Degree/rate of Urbanization
- Extent of Dependence on Cereal Imports

Vulnerability to Food Insecurity

Vulnerability = Risk / Coping Capacity

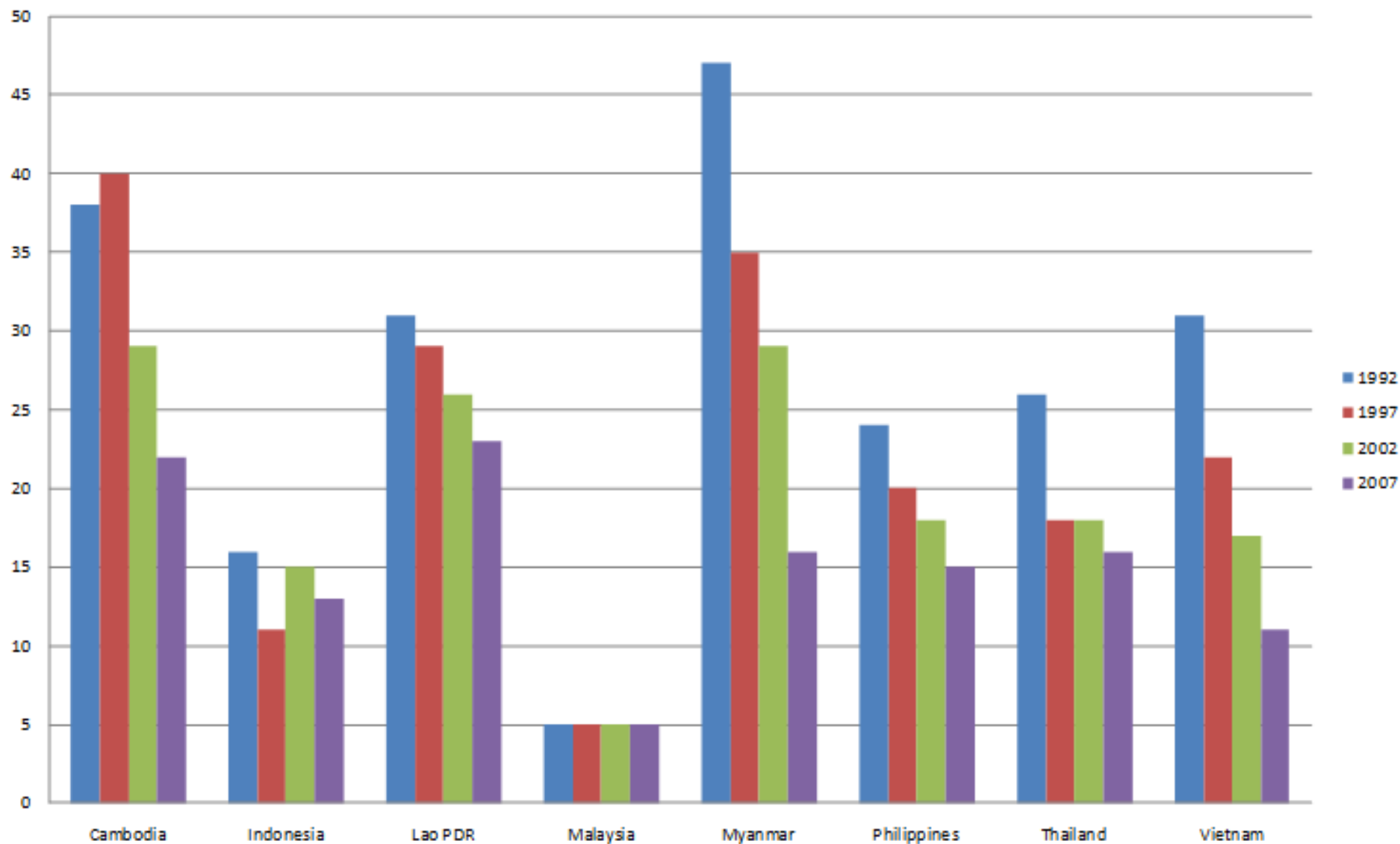
Risk = probability * incidence of a shock



Index of Vulnerability to food insecurity

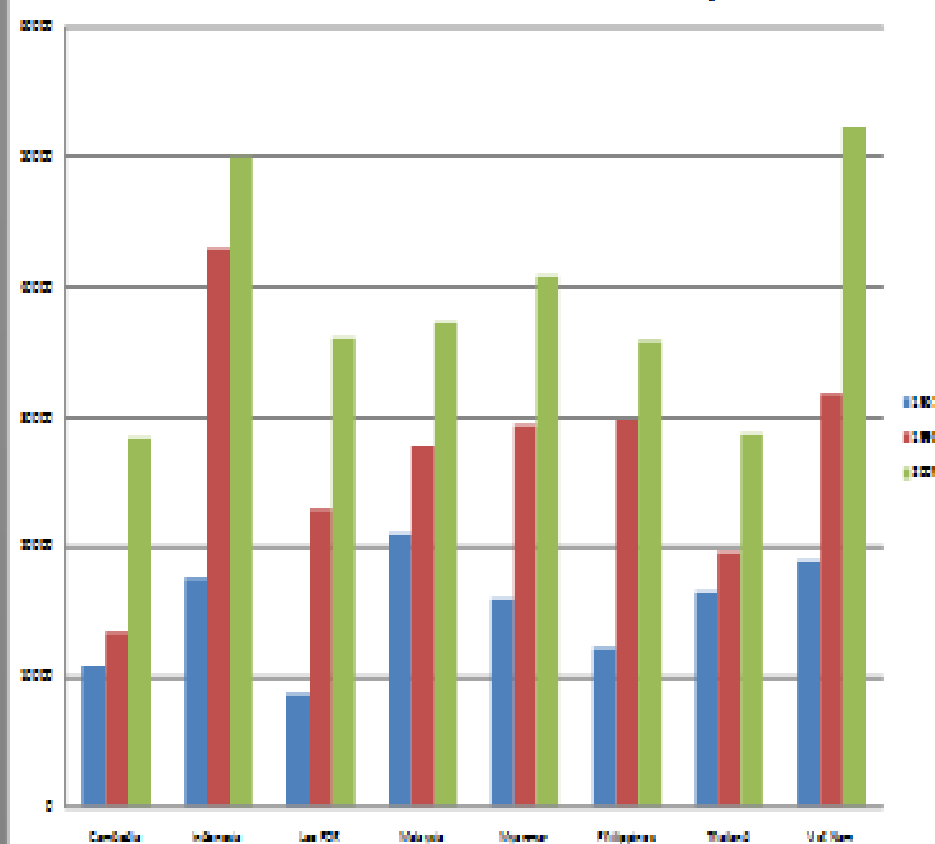
	Indicators	Variables
RISK	Exposure	
	Exposure to food insecurity (inherent)	
	a. Economic diversification	Share of VA from agriculture in total VA (%)
	b. Market access	Road density (km/100 km ² of land) Landlocked (dummy, 1 if landlocked)
	c. Import dependency	Cereal import dependency ratio (%)
	Shock (exogenous)	
a. Natural disaster severity index	Proportion of people affected by slow onset disasters (%) Number of people affected by slow disasters (1,000) Proportion of people affected by sudden disasters (%) Number of people affected by sudden disasters (1,000)	
Slow onset		
Sudden onset		
Cereal production growth index	Penalty for negative growth of per capita cereal production	
b. Man made disaster severity index	Proportion of IDPs and refugees (%) Number of IDPs and refugees (1,000)	
Conflict Severity Index		
Inflation	Change in consumer price index (%)	
COPING CAPACITY	Coping Capacity	
	Human coping capacity index (nurtured)	
	a. Health	Under five mortality rate
	b. Education	Adult literacy rate Secondary gross enrollment ratio
Economic coping capacity index (nurtured)		
a. Economic performance	GDP per capita (constant 2005 \$)	
b. Resource mobilization	Foreign reserves (current US\$) as % of GDP	

Proportion of People Undernourished, SE Asia Countries, Four Time Periods

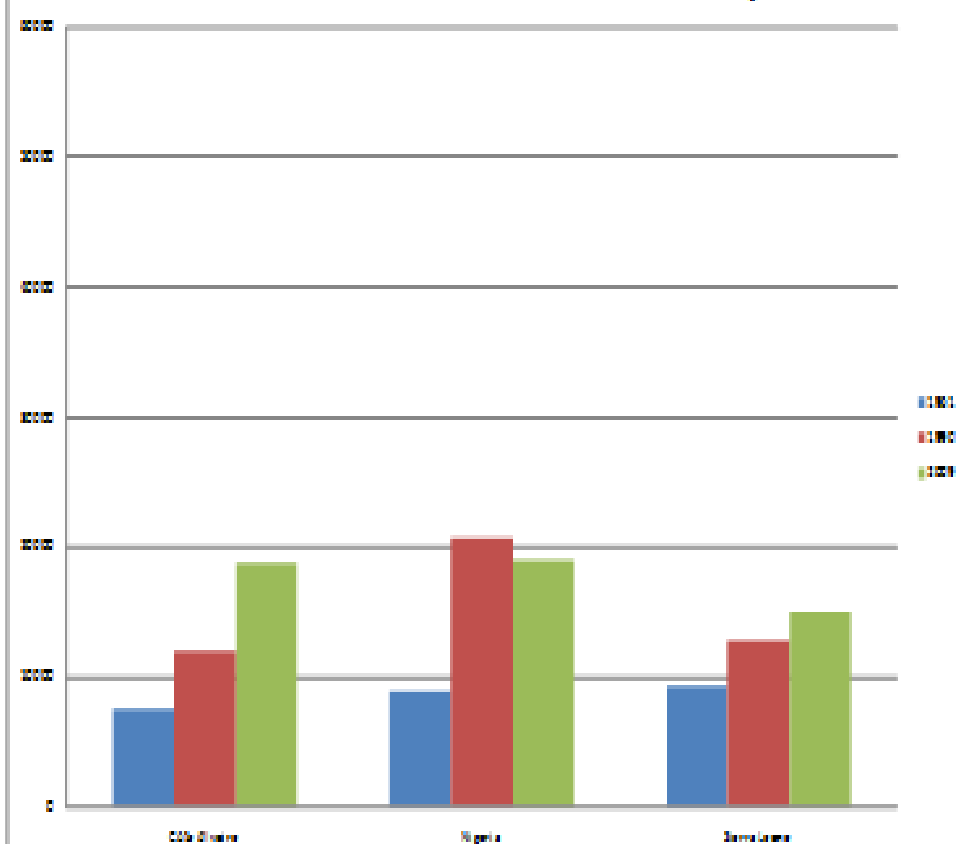


Evolution of Rice Yields, W. Africa, S.E. Asia

Rice Yields, Selected ASEAN Countries, 1961-2009, Hg/ha

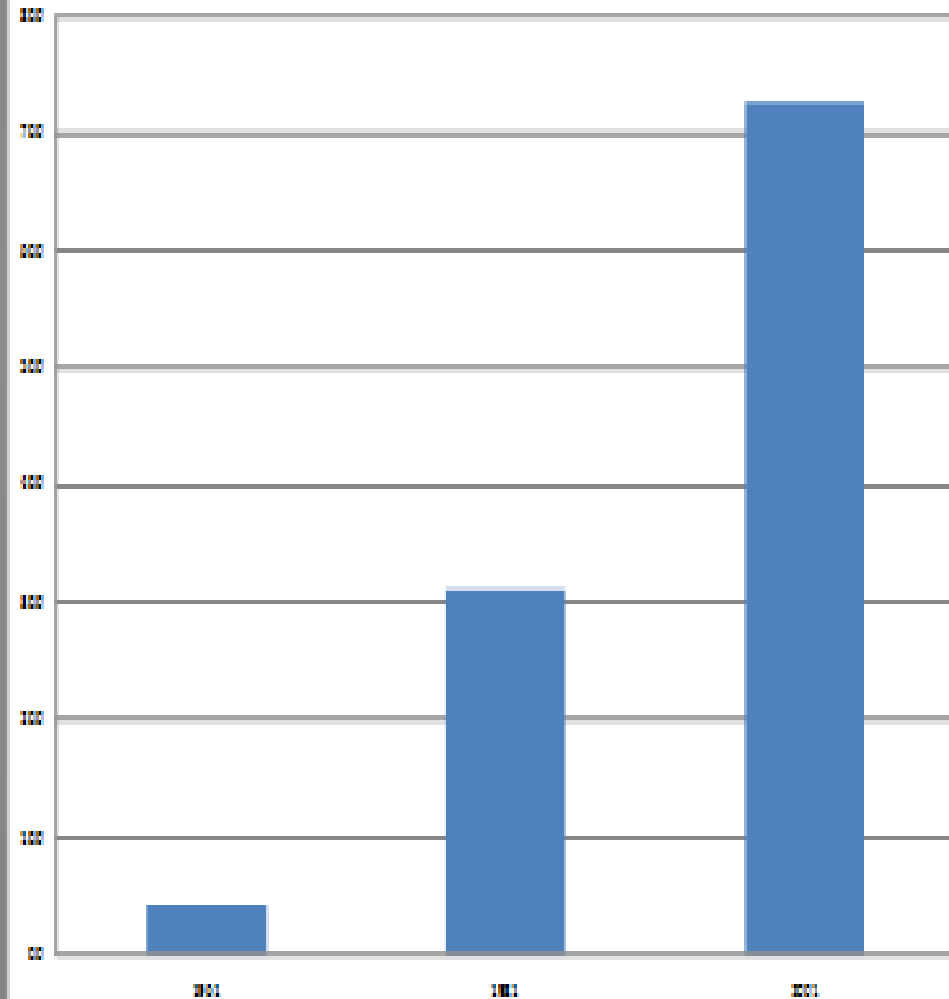


Rice Yields, Selected West African Countries, 1961-2009, Hg/ha

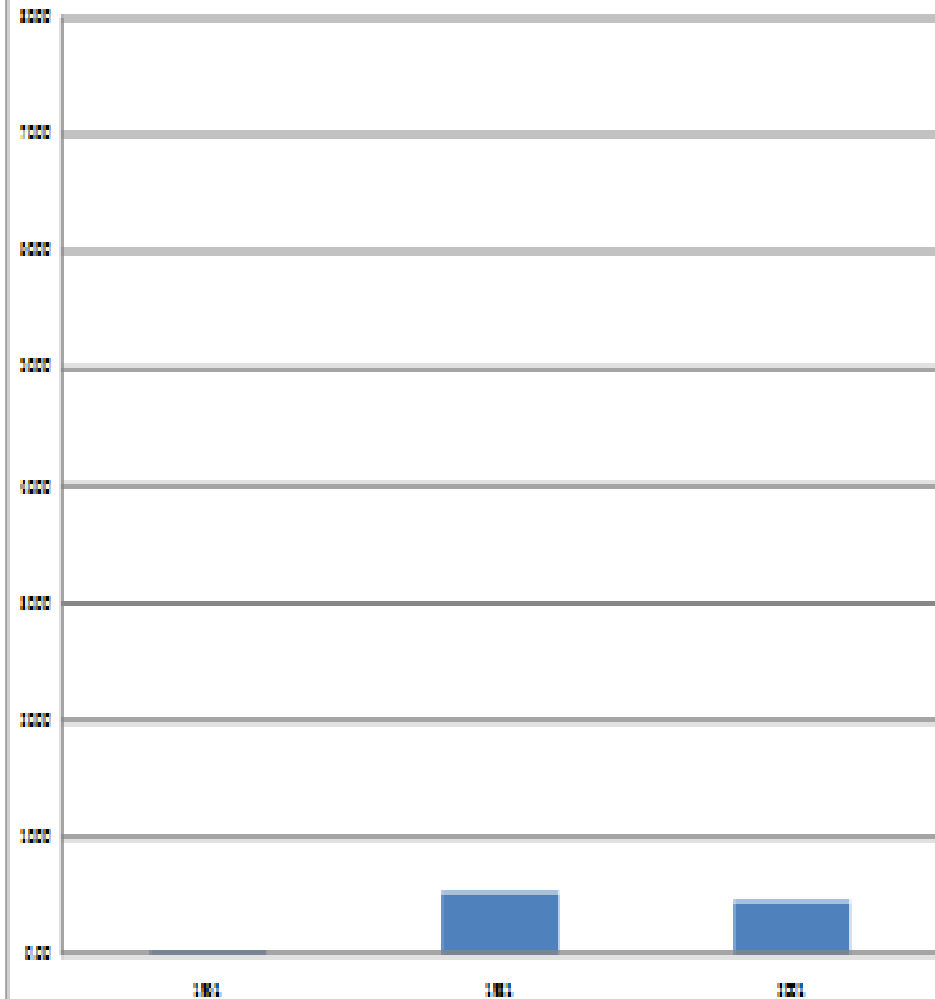


Fertilizer Applications – Two Regions

Fertilizer Application on Primary Crops, ASEAN Sample, 1961-2009 (kg/ha)



Fertilizer Application on Primary Crops, West Africa, 1961-2009 (kg/ha)

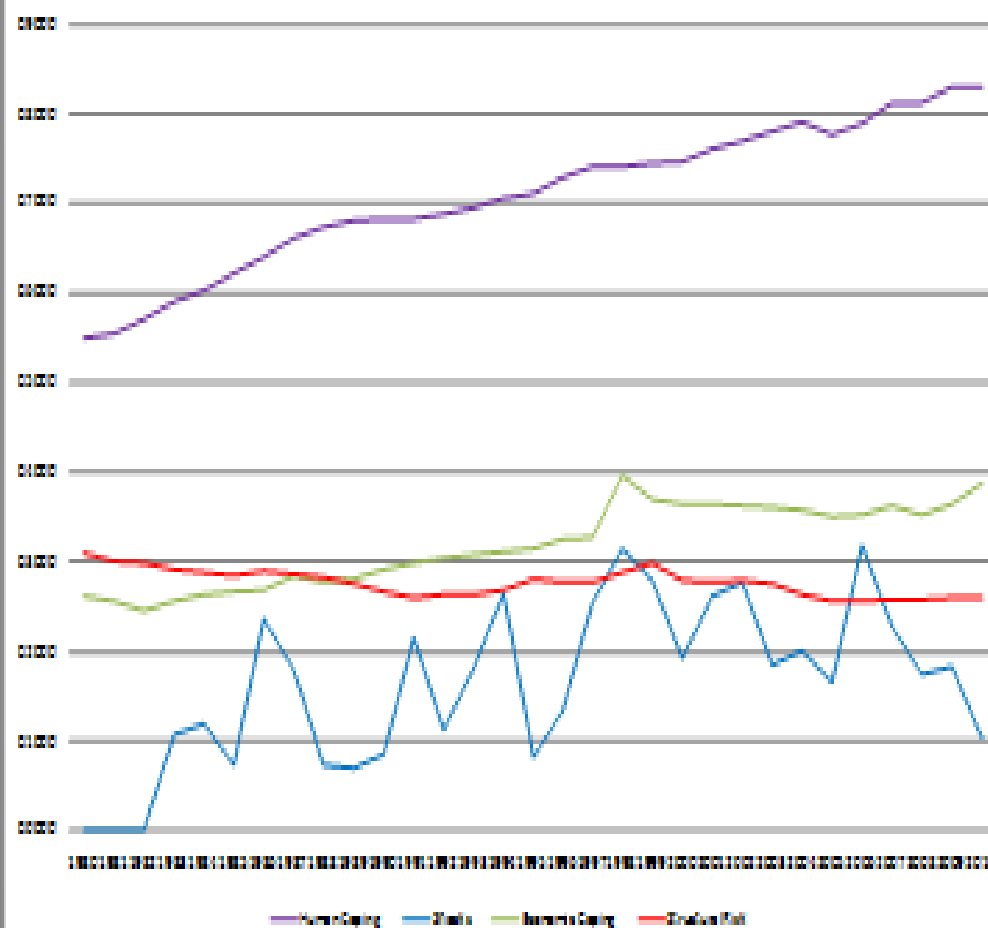


W. Africa / S.E. Asia - Key Differences

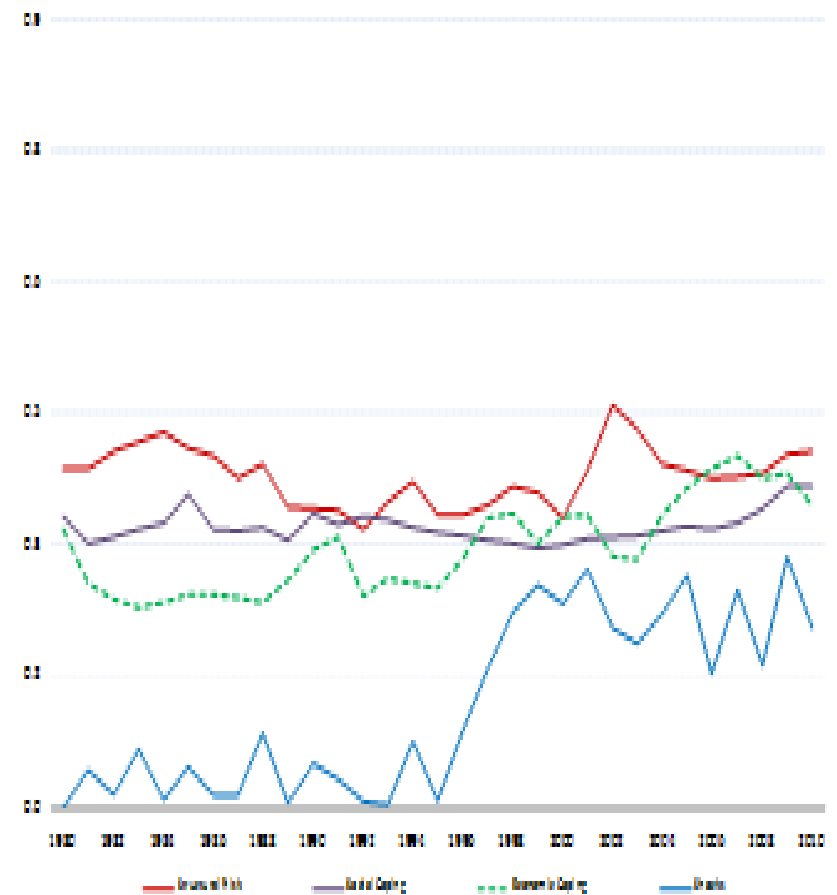
- Population Growth
- Resource Endowment
- Investment in Agriculture, Productivity
- Coping Capacity
- Density of Economic Activity

Vulnerability index over time

Indonesia Vulnerability to Food Insecurity

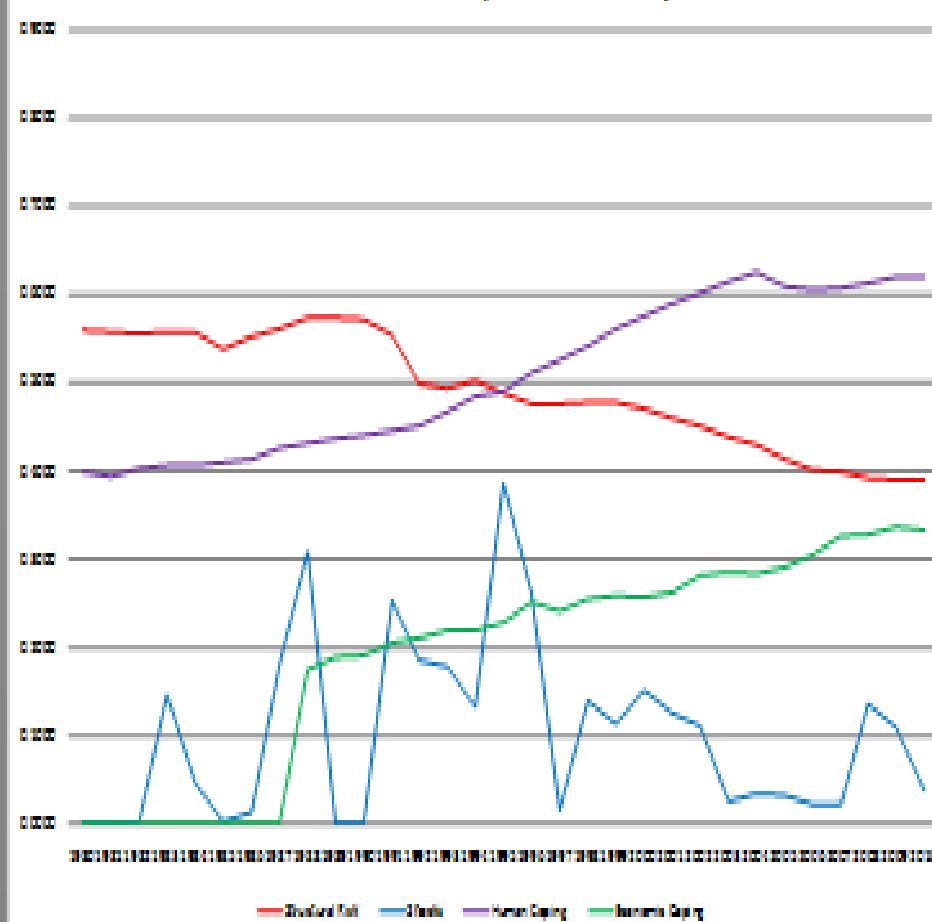


Nigeria

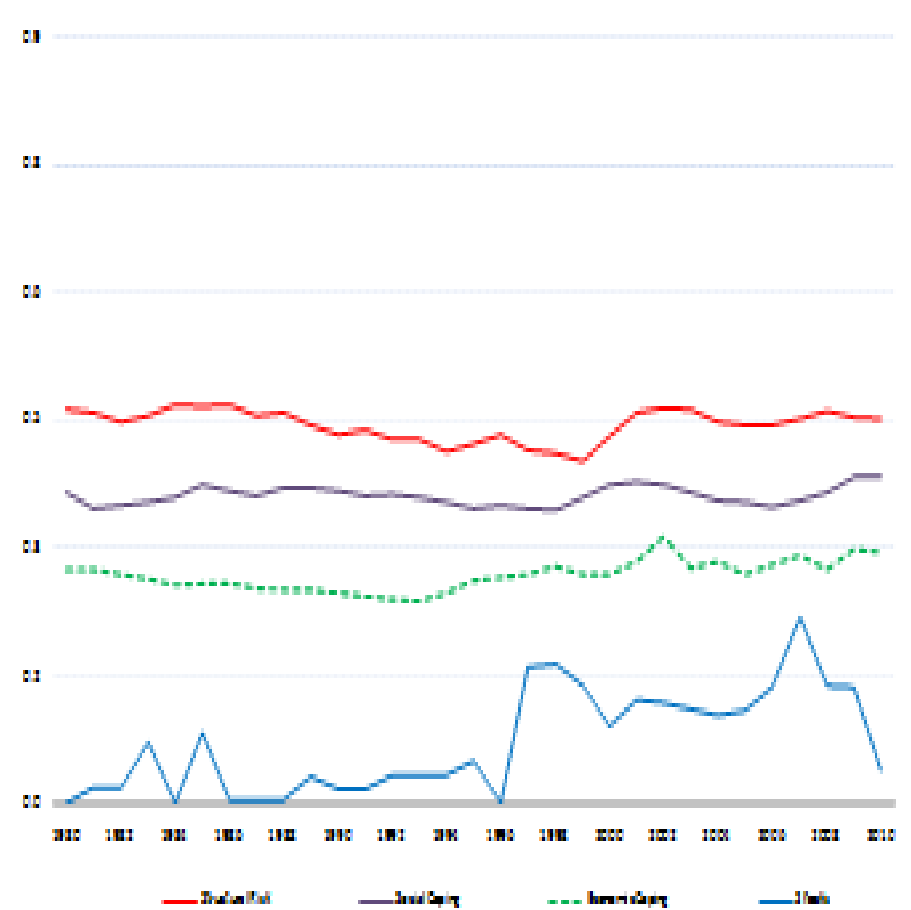


Vulnerability Index over time

Lao PDR Vulnerability to Food Insecurity



Cote d'Ivoire



Future Trends

Climate Change:

- New Patterns of Settlement, Redistributed Comparative Advantages

World Commodity Markets:

- Increased Price Volatility along a Rising Trend

Regional Dynamics:

- Essential to Successful Adaptation, Require
 - ✓ Security/Stability
 - ✓ Increased Investment
 - ✓ Improved Governance



West African Futures

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Thank You!