



INTERNATIONAL
FOOD POLICY
RESEARCH
INSTITUTE

Modeling for Policy Impact

Mark W. Rosegrant
Research Fellow Emeritus
IFPRI

Draws upon World Bank-funded research on ENSO impacts and responses in the Philippines by Mark W. Rosegrant, Jawoo Koo, James Thurlow, Rowena Valmonte-Santos, Ricky Robertson, Leocadio Sebastian, and Angga Pradesha.

Outline



- Entry points for model-based approaches – when are models useful? Or, how do you make models useful?
- Primary strategies for abating food shock crises
- Decision contexts – interventions/investments/policies for response or resilience?
- Types of information and tools used, additional information and tools desired
- Example: Assessment of ENSO impacts and policy responses in the Philippines

Making Models Useful for Policy Analysis and Impact



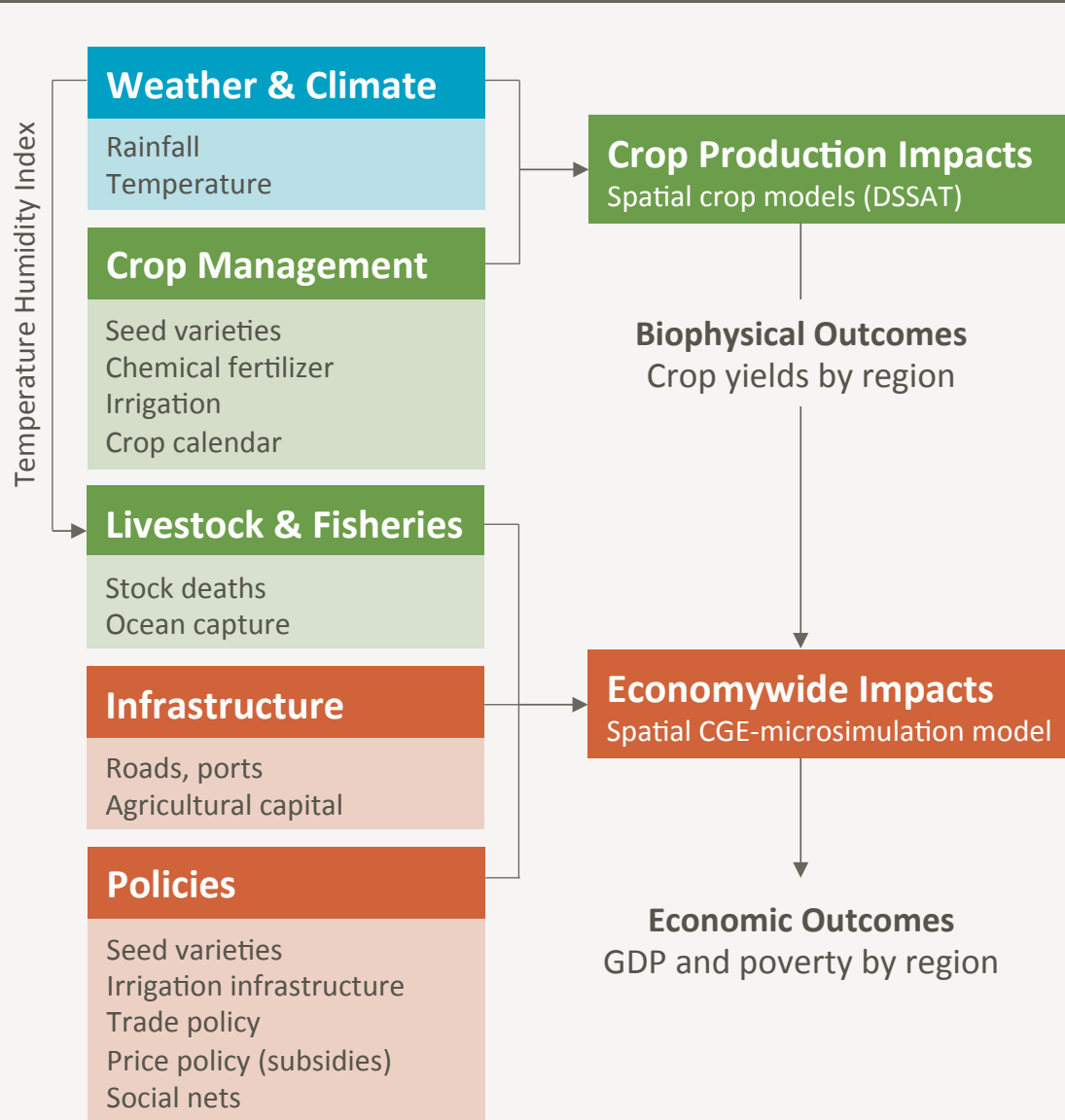
CHALLENGES	RESPONSES
Asking the right questions	<ul style="list-style-type: none">• Find out the needs and intentions of the stakeholders (Philippine National Economic and Development Authority, Department of Agriculture, World Bank)
Modeling design useful to policy- and decisionmakers	<ul style="list-style-type: none">• Improve modeling design• Integration of biophysical-hydrology-economics• Multi-scales – local, national, regional• Consistent upscaling and downscaling across levels• Greater spatial disaggregation to address sub-national issues
Information for enhanced understanding	<ul style="list-style-type: none">• Better description and presentation• Use of interactive models
Transparency, training, transfer, and open access	<ul style="list-style-type: none">• Seek to transfer models to stakeholders• Encourage transparency through open access for effective policy outreach



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Measuring Economic & Social Impacts

Spatial Agriculture-Economy Models

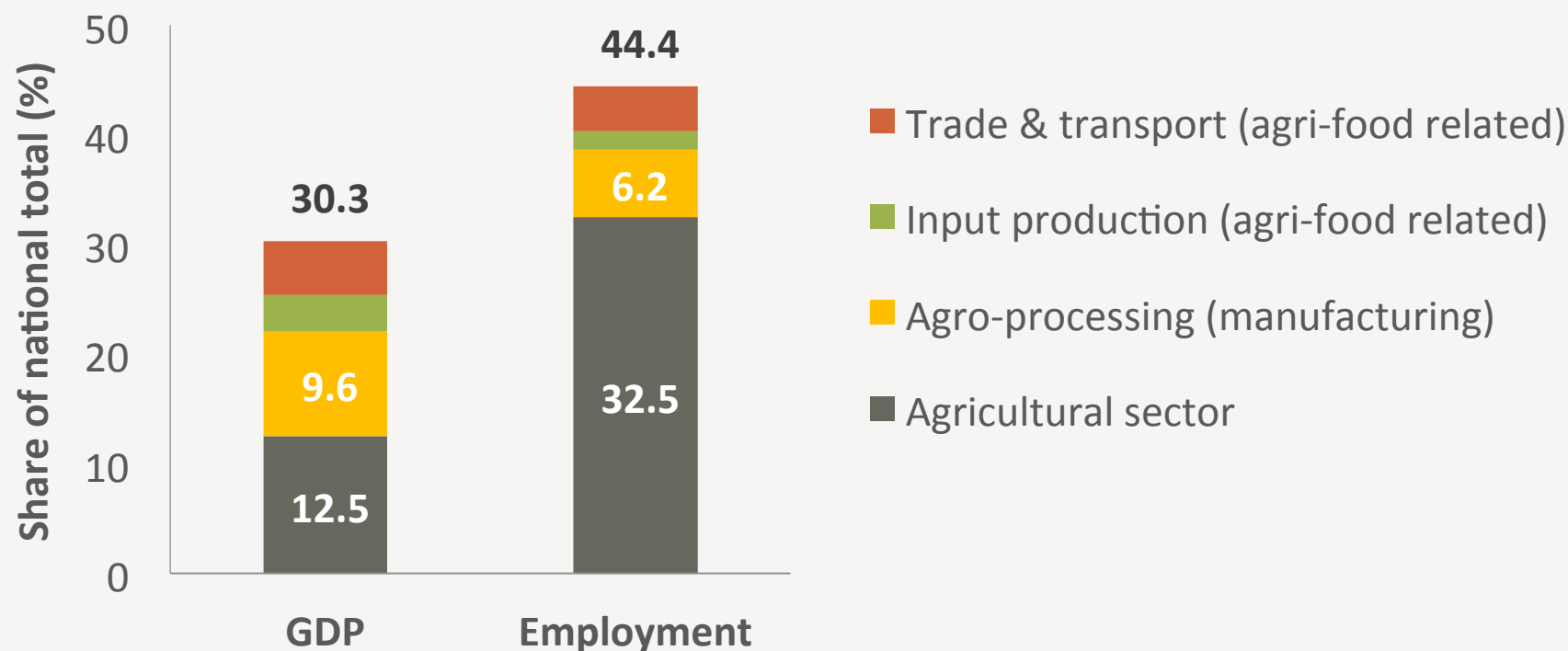


Agriculture-Food System



- Agricultural shocks spillover to broader food system and economy

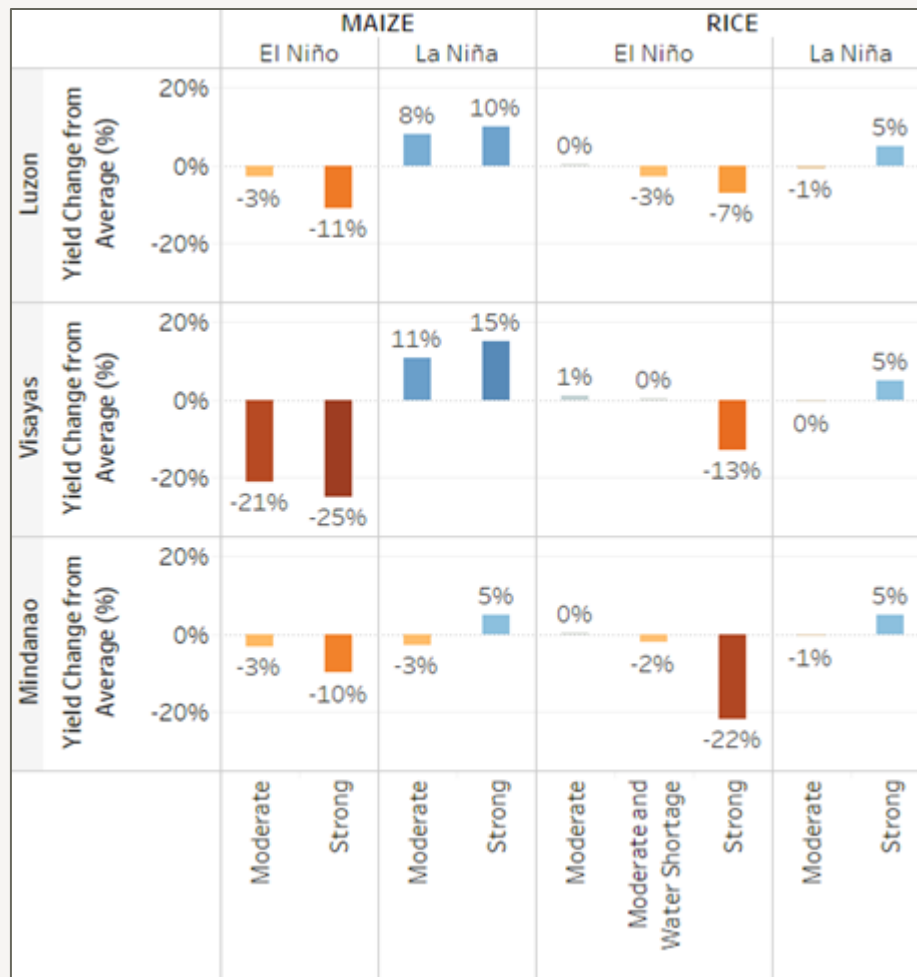
Agri-Food System GDP and Employment, 2011



ENSO Impacts on Crops

- Predicted yield impacts vary by crop and region
- Yields fall during El Niño and rise during La Niña
- La Niña yield gains are smaller than El Niño losses

Crop Yield Deviations During ENSO Events

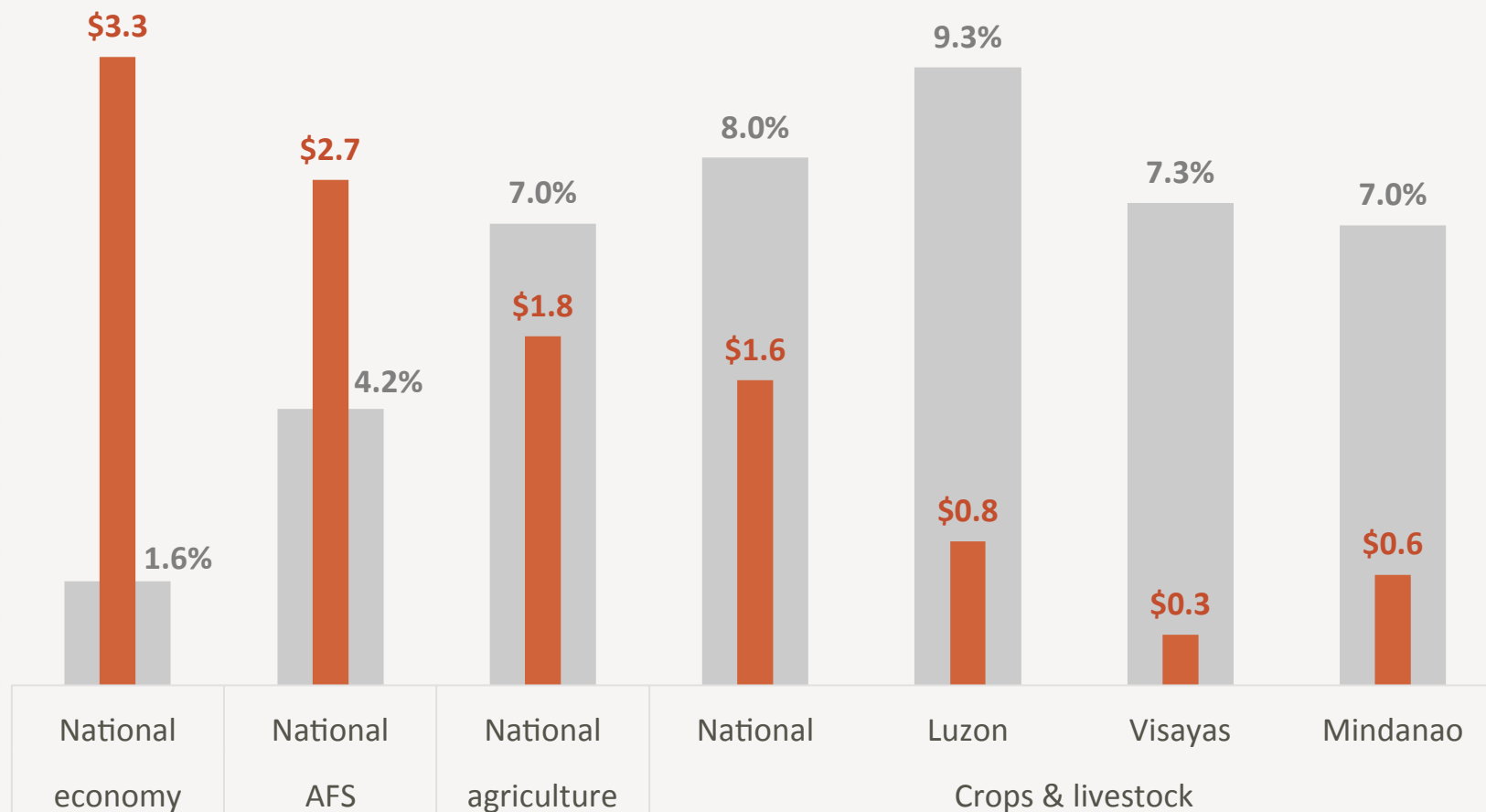


Source: Gridded DSSAT crop model simulations weighted by IFPRI's spatial agricultural production database

GDP Falls During El Niño



Average GDP Losses During El Niño Relative to Non-ENSO year
(US\$ billions or % reduction)

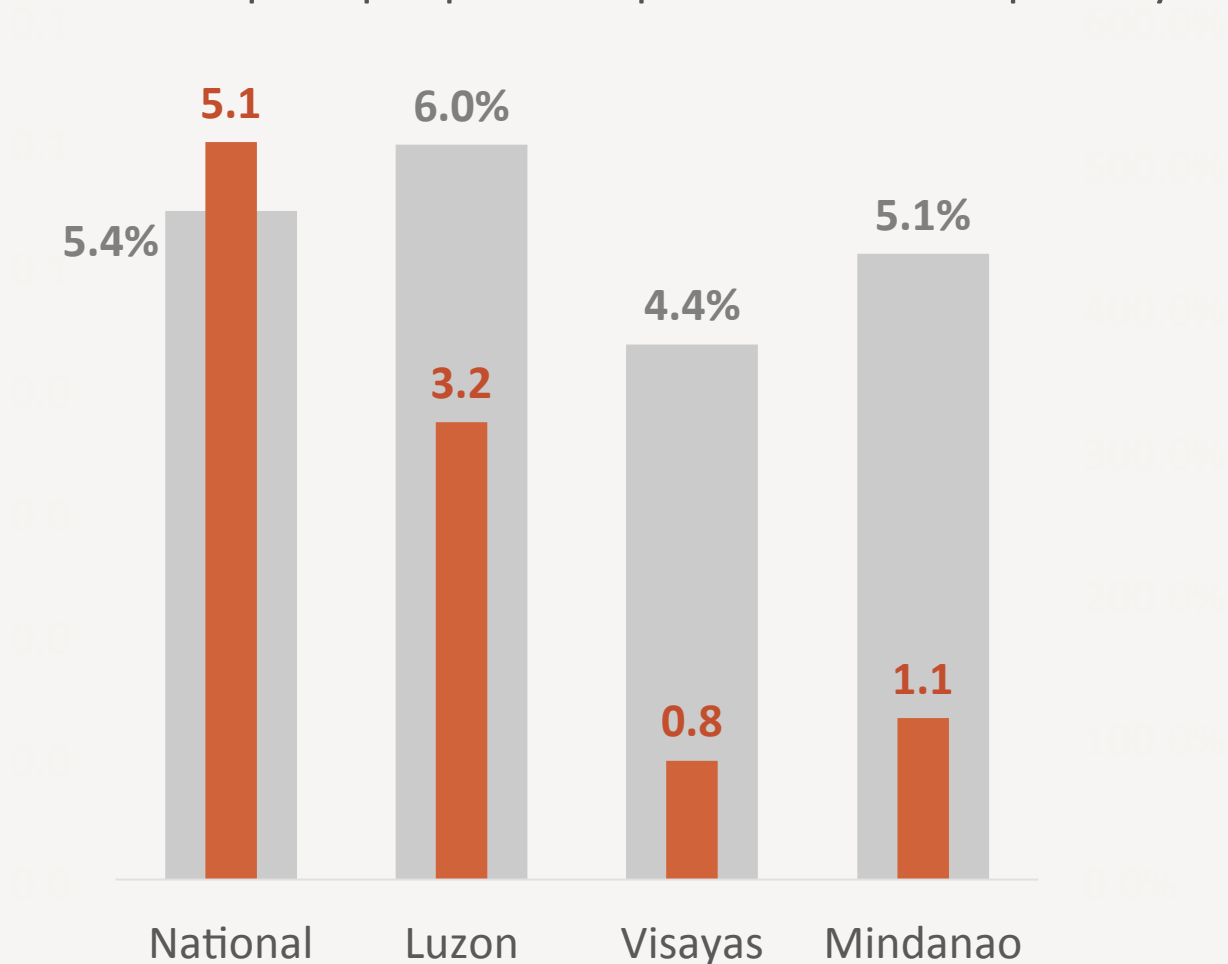


Poverty Rises During El Niño



Poverty Rises During El Niño

(Millions more poor people or %-point increase in poverty rate)





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Policies to Reduce Economic Costs

Range of Policy Interventions



On-farm

- **Drought-tolerant seed varieties**
 - 3% smaller yield losses during El Niño years
- **Additional irrigation**
 - 5-8% more land is irrigated in each region

Market

- **Subsidize food imports during shock**
 - 25% price subsidy on cereals, 100% subsidy on processed foods
- **Remove rice import quotas**
- **Distribute stored grains**
 - 500,000mt rice and 100,000mt maize distributed through markets

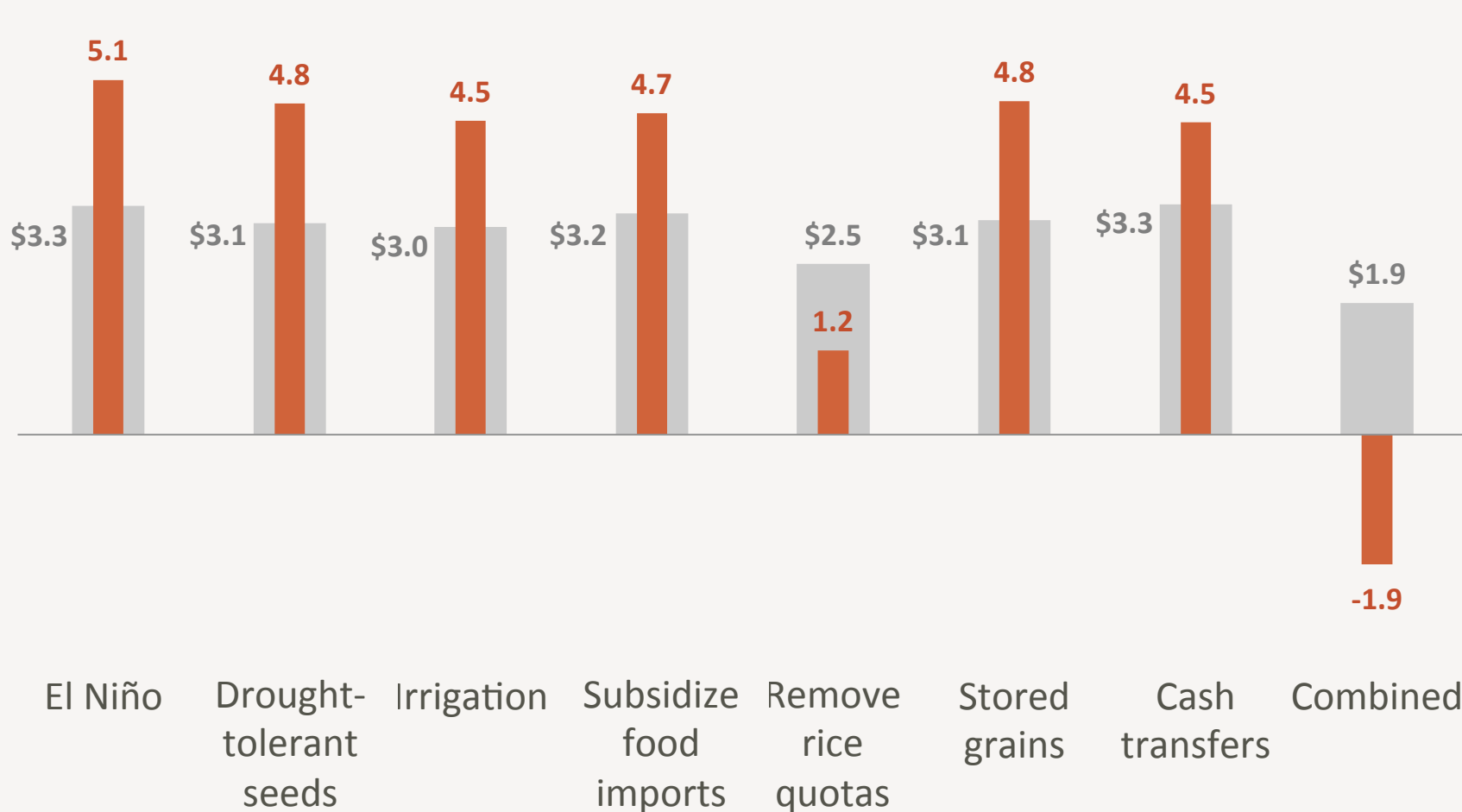
Social

- **Cash transfers for poor households**
 - US\$15 per person in poorest three income quintiles

Offsetting GDP and Poverty Impacts



Policy Curbs GDP Losses and Poverty During Strong El Niño Event
(US\$ billions lost or millions more poor people)



Summary of Policy Options



- **Philippine economy and its people are vulnerable to El Niño**
 - GDP declines by US\$3.3 billion during a strong event
 - 5.1 million more people fall below the poverty line
- **Policies can reduce some of the damages caused by ENSO**
 - But no single type of policy can protect all people in all regions
- **Need a portfolio of on-farm, market and social policies**
 - On-farm policies directly offset GDP losses
 - Market interventions often benefit consumers more than producers
 - Social policies directly target the poor
- **Need to offset short-term losses and build long-term resilience**
 - Market and social interventions are shorter-term emergency responses
 - On-farm investments contribute to resilience and development



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Actions to Enhance Resilience to ENSO

Improving ENSO Preparedness—Less Amenable to Modeling, Need Qualitative Analysis



■ Enhance Forecast and Early Warning Systems

- Challenge: EWS not early/detailed enough to fully benefit local farmers
- Goal: Exploit El Niño's slow onset to give extension agents and farmers time to respond/adapt

■ Strengthen Local Government Capacity

- Challenge: Delays in aid delivery blamed for 2015/16 violence in Kidapawan
- Goal: More timely and effective delivery of aid and services in emergency

■ Improve ENSO Financing Mechanisms

- Challenge: Fast-track funding for El Niño responses delayed in 2015/16 by Senate and disbursement rules
- Goal: Speed up investments in preparedness and responses to ENSO impacts

Enhancing Food System Resilience— Addressed by Modeling



- **Invest in Farmers' Awareness and Adaptive Capacity**
 - Goal: Promote crop diversification, drought-tolerant seed varieties, and cost-effective irrigation rehabilitation/expansion
- **Improve Rural Infrastructure**
 - Goal: Invest in and maintain roads, bridges, and other infrastructure to remove bottlenecks and increase markets' ability to respond to ENSO events
- **Remove Rice Import Quotas, Store More Grains**
 - Goal: Use markets to smooth price fluctuations for consumers
- **Strengthen Social Safety Nets**
 - Goal: Mitigate immediate welfare costs of ENSO shocks