

Climate Change Impacts on Rural Poverty in Low-Elevation Coastal Zones

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Overview

- Review the main trends in LECZ populations worldwide, especially rural.
- Estimate the incidence of rural poverty in the LECZ, in specific regions and countries.
- Analyze the vulnerability of the rural poor to the direct impacts of coastal hazards, and the indirect impacts from climate change impacts on coastal ecosystems.
 - short-lived natural disasters with immediate and often extreme impacts, such as flooding and storm surge
 - long-term climatic changes with more gradual impacts, such as sea-level rise, saline intrusion and erosion
- Discuss the policy implications for improving the protection and adaptation of poor rural LECZ populations

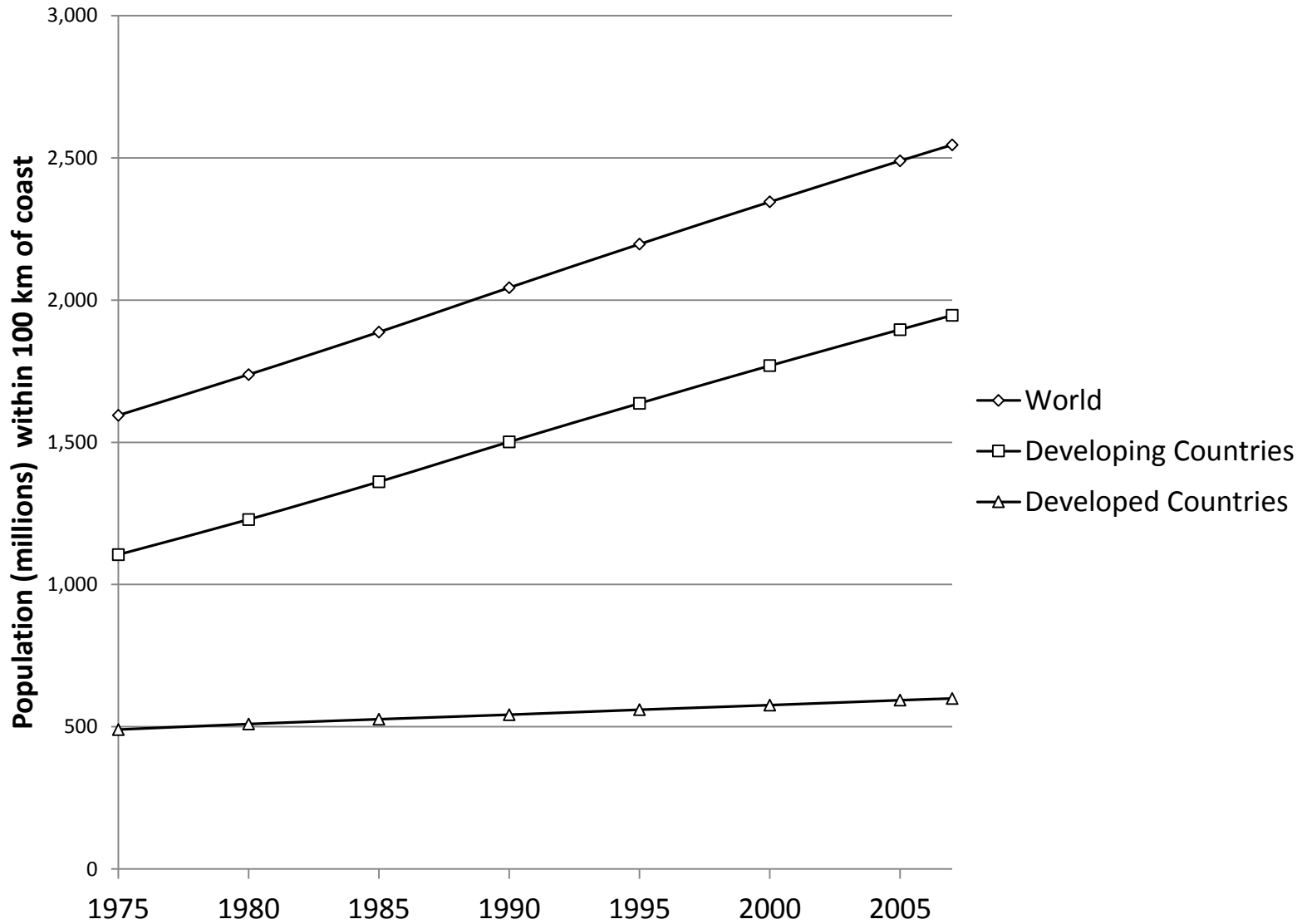
Key Findings

- Just 15 developing countries contain around 90% of the world's LECZ rural poor.
- Bangladesh and India alone have at least half of the rural LECZ population with high infant mortality, and along with Vietnam, around 70% of the rural LECZ population with malnourished children.
- Low-income countries as a group have the highest incidence of poverty, which declines somewhat for lower middle-income countries, and then is much lower for upper middle-income economies.

Policy Implications

- Although fostering growth, especially in coastal areas, may reduce rural poverty in the LECZ, additional policy actions will be required:
 - Protect vulnerable communities from disasters
 - Conserve and restore key coastal and near-shore ecosystems
 - Promote key infrastructure investments and coastal community response capability.
- The 15 countries should be the priority, although all developing countries with significant shares of their rural poor in LECZ should be included.

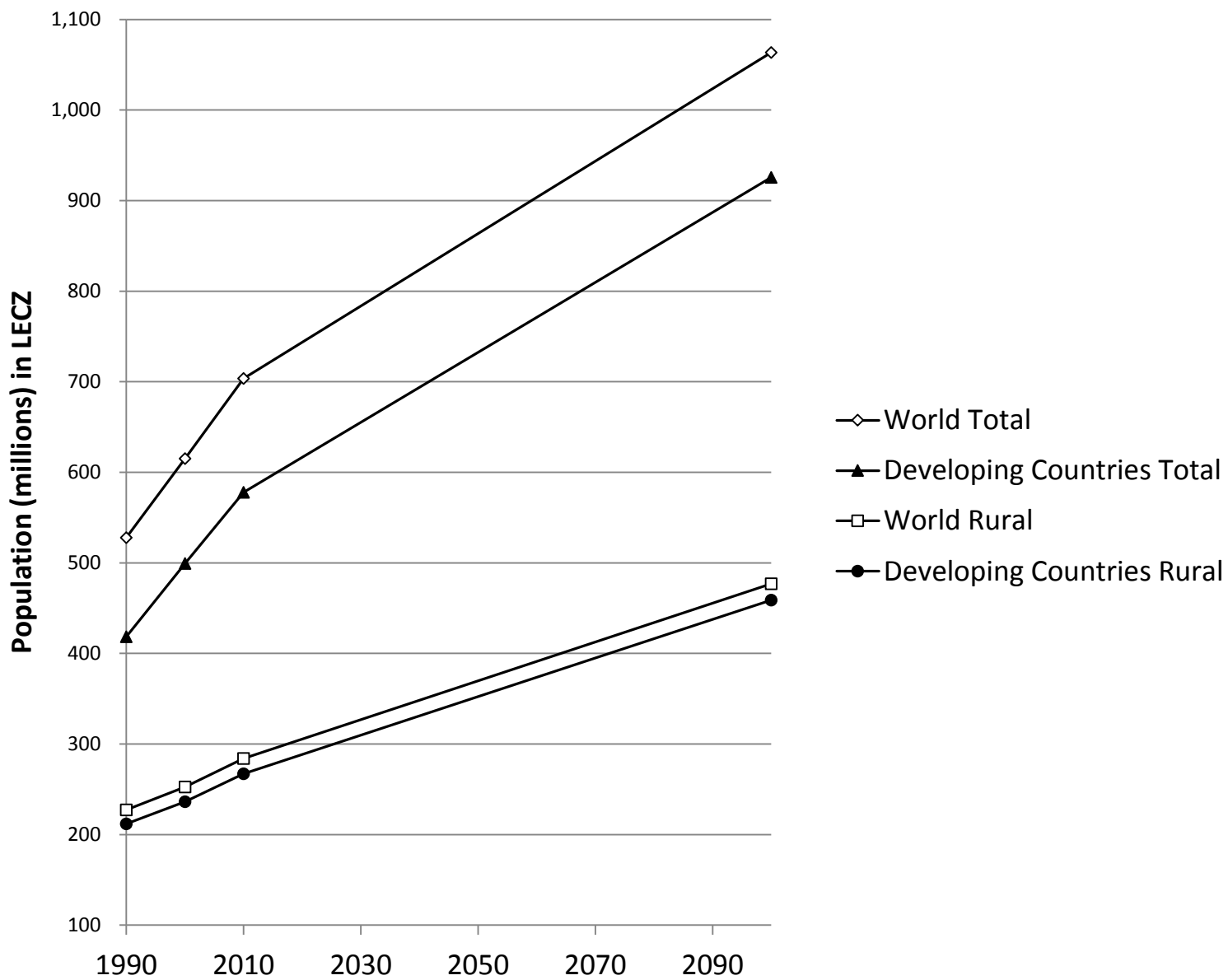
Population within 100 kilometers of coast, 1975-2007



Low Elevation Zone Coastal Share of Coastal Population, 2000

	LECZ Share (%) of Total Coastal Population	LECZ Share (%) of Urban Coastal Population	LECZ Share (%) of Rural Coastal Population
Developing Country	30.9%	33.4%	28.5%
By Income:			
Low Income	46.5%	43.0%	48.1%
Lower Middle Income	26.0%	30.3%	23.2%
Upper Middle Income	32.8%	34.6%	29.5%
By Region:			
East Asia & Pacific	40.2%	48.5%	33.0%
Europe & Central Asia	7.5%	8.6%	5.8%
Latin America & Caribbean	12.1%	13.7%	9.1%
Middle East & North Africa	26.9%	25.5%	28.4%
South Asia	35.0%	34.6%	35.2%
Sub-Saharan Africa	18.4%	24.4%	12.6%
Developed Country	18.7%	19.8%	13.9%
World	27.5%	28.1%	26.7%

Population in Low Elevation Coastal Zones, 1990-2100



Poverty among Low Elevation Coastal Zone Populations, 2000

		Population with High Infant Mortality (millions)		Rural Share (%)	Population with Malnourished Children (millions)		Rural Share (%)	Share (%) of Rural LECZ Population with High Infant Mortality	Share (%) of Rural LECZ Population with Malnourished Children
		Total	Rural		Total	Rural			
Developing Country		119.3	64.3	53.9%	106.8	62.4	58.4%	27.2%	26.4%
By Income:									
Low Income		50.8	34.3	67.5%	33.5	25.0	74.6%	59.2%	43.1%
Lower Middle Income		61.0	26.8	43.9%	63.7	34.2	53.6%	23.8%	30.3%
Upper Middle Income		7.6	3.3	43.2%	9.6	3.2	33.6%	5.0%	4.9%
By Region:									
East Asia & Pacific		18.4	12.9	70.3%	41.0	24.0	58.5%	10.5%	19.5%
Europe & Central Asia		0.0	0.0	--	0.2	0.1	36.2%	0.0%	6.0%
Latin America & Caribbean		2.9	1.2	41.3%	1.9	0.6	31.0%	16.1%	7.9%
Middle East & North Africa		4.0	1.9	47.4%	1.7	0.8	49.8%	11.4%	4.9%
South Asia		71.1	40.3	56.6%	56.8	34.9	61.4%	50.8%	44.1%
Sub-Saharan Africa		22.9	8.0	35.1%	5.2	2.0	38.1%	98.4%	24.1%
Developed Country		0.02	0.02	86.1%	0.7	0.1	14.5%	0.2%	0.6%
World		119.4	64.4	53.9%	107.5	62.5	58.1%	25.5%	24.7%

Countries with High Rural Low Elevation Coastal Zone Poverty, 2000

		High Infant Mortality			Malnourished Children				
Rank	Country	Rural LECZ Population ('000)	Share (%) of Rural LECZ Population	LECZ Share (%) of Rural Population	Rank	Country	Rural LECZ Population ('000)	Share (%) of Rural LECZ Population	LECZ Share (%) of Rural Population
1	India	19,419.9	55.4%	3.3%	1	Bangladesh	19,092.3	46.4%	33.2%
2	Bangladesh	19,143.5	46.5%	27.1%	2	India	14,635.0	41.7%	4.3%
3	Myanmar	7,791.0	99.7%	21.1%	3	Vietnam	10,764.0	33.0%	53.7%
4	Cambodia	3,306.5	99.5%	30.6%	4	Indonesia	4,466.6	26.3%	12.8%
5	Nigeria	2,175.1	100.0%	2.7%	5	Myanmar	3,001.2	38.4%	22.9%
6	Pakistan	1,694.1	99.5%	1.8%	6	Philippines	1,564.4	27.9%	10.5%
7	Iraq	1,324.3	99.3%	11.9%	7	Cambodia	1,384.5	41.7%	27.8%
8	Mozambique	1,041.2	100.0%	7.8%	8	China	1,117.5	2.3%	5.1%
9	Senegal	802.9	100.0%	14.0%	9	Thailand	955.0	18.6%	11.8%
10	Brazil	759.6	38.6%	4.0%	10	Pakistan	842.9	49.5%	2.3%
	Total	57,458.1	83.9%	12.4%		Total	57,823.4	32.6%	19.0%

Exposure of the LECZ in Developing Countries to Sea-Level Rise and Storm Surge Intensification

		% of Coastal GDP (2005) Exposed		% of Coastal Agricultural Area Exposed		% of Coastal Wetlands Area Impacted	
		Current Storm Surge	Intensified Storm Surge	Current Storm Surge	Intensified Storm Surge	Current Storm Surge	Intensified Storm Surge
Developing Country		7.0%	12.5%	4.3%	8.9%	10.1%	17.1%
East Asia & Pacific		5.9%	11.1%	4.6%	9.0%	11.3%	18.1%
Latin America & Caribbean		5.5%	9.9%	1.7%	4.1%	5.5%	9.9%
Middle East & North Africa		15.1%	23.8%	1.0%	4.1%	18.9%	29.3%
South Asia		7.9%	14.4%	4.2%	10.7%	12.2%	22.0%
Sub-Saharan Africa		3.9%	8.6%	1.3%	3.5%	7.6%	14.6%

Adapted from Dasgupta, S. Laplante, B., Murray, S. and Wheeler, D. 2011. "Exposure of developing countries to sea-level rise and storm surges." *Climatic Change* 106:567-579, Tables 2 and 3.

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East Asia & Pacific		5.9%	11.1%	4.6%	9.0%	11.3%	18.1%
Latin America & Caribbean		5.5%	9.9%	1.7%	4.1%	5.5%	9.9%
Middle East & North Africa		15.1%	23.8%	1.0%	4.1%	18.9%	29.3%
South Asia		7.9%	14.4%	4.2%	10.7%	12.2%	22.0%
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East Asia & Pacific		5.9%	11.1%	4.6%	9.0%	11.3%	18.1%
Latin America & Caribbean		5.5%	9.9%	1.7%	4.1%	5.5%	9.9%
Middle East & North Africa		15.1%	23.8%	1.0%	4.1%	18.9%	29.3%
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Climate Change Vulnerability of Countries with the Largest Poor Rural LECZ Populations

Country	Rural LECZ Population with High Infant Mortality ('000)	Rural LECZ Population with Malnourished Children ('000)	% of Coastal GDP Exposed	% of Coastal Agricultural Area Exposed	% of Coastal Wetlands Area Impacted	Growth (%) of Rural LECZ Population 2000-2010
India	19,419.9	14,635.0	27.7%	23.6%	32.3%	20.5%
Bangladesh	19,143.5	19,092.3	19.0%	17.5%	24.3%	15.7%
Myanmar	7,791.0	3,001.2	48.9%	22.9%	50.2%	0.2%
Cambodia	3,306.5	1,384.5	2.7%	1.0%	1.5%	12.0%
Nigeria	2,175.1	450.5	22.0%	100.0%	38.8%	35.8%
Pakistan	1,694.1	842.9	38.6%	2.7%	61.4%	22.9%
Iraq	1,324.3	211.2	31.1%
Mozambique	1,041.2	265.7	55.0%	23.6%	47.1%	33.0%
Senegal	802.9	194.7	21.1%	2.0%	22.0%	22.6%
Brazil	759.6	127.4	28.5%	16.5%	11.5%	10.1%
China	624.7	1,117.5	17.1%	11.7%	39.8%	1.7%
Indonesia	416.0	4,466.6	38.7%	26.1%	27.0%	13.4%
Philippines	359.6	1,564.4	52.3%	30.7%	45.0%	25.0%
Vietnam	314.5	10,764.0	31.7%	23.8%	29.4%	11.3%
Thailand	9.4	955.0	31.6%	11.6%	14.7%	12.4%
Total	59,182.3	59,072.9	31.1%	22.4%	31.8%	17.5%

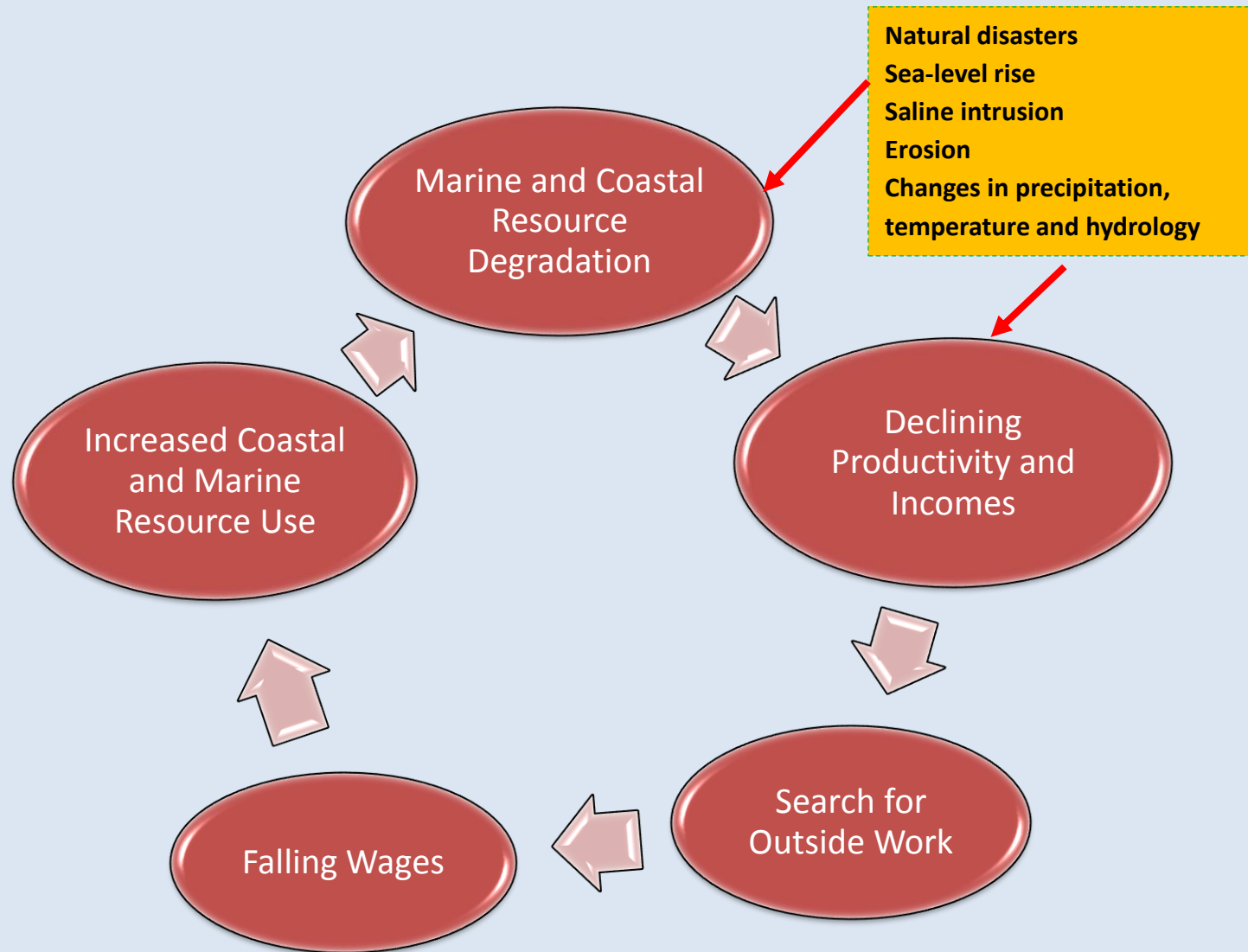
Mangrove Extent and Threats in Countries with the Largest Poor Rural LECZ Populations

Country	2012 Mangrove Forest Area (km ²)	Mangrove Loss (%) 2000-2012	% of Coastal Wetlands Area Impacted	Growth (%) of Rural LECZ Population 2000-2010	Annual GDP per capita Growth (%) 2000-2012
India	797.8	3.3%	32.3%	20.5%	7.9%
Bangladesh	1,773.0	0.1%	24.3%	15.7%	5.9%
Myanmar	2,557.4	8.4%	50.2%	0.2%	..
Cambodia	323.2	4.5%	1.5%	12.0%	8.7%
Nigeria	2,654.0	0.1%	38.8%	35.8%	7.2%
Pakistan	11.7	0.3%	61.4%	22.9%	2.5%
Iraq	31.1%	1.7%
Mozambique	1,223.7	0.2%	47.1%	33.0%	6.4%
Senegal	155.3	0.0%	22.0%	22.6%	1.1%
Brazil	7,674.9	0.6%	11.5%	10.1%	2.5%
China	33.8	1.9%	39.8%	1.7%	16.5%
Indonesia	23,324.3	3.1%	27.0%	13.4%	5.0%
Philippines	2,064.2	1.3%	45.0%	25.0%	3.5%
Vietnam	708.2	1.1%	29.4%	11.3%	7.1%
Thailand	1,886.3	2.4%	14.7%	12.4%	4.5%
Total	45,187.9	2.0%	31.8%	17.5%	5.7%

Diversified livelihood strategy

- Land is one of the few productive assets owned by the rural poor.
- Almost all households engage in agriculture, but very small landholdings.
- Agriculture is generally not the mainstay of most these households.
- Most of their income from off-farm work.
- Migrate only temporarily and for short distances.
- High dependence on exploiting marine and coastal resources – collection of products from local forests, such as mangroves, and small-scale fishing.

The Poverty-Environment Trap and Climate Change in Coastal Areas



Policy Strategy

- Fostering economic growth, especially in coastal areas, is necessary but not sufficient.
- More location-specific targeting of rural poor in LECZ.
 - Strengthening community groups responsible for managing coastal resources, improvements in coastal infrastructure, and policies and investments to encourage the most vulnerable migrate to non-coastal areas.
 - Livelihood diversification out of fishing, agriculture and other coastal resource-based activities, investments in health and education, and broader investments in local governance and institutions.
- Protecting coastal populations, especially the rural poor
 - protecting coastlines and populations from risks posed by damaging storms
 - restoring valuable coastal systems