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CIAT

Centro Internacional de Agricultura Tropical
International Center for Tropical Agriculture

Global headquarters, Cali, Colombia
Asia regional office, Hanoi, Vietnam

The food-environment-culture nexus for a climate-resilient future

Dindo M. Campilan, *Director for Asia*

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This presentation

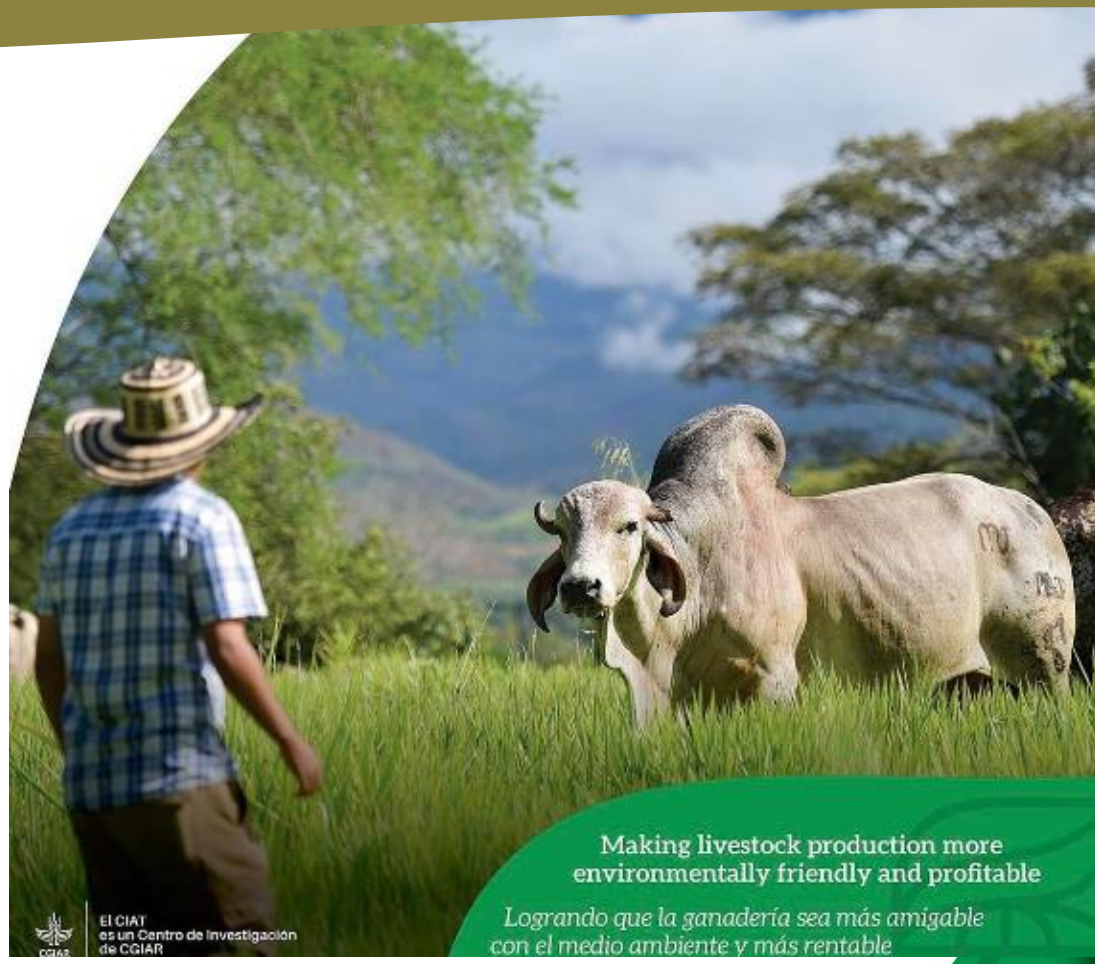
- **WHY** look at the nexus of ***food, environment & culture***
- **WHAT** is the bigger picture: the ***changing agric R&D agenda***
- **WHO** **we are: CIAT for a *sustainable food future***
- **HOW** to nurture knowledge networking with ***global science***

1. The *food-environment-culture* nexus

Environmental footprints of livestock prodn

TRENDS

- Optimizing **livestock productivity** (output per unit of land/feed/energy input)
- Promoting **integrated bio-resource mgt** for livestock-crop systems
- Managing livestock sector **impact on climate change** (GHGs)
- Changing **diets & demand for animal products**, as key driver of climate action



Influence of food cultures & market demands on crop prodn

TRENDS

- Optimizing on-farm **crop productivity**
- Managing **“boom” crop phenomenon** as key driver of agricultural livelihoods
- Assessing trade-offs and benefits from **competing food and other enduses**
- Consumers and markets as **“enablers” of crop biotic-abiotic stresses**

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Ecosystem services for sustainable agri-landscapes

TRENDS

- Sustaining **use of natural resources** to support agriculture
- Managing tensions between **agricultural and other landuses**
- **Valuation of ecosystem services** for human & agro-ecologies
- **Bridging scales:** managing innovation from farms to landscapes

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2. The *changing R&D agenda* for agriculture

The changing agricultural R&D agenda

PRODUCTIVITY

Bridging yield gaps

SUSTAINABILITY

Conserving natural resources for future generations

RESILIENCE

Adapting to & mitigating to changing climate & other risks

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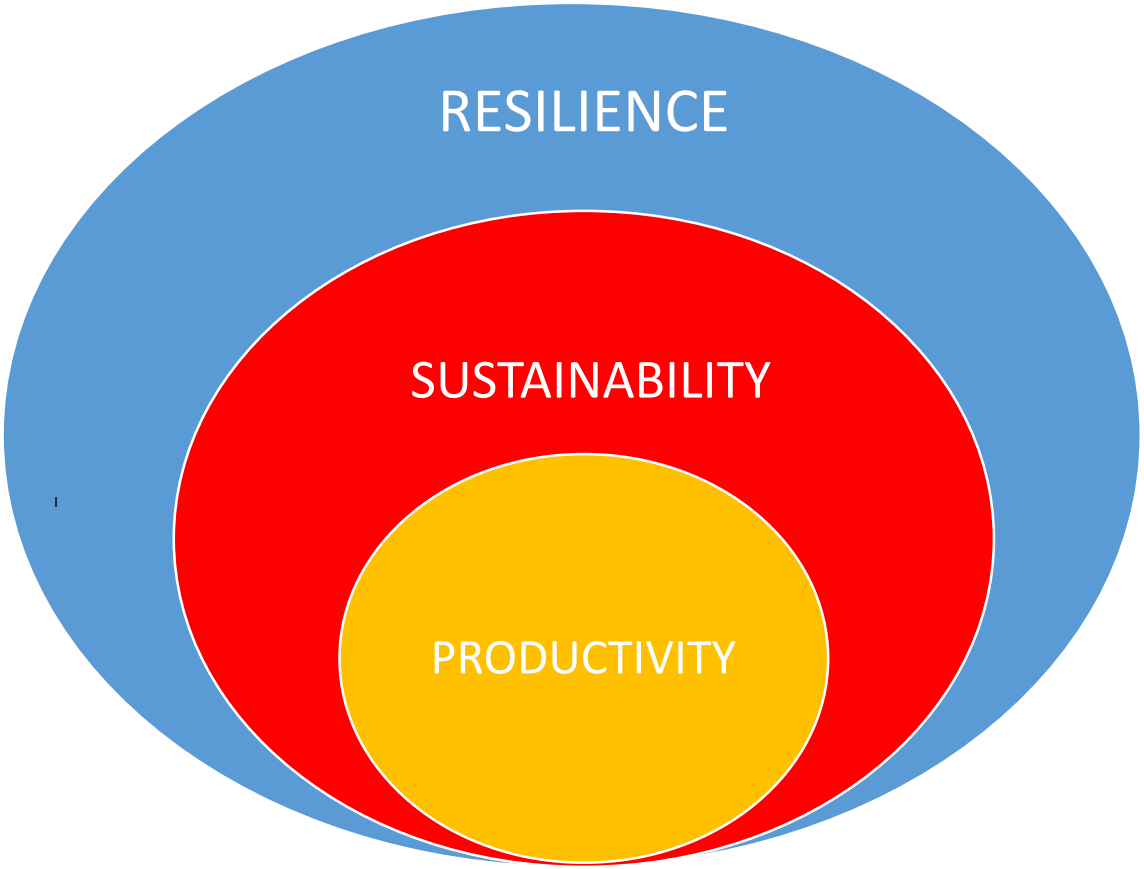
Eco-efficient agriculture for a climate-resilient future



How to produce more, with less, in an uncertain future

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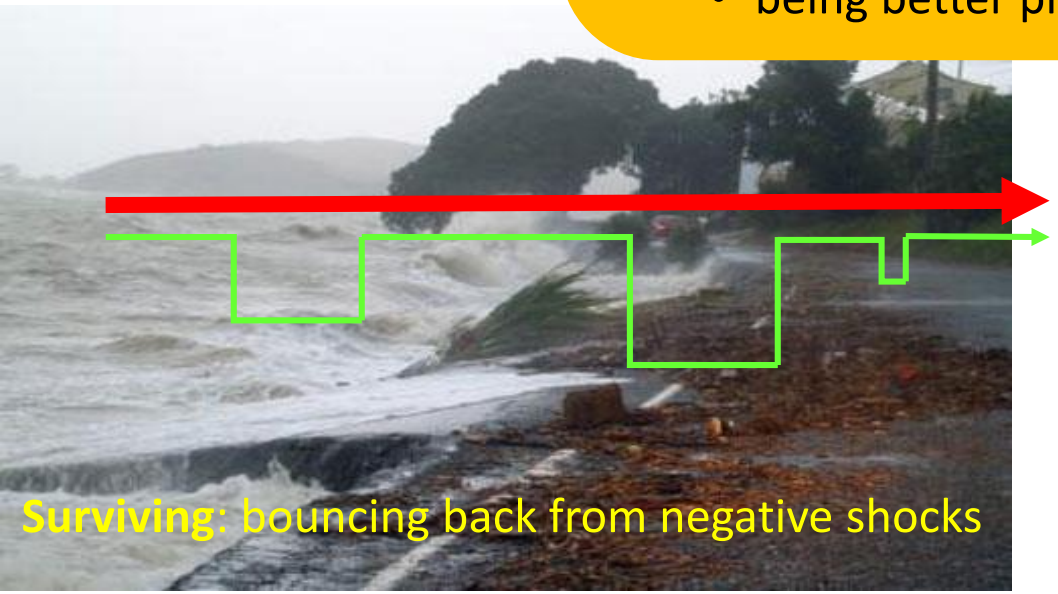
Redefining “resilience” and its metrics

- becoming better off than before shocks occurred
- being better prepared for the next ones



Surviving: bouncing back from negative shocks

3. CIAT research for a *sustainable food future*

CIAT research: *commodities, systems & futures*

Agrobiodiversity

- Bean
- Tropical Forages
- Cassava
- Rice
- Genetic Resources

Soils & Landscapes

- Sustainable Intensification
- Land Degradation
- Climate Smart Agriculture

Decision & Policy Analysis

- Climate Change
- Linking Farmers to Markets
- Ecosystem Services

CLIMATE CHANGE for Agriculture & Food Security

BIG DATA Platform

CIAT's global partnerships & operations

Headquarters &
Latin America & Caribbean hub
Cali, Colombia

Africa hub
Nairobi, Kenya

Asia hub
Hanoi, Vietnam

Operational presence in **56 countries** across 3 regions

Nearly **1,000 scientists** and support staff; $100M+ annual budget

CIAT collaborative R&D agenda in Asia

Cassava value chains

- Integrated, inclusive cassava value chains for diverse uses and markets
- Stable and sustainable yields through enhanced pest-disease, soil and seed system management
- Novel varieties for value addition and efficiency gains

Forages and livestock systems

- Improved forage options for more productive and sustainable livestock production
- Eco-efficient agricultural livelihoods in livestock-crop-tree systems
- Reduced livestock environmental footprint of smallholder agricultural systems

Agricultural landscapes & soil ecology

- Improved soil health and landuse management through conservation agriculture
- Bridging scales: facilitating agricultural innovation from farms to landscapes
- Sustainable farming systems for upland agriculture and integrated landuse systems

Climate change and ecosystem services

- Climate-smart agriculture for resilient communities and livelihoods
- Enhanced climate policies, services and institutions for risk-prone agricultural systems
- Improved ecosystem services for fragile agro-ecologies

Value chains and food systems

- More strategic public-private investment priorities in high-value agricultural commodities
- Inclusive businesses through greater market participation of small-scale producers
- Sustainable food systems for safe food and improved diet along the rural-urban transect

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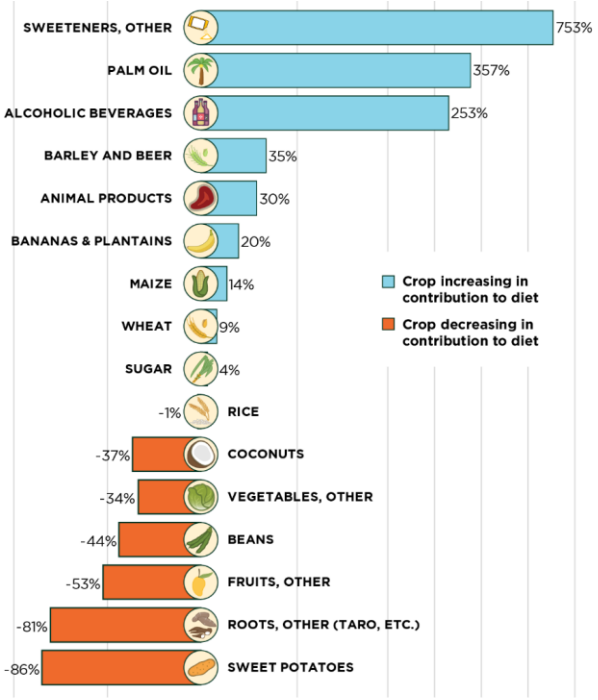
4. Knowledge networking with *global science*

CIAT science partnerships for a climate-resilient future

What we eat and how much - *changes in the last 50 years*

Over the last 50 years, the Philippine diet has changed dramatically, including greater quantities of oils, sugars, alcoholic beverages and animal products, and lesser amounts of vegetables, fruits, and traditional staples.

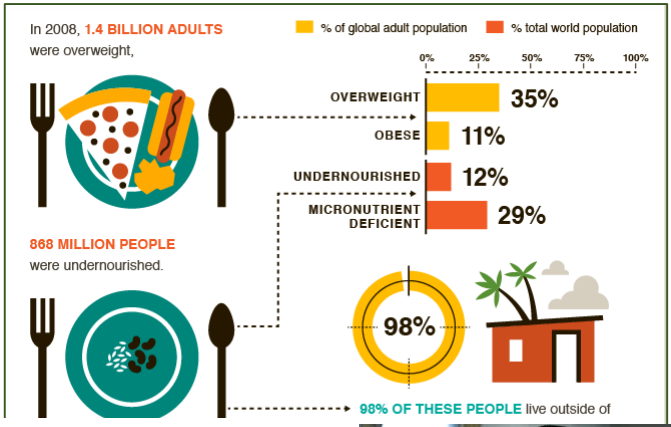
Relative change in the importance of crops and commodities to food energy (kcal/capita/day) in the Philippine food supply, 1961-2013

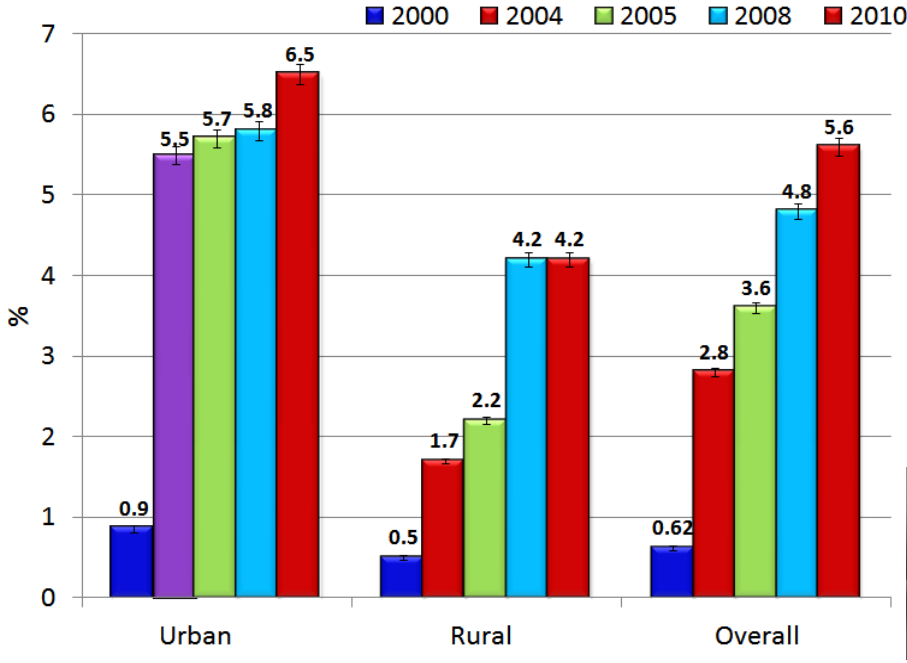


Source: CIAT

PHILIPPINES: filipinos are "sweeter" -- diet-wise

VIETNAM: growing menace of overnutrition *(prevalence of overweight U5 children)*





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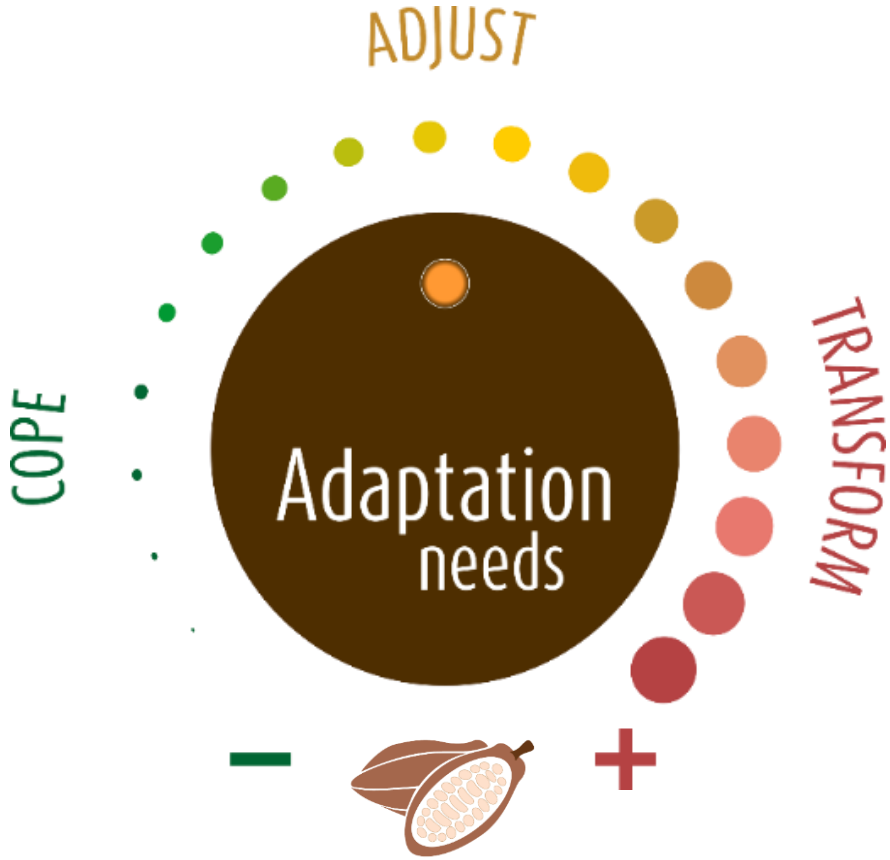
Investing *(or not)* in an increasingly uncertain & risky future



Investment guides for climate-resilient commodity value chains

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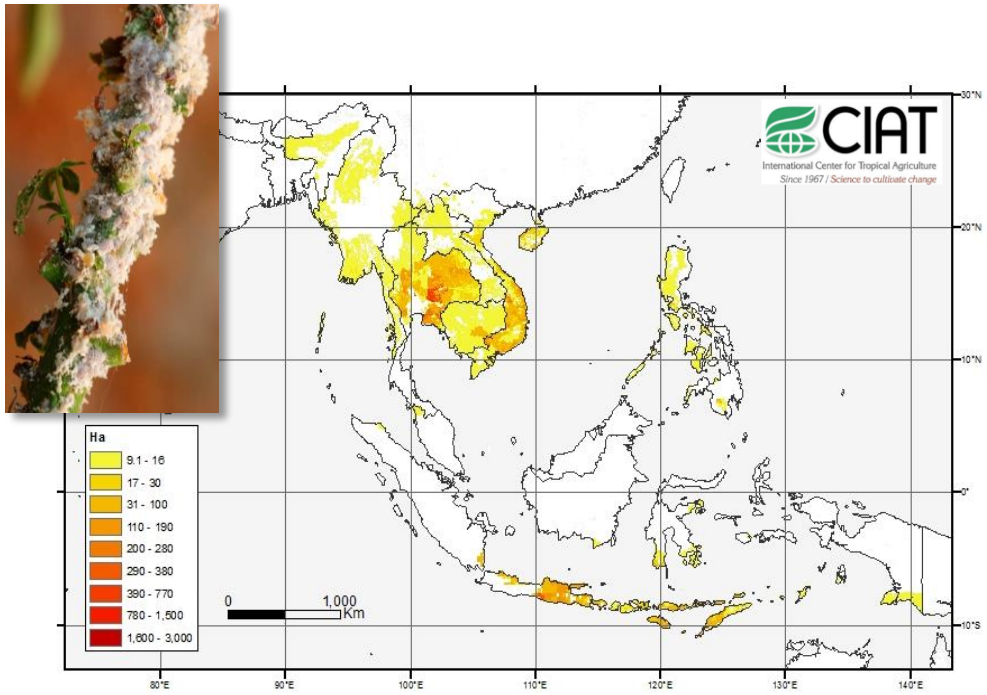
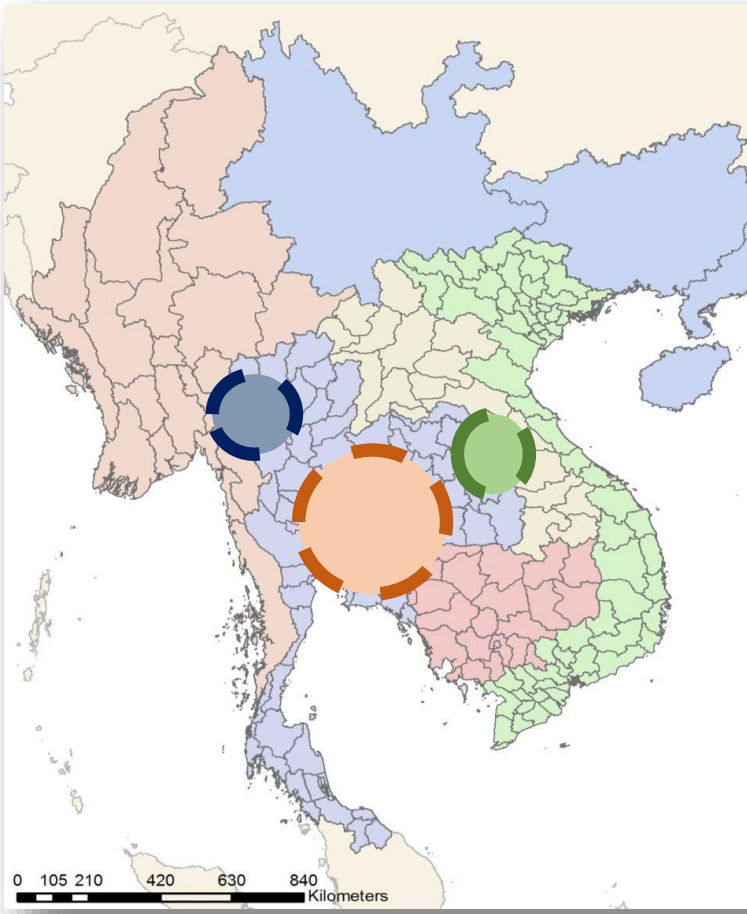
Transboundary surveillance of pest & disease risks: *cassava*



Patterns of migration/spread



Hotspots for CC-induced pests/diseases

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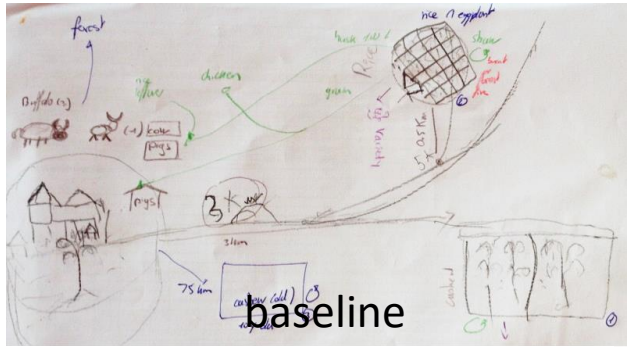
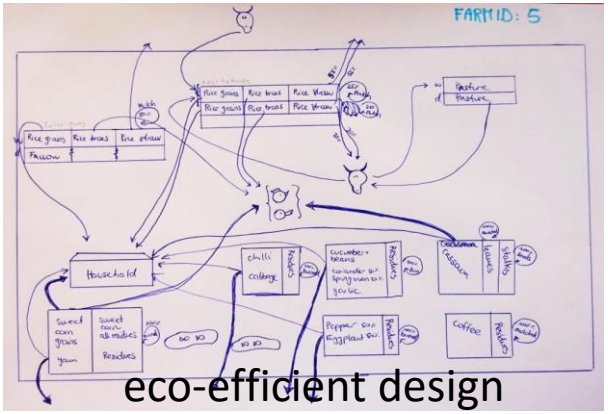
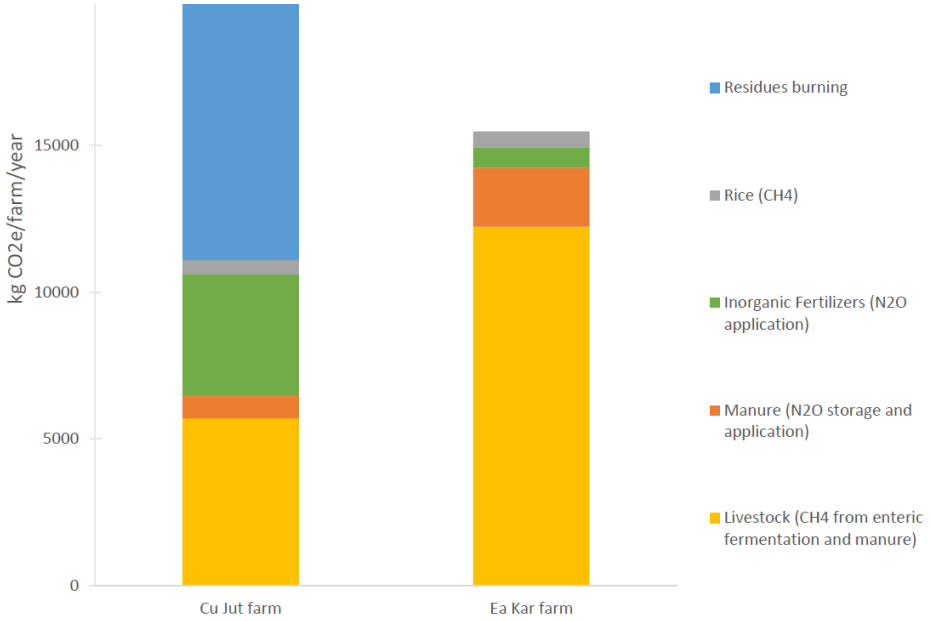
Co-designing livestock-crop systems towards eco-efficiency

Cambodia
nutrient flux





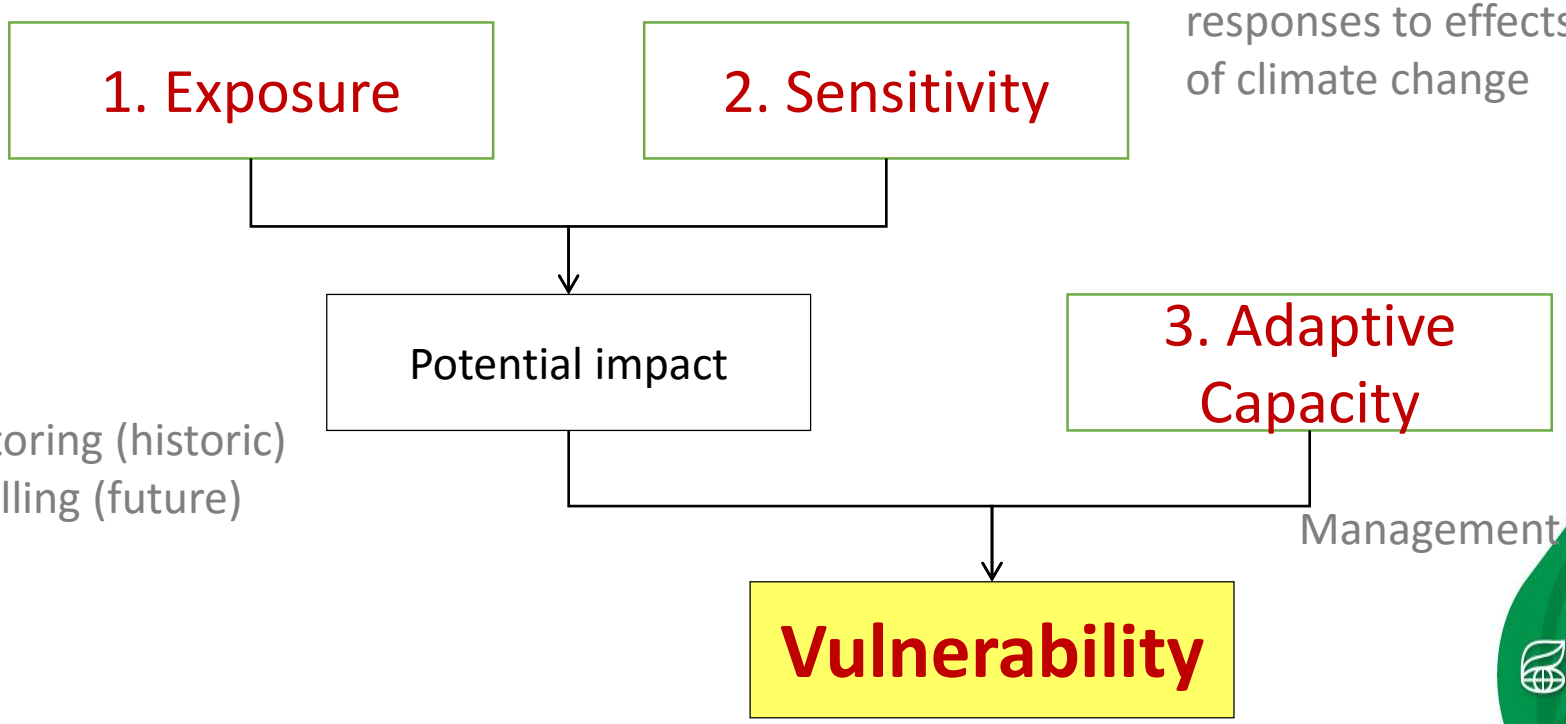
Vietnam
GHG emissions



How *vulnerable* is vulnerable to climate change?

Presence of an effect of climate change

Characteristics that defines different responses to effects of climate change



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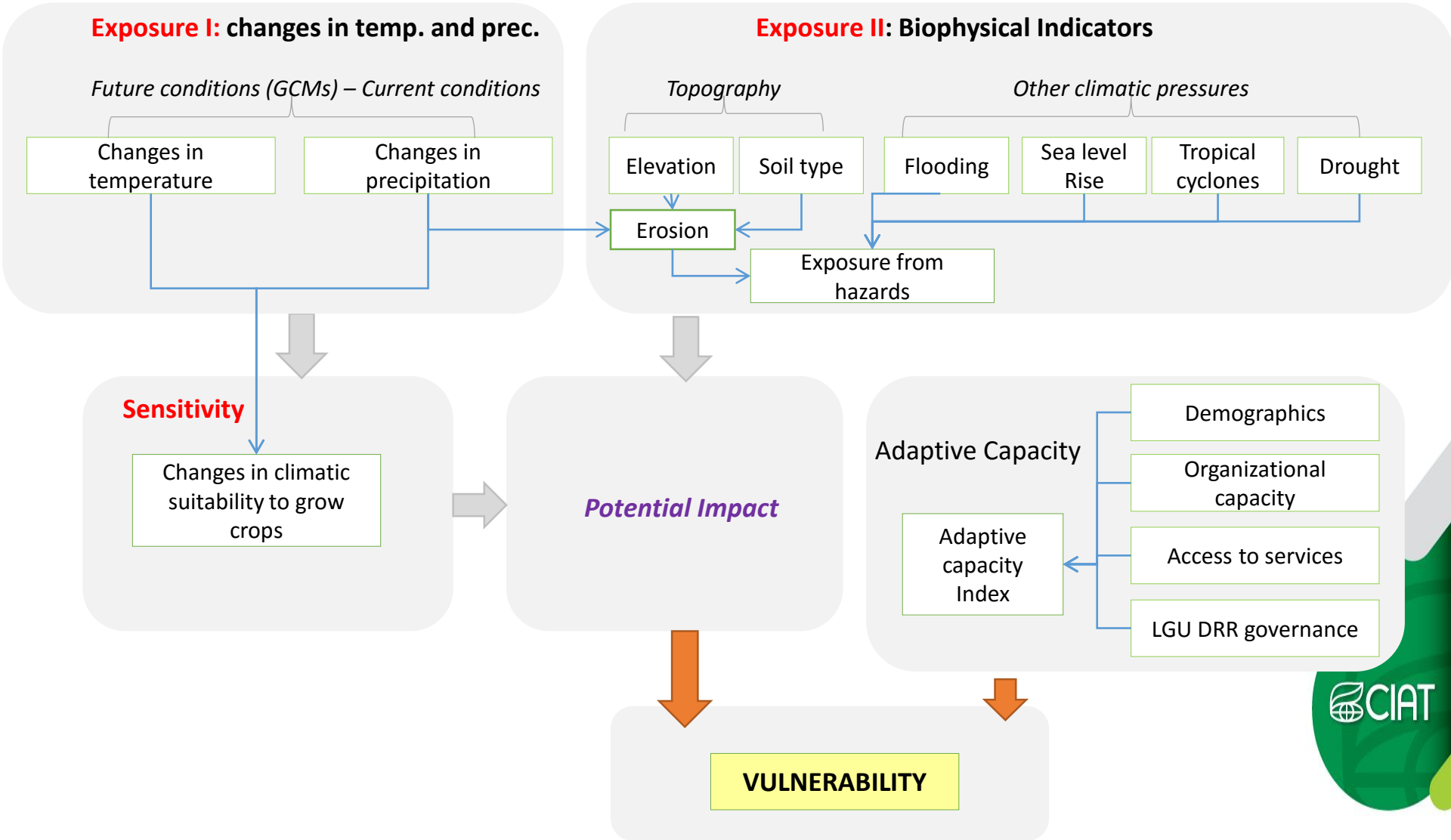

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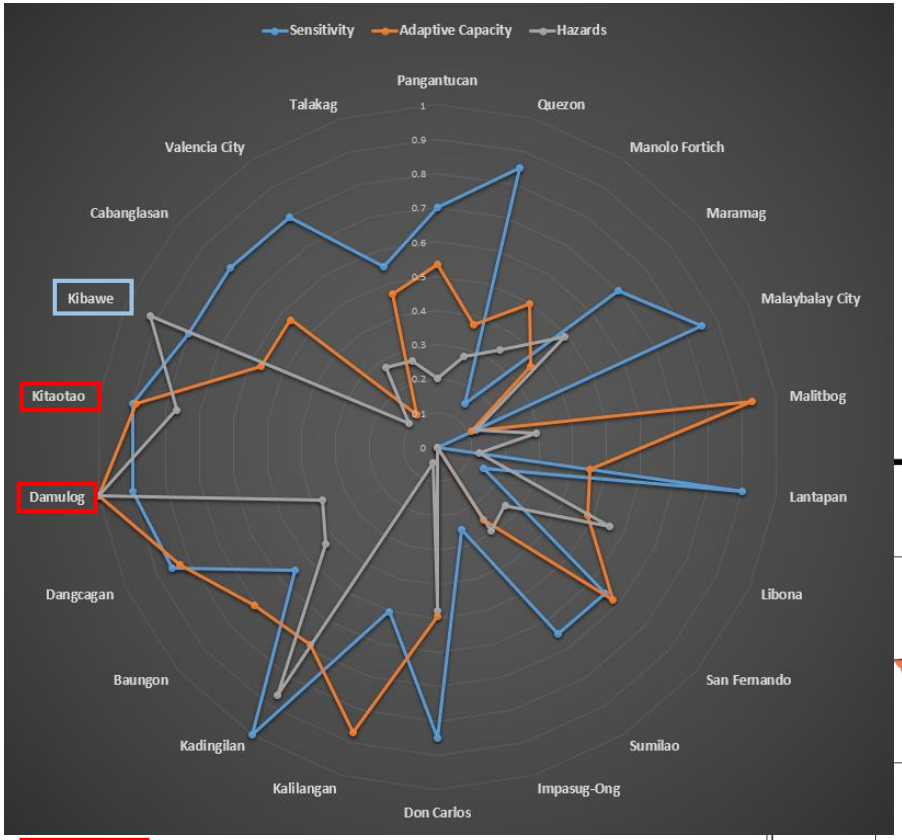
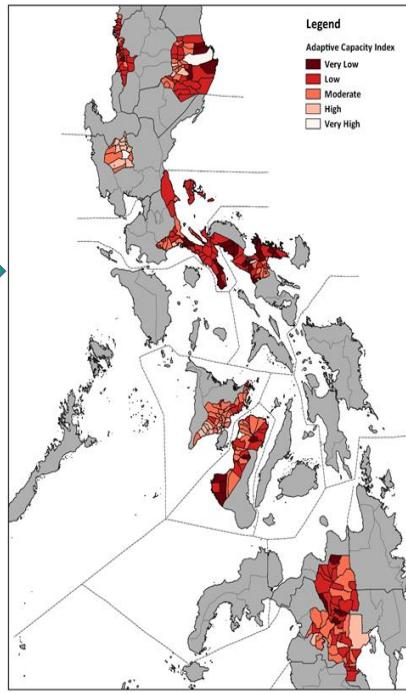


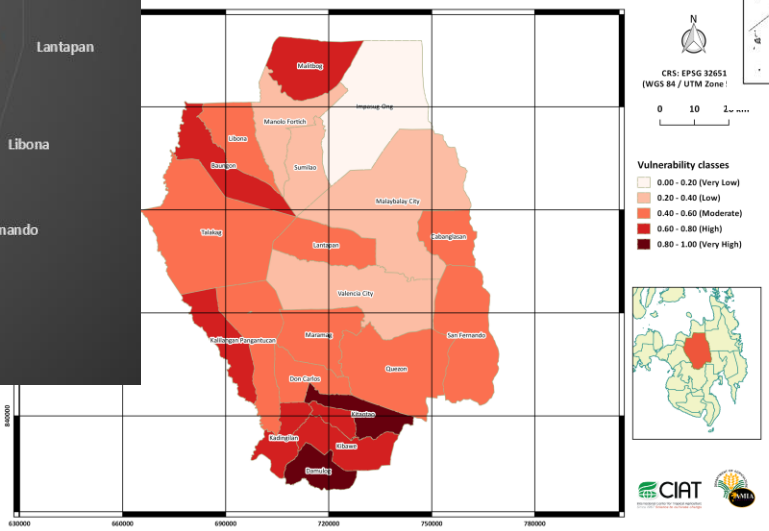
Highly vulnerable

High vulnerable

ADAPTIVE CAPACITY of key Phil provinces



CLIMATE RISK VULNERABILITY of Bukidnon municipalities



*Partner:*Central Mindanao University (CMU)

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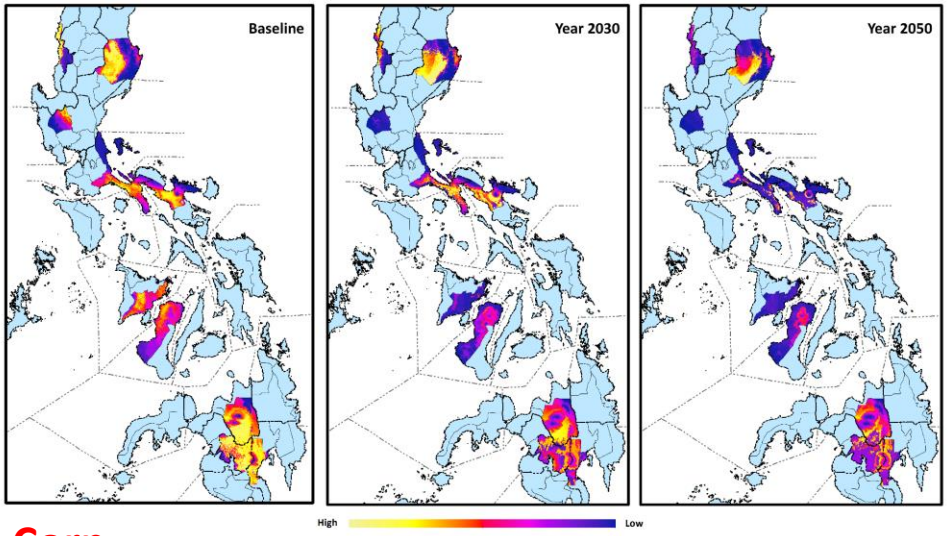
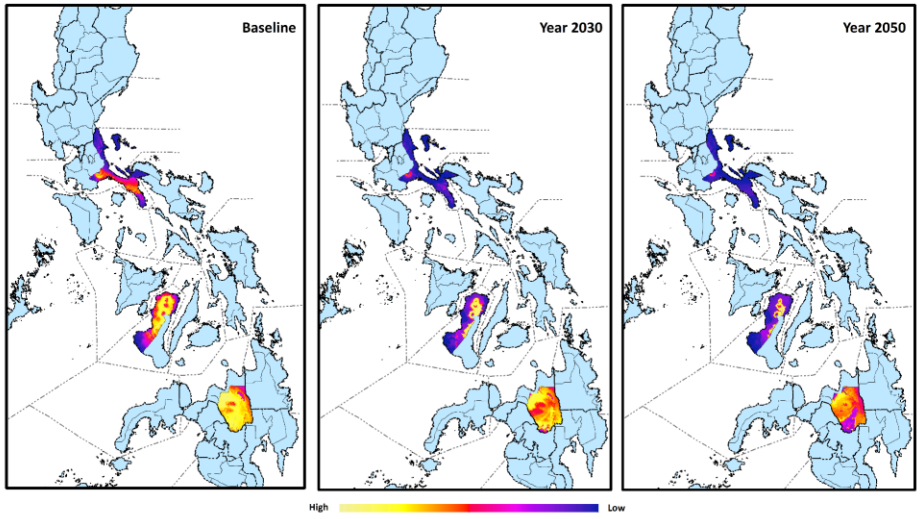
Under climate risks, what crops to grow – *and where and when?*



Corn

Coffee



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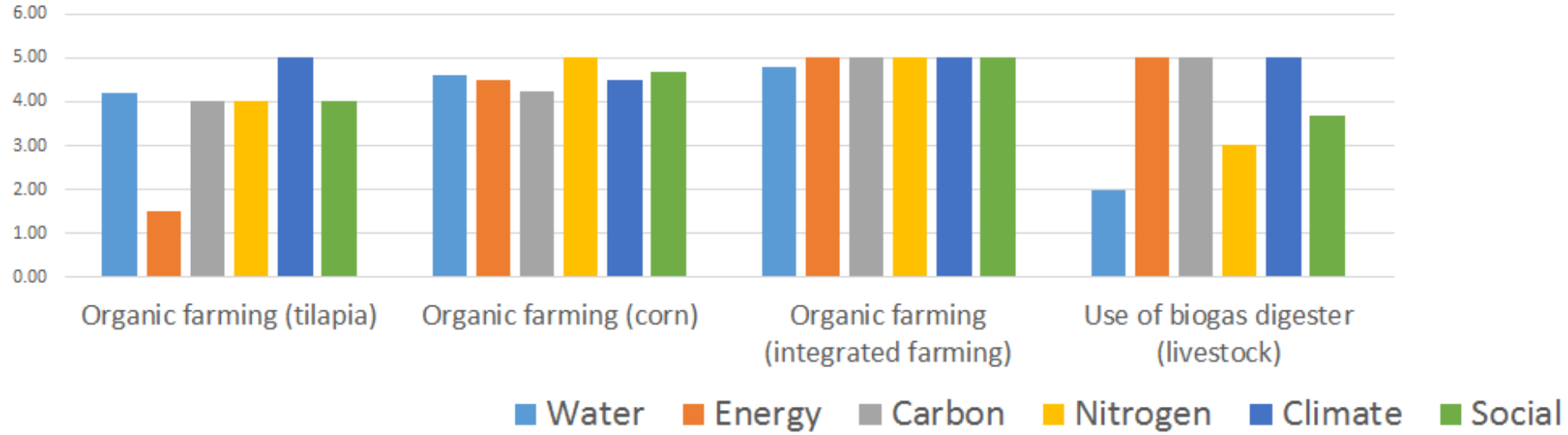
What are the *costs and benefits* of climate-adaptation options?



Cost & benefit (CBA) tool in assessing technologies for climate-resilient agrifisheries (CRA) in the Philippines (CIAT, DA-AMIA 2017)

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Rapid response via near *real-time monitoring of landuse change*

terra-i
An eye on habitat change

- Tool detecting natural vegetation loss in the whole tropics
- Near real-time system, producing maps every 16 days
- Monitor all types of vegetation across the tropics
- Current minimum changed area detected: 3 Ha
- Web tools available to visualize and download habitat status data (www.terra-i.org)

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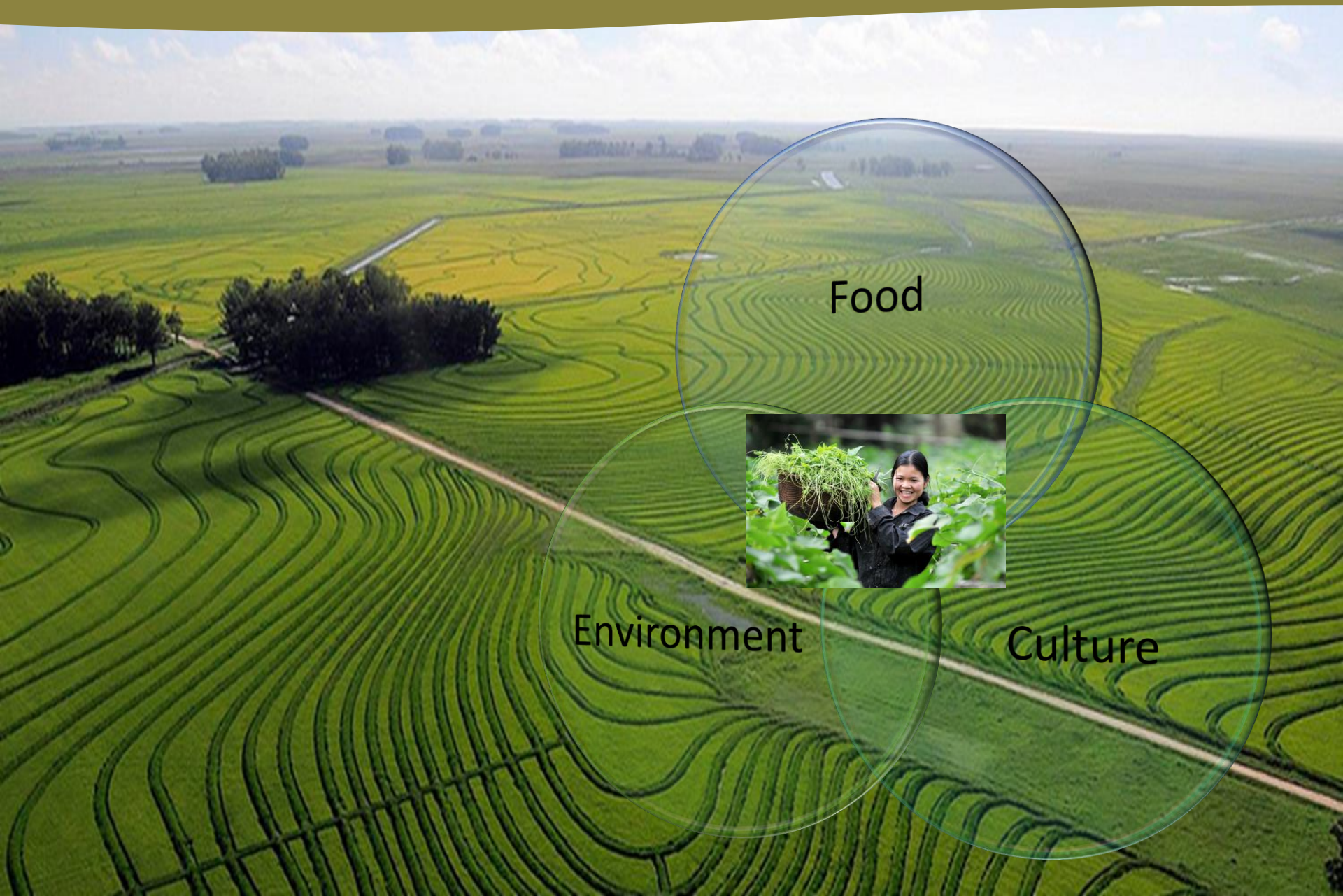
CIAT science partnerships for a climate-resilient future

Rapid response via near *real-time monitoring of landuse change*

This conference as platform for *dialogue and action*

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