

Landscape Heterogeneity and the Power of Agricultural Growth as an Engine for Poverty Reduction

Arsenio M. Balisacan

University of the Philippines Diliman

Email: arsenio.balisacan@up.edu.ph

**Sustainability Science for Food, Forests, and Floods: Integrating
Climate Adaptation and Pro-Poor Resource Management**

Hawai'i Imin International Conference Center, Honolulu

27-28 May 2010

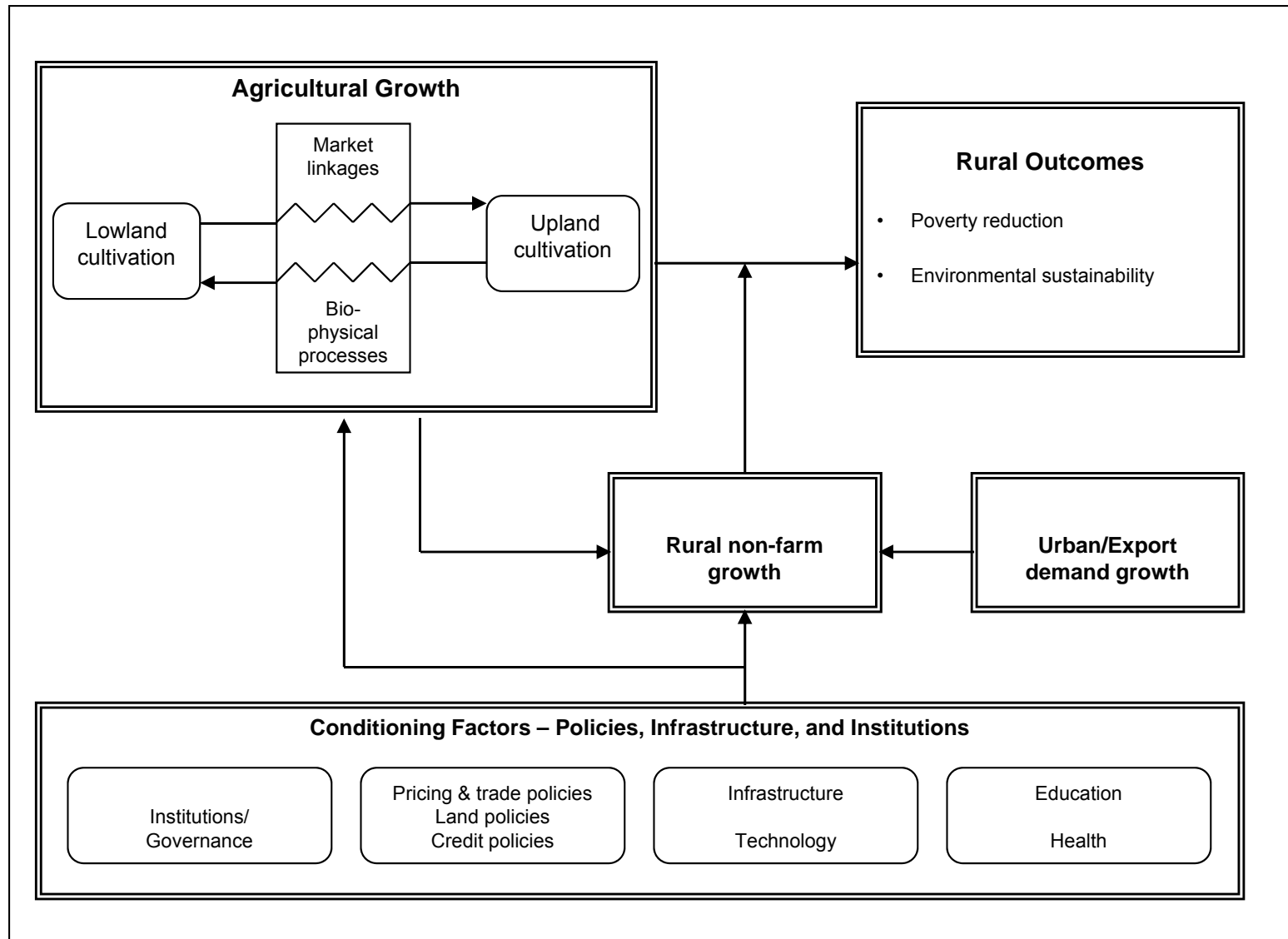
Context

- ✦ **Poverty in the developing world remains a rural phenomenon**
- ✦ **Search for drivers of rural poverty reduction, especially in view of new challenges (climate change, water scarcity, global supply chains)**
- ✦ **Recent past: agricultural growth driven by technological change – key driver of rural poverty reduction**
- ✦ **Increasingly crucial role of non-agricultural income growth in rural poverty reduction**

Landscape heterogeneity in poverty reduction

- ✦ **Agri growth vs non-agri growth in poverty reduction: a misleading dichotomy**
- ✦ **Diversity in geography & initial conditions (landscape heterogeneity)**
- ✦ **Co-existence of agri growth and non-agri growth as efficient pathways out of poverty**

Conditioning factors, agricultural growth, and rural welfare outcomes



Stylized observations on poverty reduction in Philippine provinces (1)

- For the large majority of provinces, poverty has been accompanied by higher growth rates in non-ag. income than in ag. Income.

FIES 1991-2006

(# of provinces)	$\Delta \text{ag income} > \Delta \text{non-ag income}$	$\Delta \text{ag income} < \Delta \text{non-ag income}$
Poverty reduction	4*	58
Poverty increase	3	8

Stylized observations on poverty reduction in Philippine provinces (2)

- Reduction in the rural poor (and non-poor) dependent of agriculture
- Substantial increases in the non-poor (both rural and urban) who are dependent on non-agricultural incomes

FIES 1991-2003

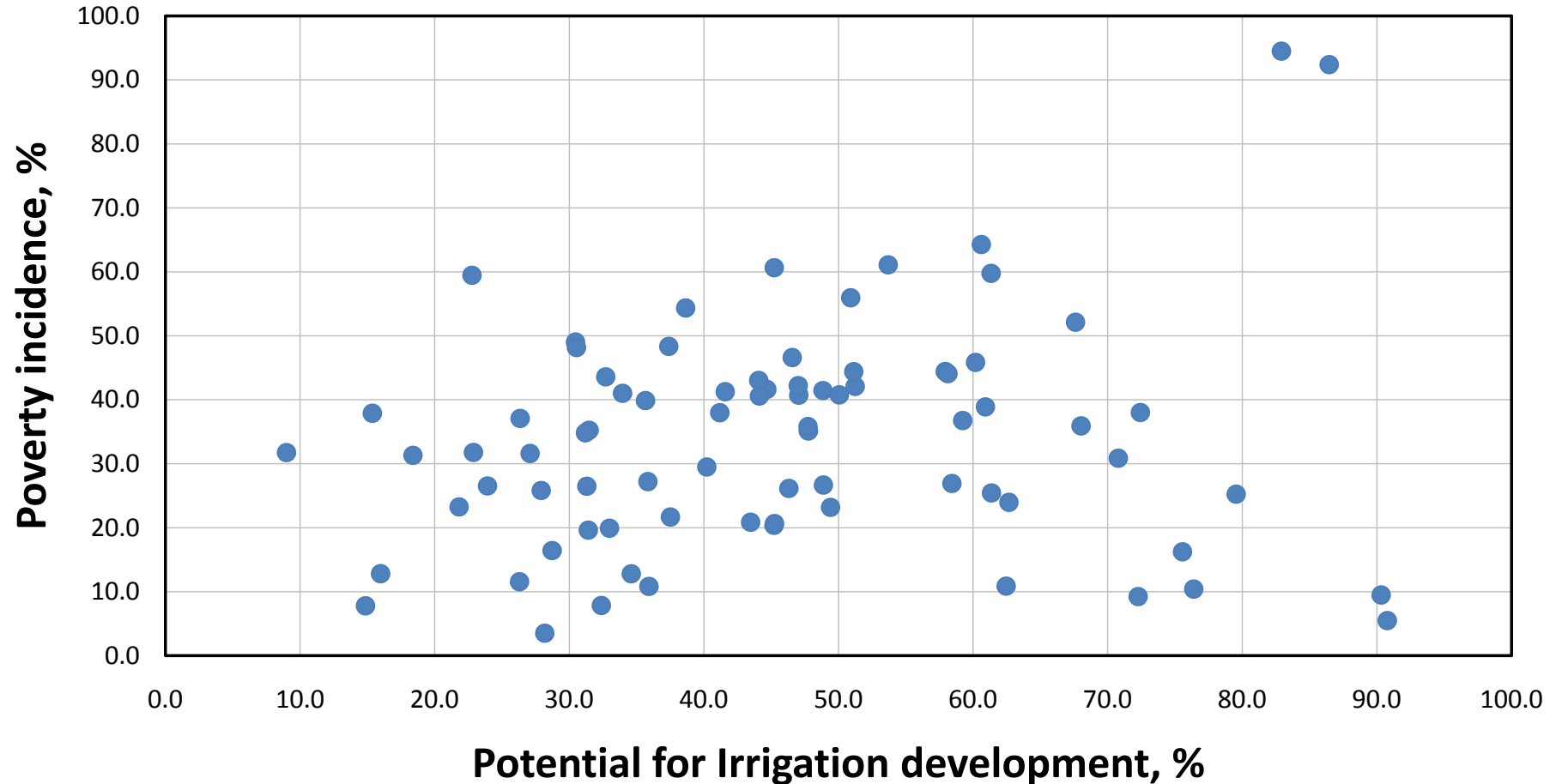
		Rural		Urban	
		non-ag. income < ag. income	non-ag. income > ag. income	non-ag. income < ag. income	non-ag. income > ag. income
poverty status	non-poor	-8.96	+19.61	-5.96	+14.35
	poor	-11.69	+1.04	-5.27	-3.12

- ⊕ For the large majority of provinces, non-ag. income growth has been the main engine for poverty reduction.
- ⊕ But relative response of poverty to sectoral growth varies significantly across provinces.

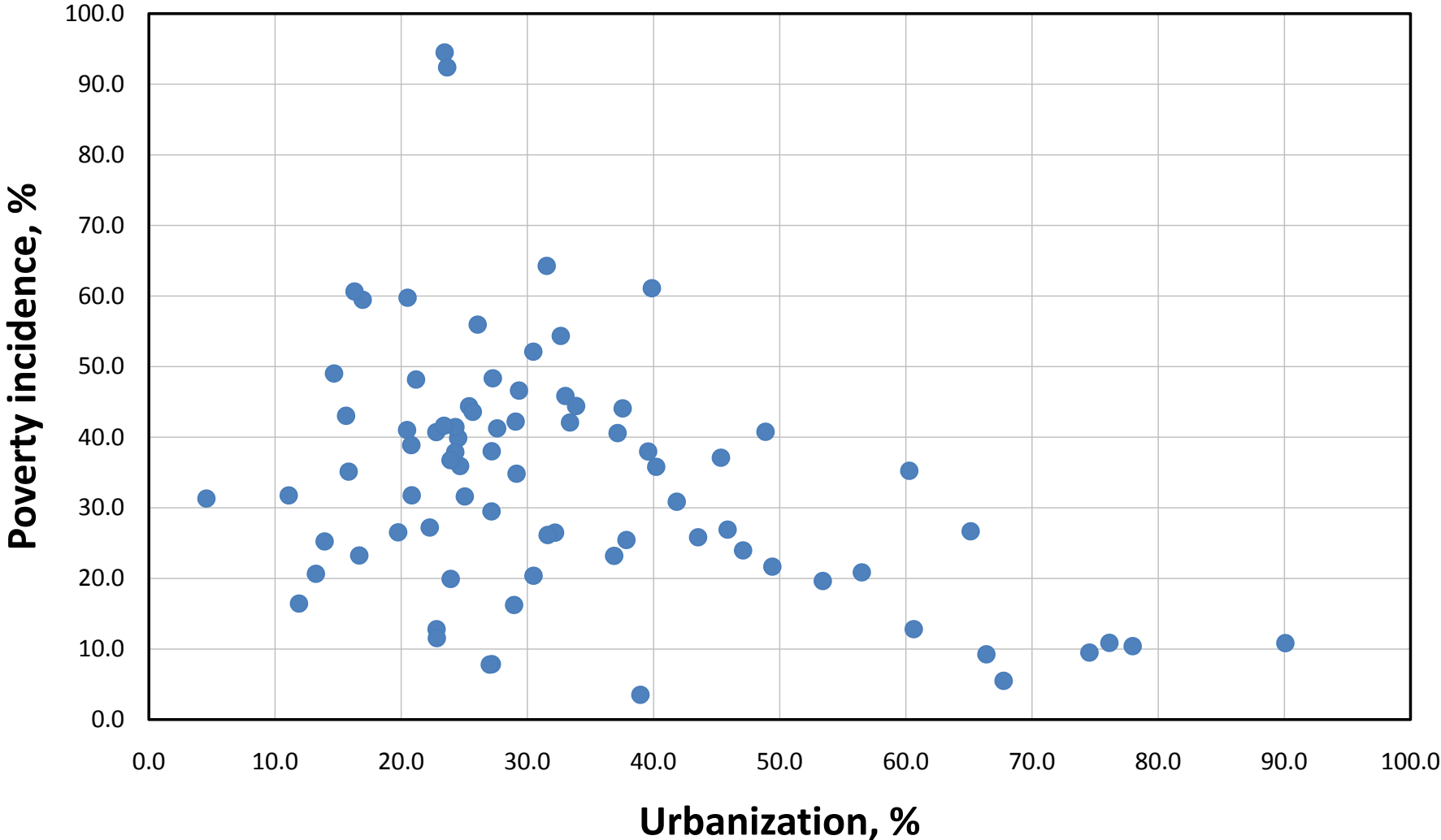
Philippine provinces by “landscape”

		Level of commercialization (Urbanization)					
		Low (highly rural)		Mid (Peri-urban)		High (urban)	
Geo-physical endowments (Irrigation potential)	Low	Abra	Antique				
		Catanduanes	Ifugao	Aurora		Benguet	
		Kalinga Apayao	Mt.Province	Bananos			
	Nueva Vizcaya	Quirino	Mindoro Occidental				
	Romblon	Southern Leyte					
	Mid	Agusan del sur	Aklan				
		Albay	Bohol				
		Cagayan	Davao del sur	Bukidnon	Camiguin		
		Ilocos Norte	Ilocos Sur	Capiz	Davao		
		Isabela	La Union	Davao Oriental	Eastern Samar	Cebu	
		Lanao del Norte	Marinduque	Iloilo	Lanao del Sur	Misamis Oriental	
		Mindoro Oriental	Misamis Occ.	Leyte	Negros Occidental	Rizal	
		Negros oriental	Northern Samar	Palawan	Quezon		
		Samar (western)	Siquijor	South Cotabato	Surigao del Norte		
		Sorsogon	Sultan Kudarat	Zambales	Zamboanga del sur		
		Zamboanga del norte					
	High	Camarines Norte	Cotabato				
		Masbate	Nueva Ecija	Agusan del Norte	Basilan	Bataan	Bulacan
		Sulu	Tarlac	Batangas	Camarines Sur	Cavite	Laguna
		Tawi-Tawi		Maguindanao	Pangasinan	Pampanga	

Geophysical endowment & poverty in Philippine provinces



Access-to-markets & poverty in Philippine provinces



What policy levers can sharpen the response of poverty reduction to sectoral growth?

Initial conditions affecting the sectoral growth elasticity of poverty reduction
(Provincial panel data, 1991-2006; fixed effects model)
Dependent variable = $\ln(\text{Provincial poverty}_{it})$

Variable	Coeff	Std Err
Ln(non-ag Y per capita)	-1.670***	0.358
Ln(agri Y per hectare)	-0.230***	0.083
Time trend (year)	-0.010***	0.003
<i>Ln (non-ag income) interacted w/ initial conditions of 1991</i>		
OFW share	-0.501***	0.116
Malnutrition	6.309***	2.122
Road density	-0.372***	0.134
Income inequality	1.877**	0.846
<i>Ln (ag income) interacted w/ initial conditions of 1991</i>		
Irrigation potential	-0.674**	0.312
Rice yield	-0.289**	0.075
_constant	27.745***	6.324
Number of obs.	402	
R-squared	0.550	
F-test (all coefficients zero)	39.116	

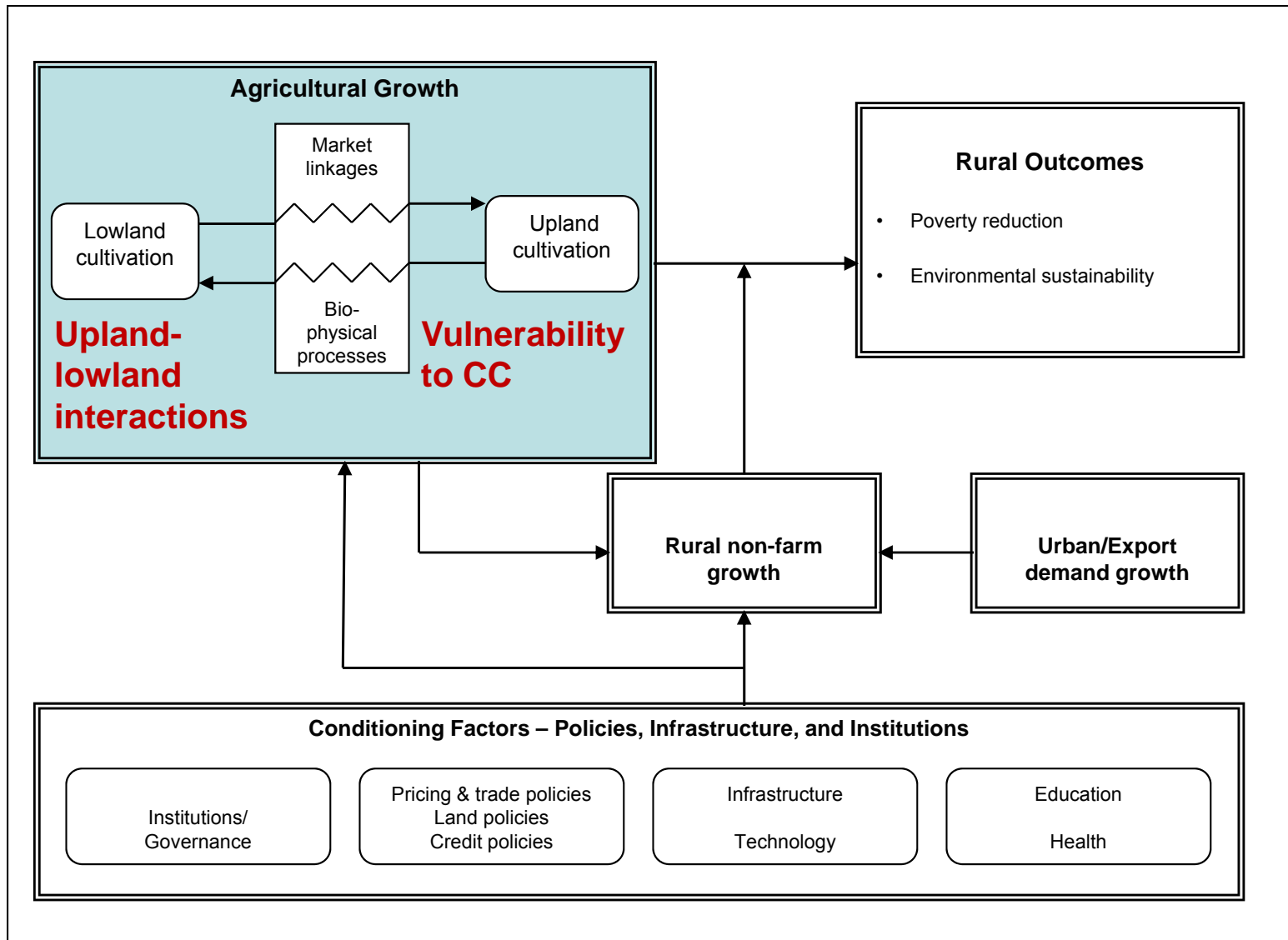
Note: Other provincial fixed effects that are not statistically significant are not shown. These variables include local political characteristics, urban-rural disparity, and schooling of household head.
Source: Fuwa, Balisacan, and Bresciani (2009)

- Non-agri growth elasticity of poverty reduction is influenced by initial levels of
 - Income inequality
 - Human capital
 - Infrastructure development
- Agri growth elasticity is higher in areas where
 - Agricultural productivity potential, based on geo-physical endowment, is high
 - Low level of urbanization

Concluding remarks

- ✦ No “one size fits all” pathway out of rural poverty
- ✦ Increasingly, non-agricultural income growth has been the main engine for poverty reduction.
- ✦ Agricultural development remains to have high potential as driver of poverty reduction in:
 - *Areas with high agricultural productivity potentials (based on geo-physical endowments)*
 - *Relatively ‘more rural’ (remote, less commercialized) areas*
 - Increasingly, non-agricultural income growth has been the main engine for poverty reduction.
- ✦ Future research directions:
 - *Refining characterization of landscape to capture upland-lowland interactions*
 - *Integrating vulnerability-to-climate-change indicators*

Vulnerability to CC, agricultural growth & rural welfare outcomes



Thank you!
Salamat!