Food and Agriculture Organization of the United Nations

# Landscape management for resilient value chains

APEC Climate Symposium 2017

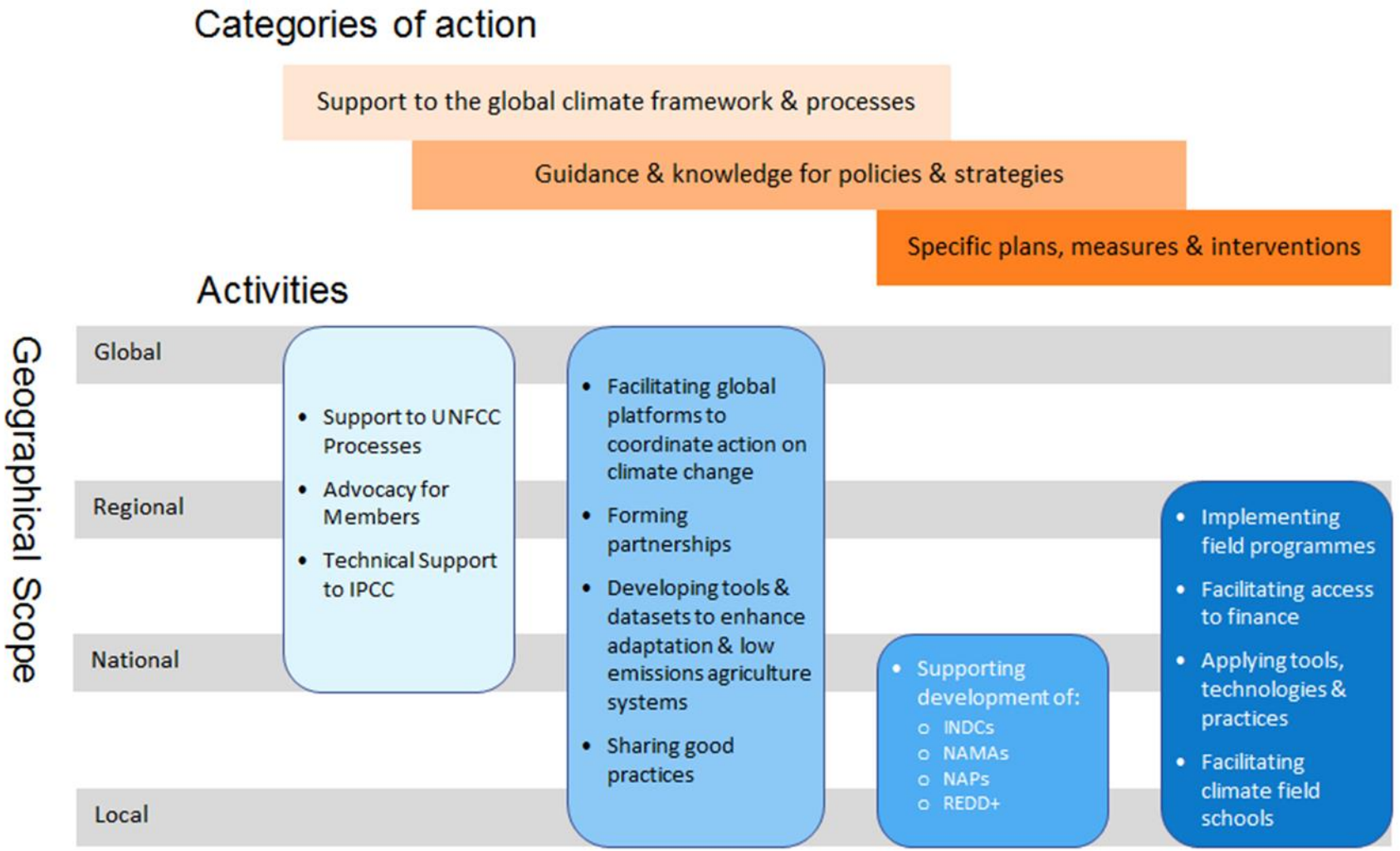
Monica Petri with Damen Beau and Rabi Rasaily - FAO

# Overview of the presentation

- Climate change and the role of FAO
- The challenge and the trends in South-East Asia
- Value chains and climate risk
- Climate smart landscapes for value chains integration
- Landscape initiatives working at multiple value chain levels in Asia
- Conclusions

# FAO role in climate change

# FAO role in climate change



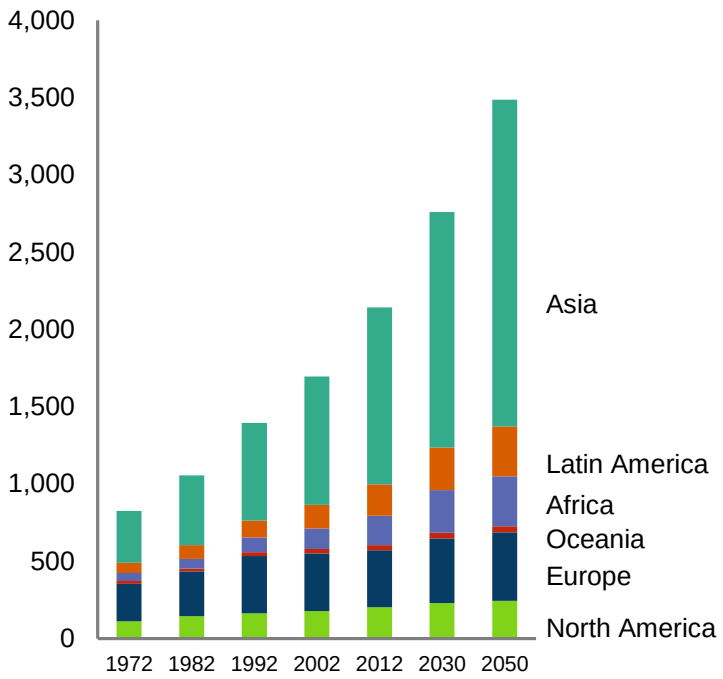
# The Challenge

Food production needs to grow..

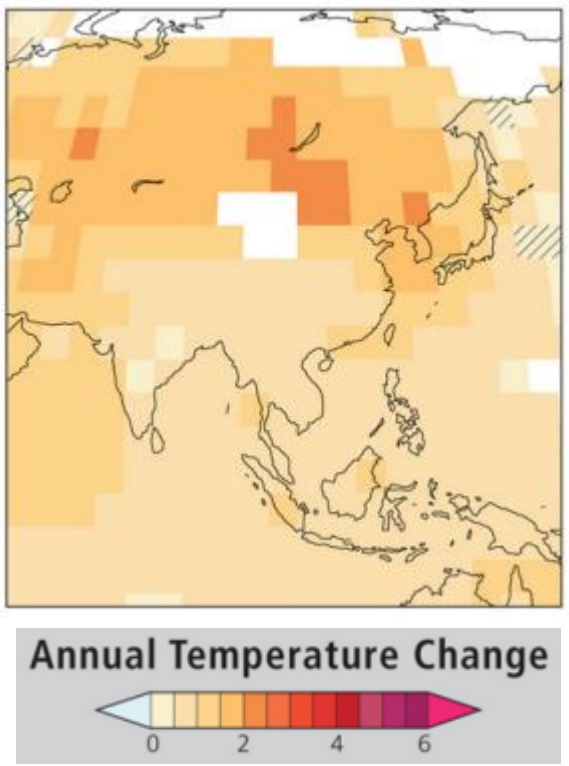
..in the face of a changing climate..

..while addressing GHG emissions.

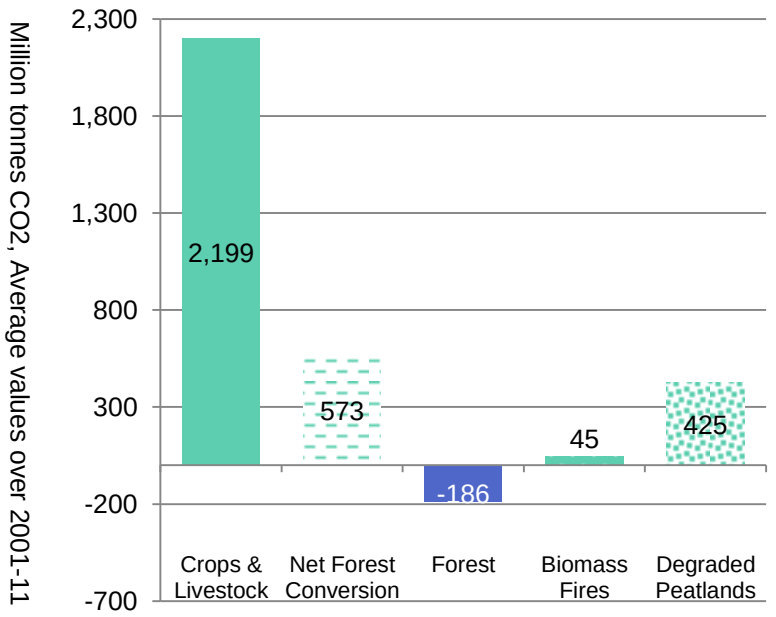
**Food Production by Region 1972-2050**
(Constant 2004-06 US$)




**Temperature trend, Asia, 1901-2012**
(annual trend change in degrees Celsius over period)



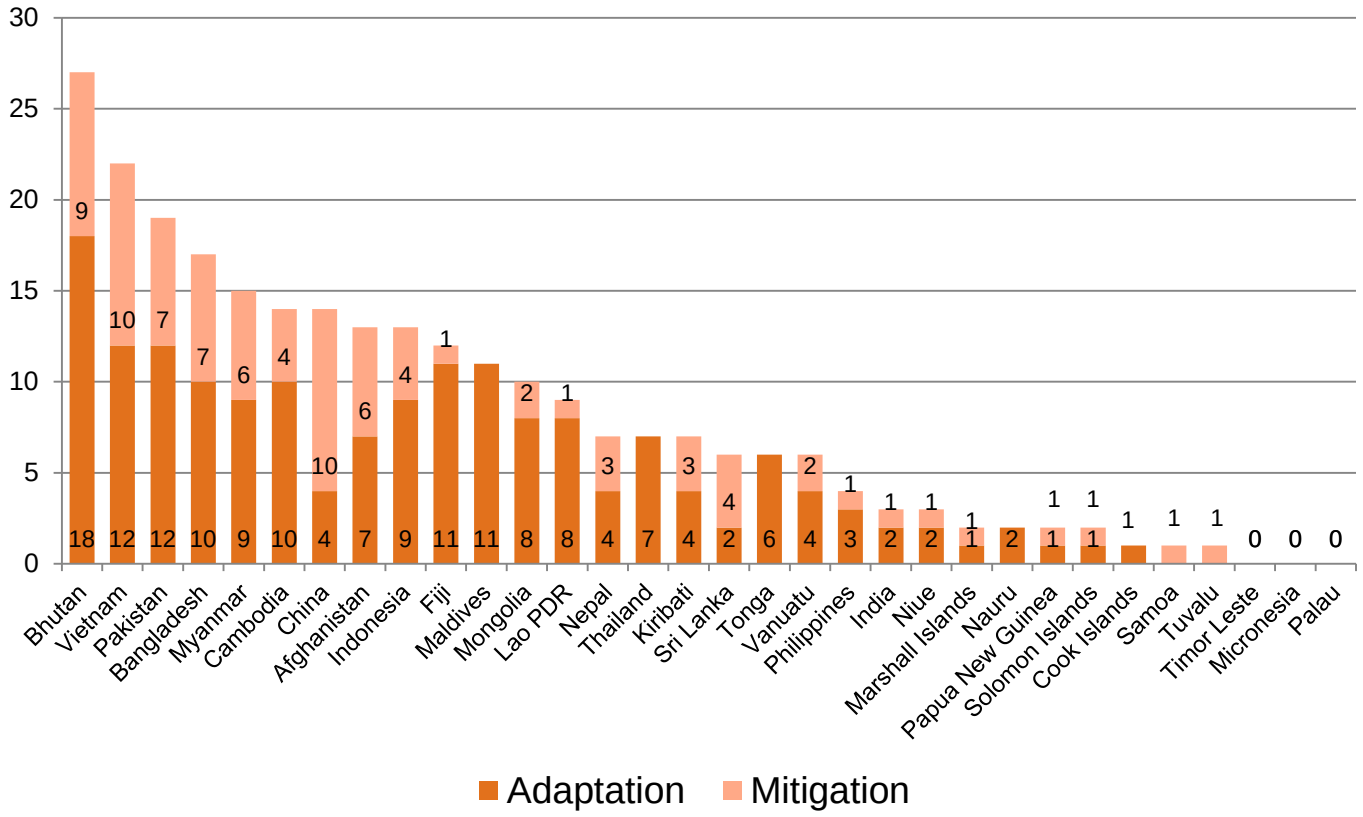

**Sources of emissions from agriculture and land use in Asia**
(average values 2001-2011)




Sources: California Environmental Associates, 2013 – based on FAO. 2012; IPCC, 2014; FAOSTAT, 2015

# 2030 Agenda provides a way forward

**Number of INDC actions for agriculture and land-use sectors in Asia-Pacific**
(by country)




Source: Authors

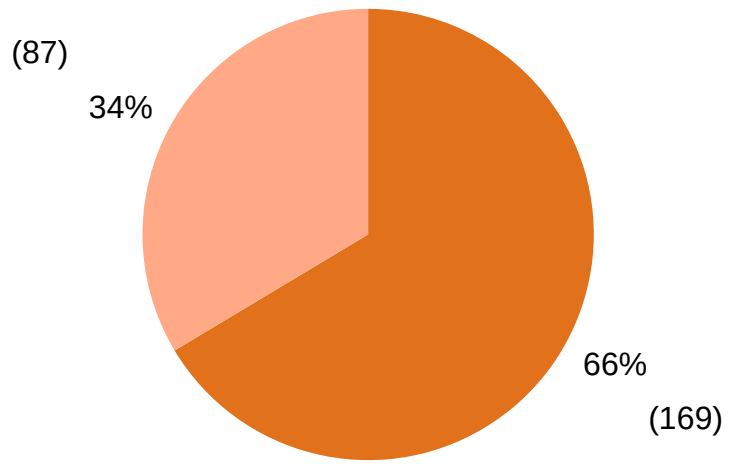
- Under the **Paris Agreement** countries in **Asia-Pacific** have **signaled agriculture** (crops, livestock, forestry, fisheries and aquaculture) as a **key concern**
- Countries have identified **256** INDC **priority actions** for the **agriculture** sectors
- In addition, **actions** to address climate change are an **“enabler”** for **SDGs**

# Priorities for climate action in agriculture

Adaptation is the most pressing concern…

**Share of INDC actions identified for the agriculture and land use sectors in Asia-Pacific by type**

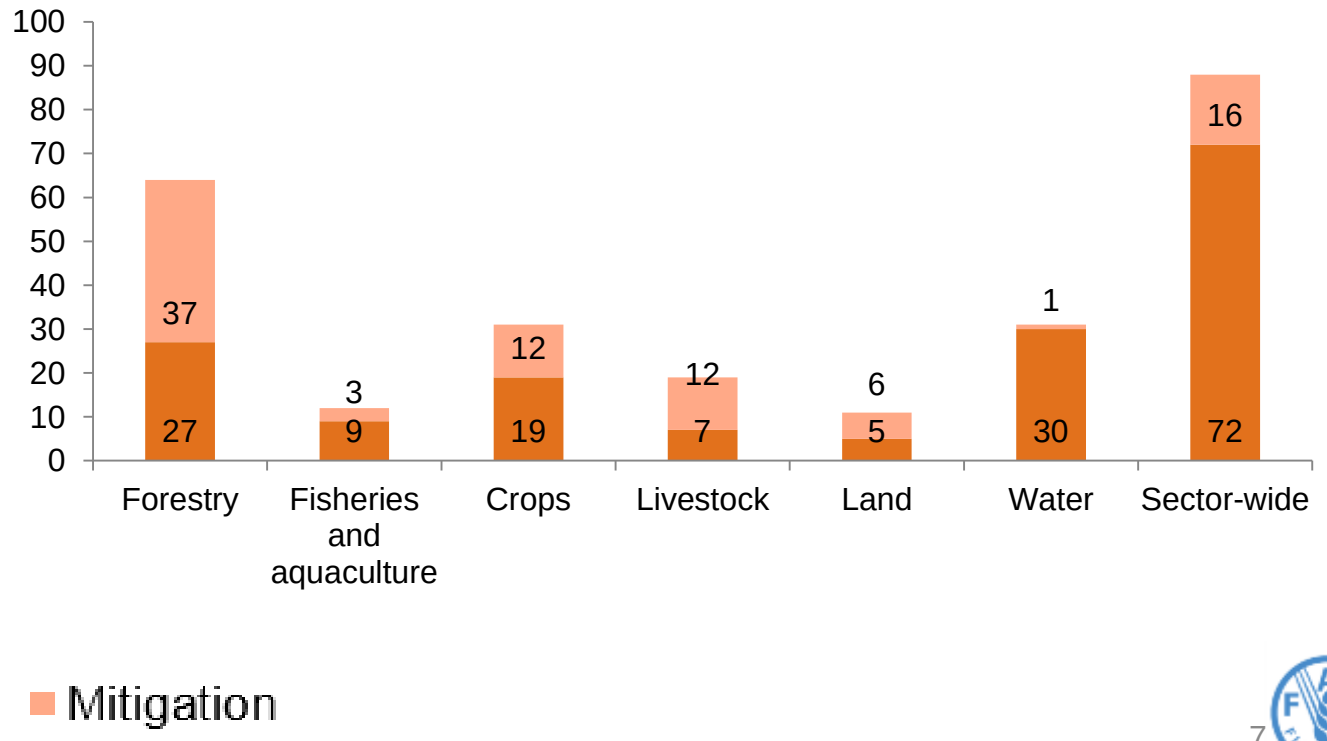
(percentage - number in brackets)




….and action is required across all agriculture sectors.

**Number of INDC actions identified for agriculture and land-use sectors in Asia-Pacific**

(by broad agriculture sector)

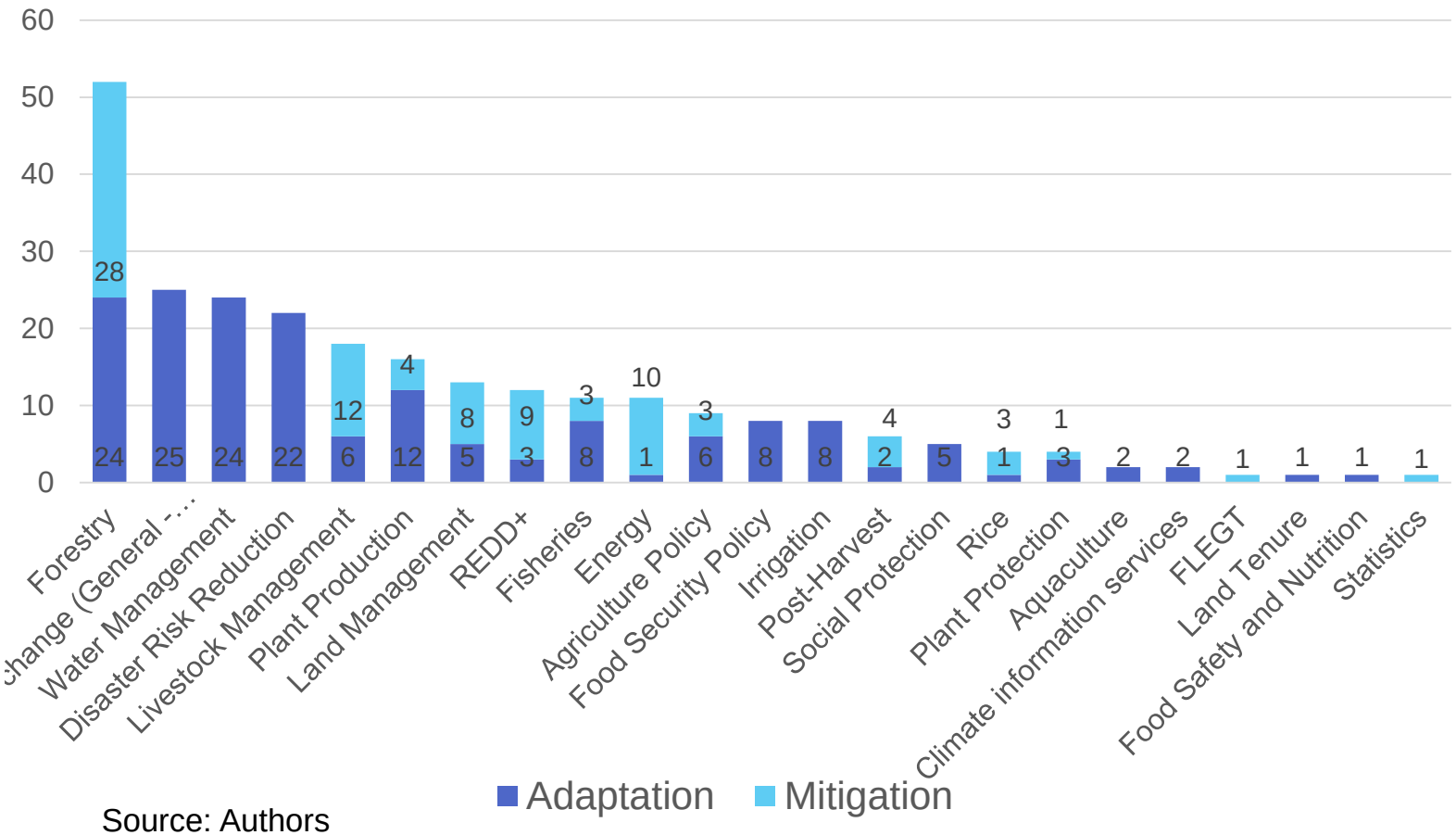



Source: Authors

# Areas of technical focus in Asia-Pacific

**Primary technical focus of INDC actions for agriculture and land-use in Asia-Pacific**

(number by focus category)




Source: Authors

- Other than forestry key areas of technical focus for Asia-Pacific are:
  - Water management
  - Climate planning and policy
  - DRR
  - Livestock management
  - Crop production

# Climate Change and agriculture

## *Hazards and Drivers*

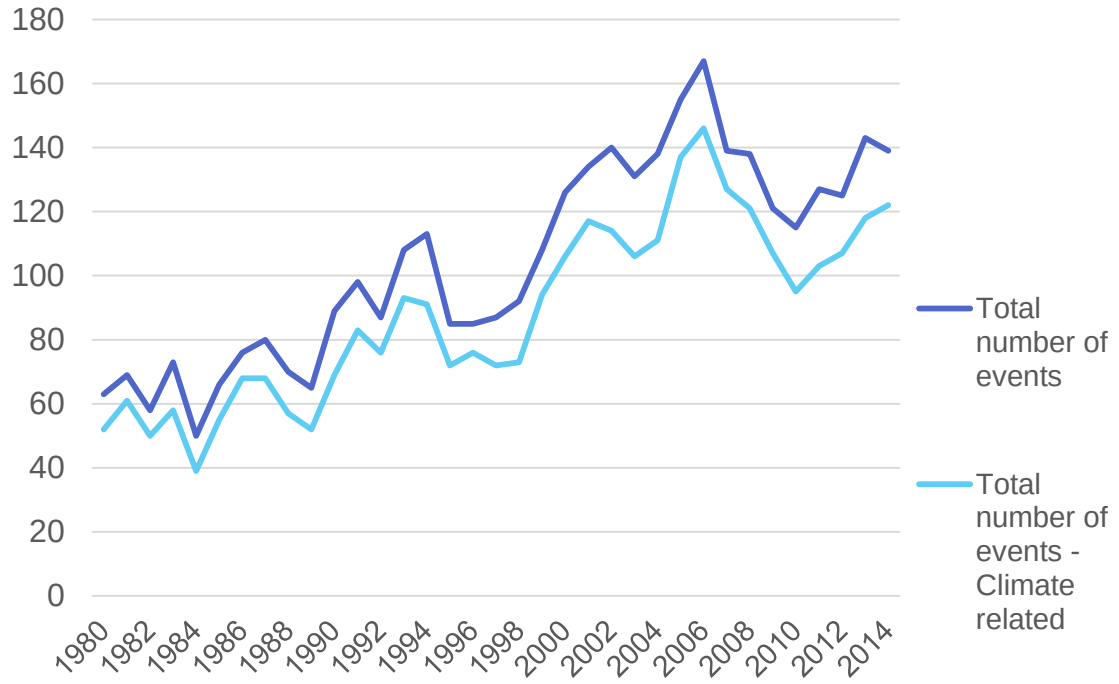



**Figure** - Number of disasters in Asia-Pacific by broad category, 1980-2014

*By total number of events and total number of climate related events*

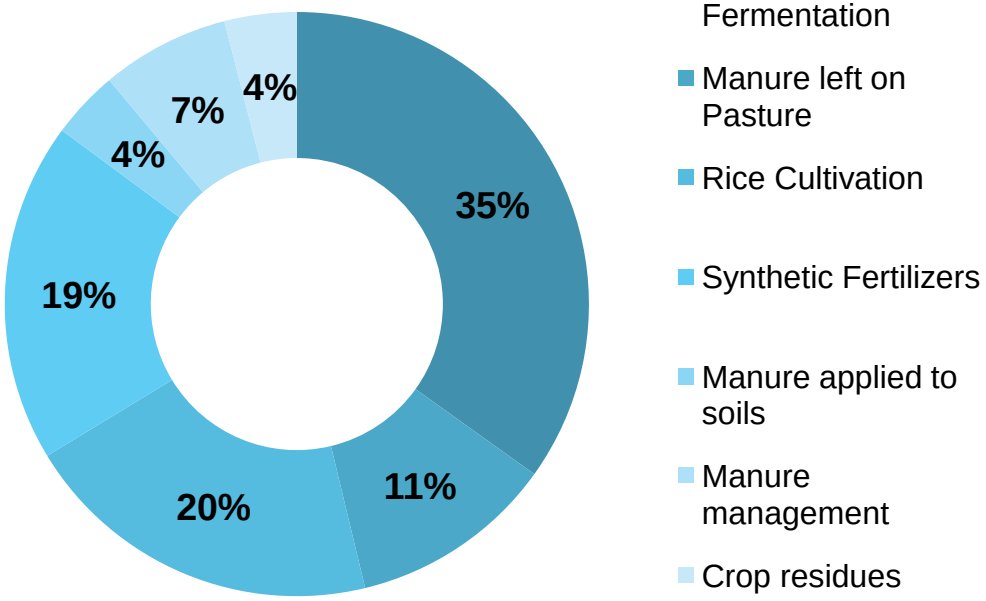


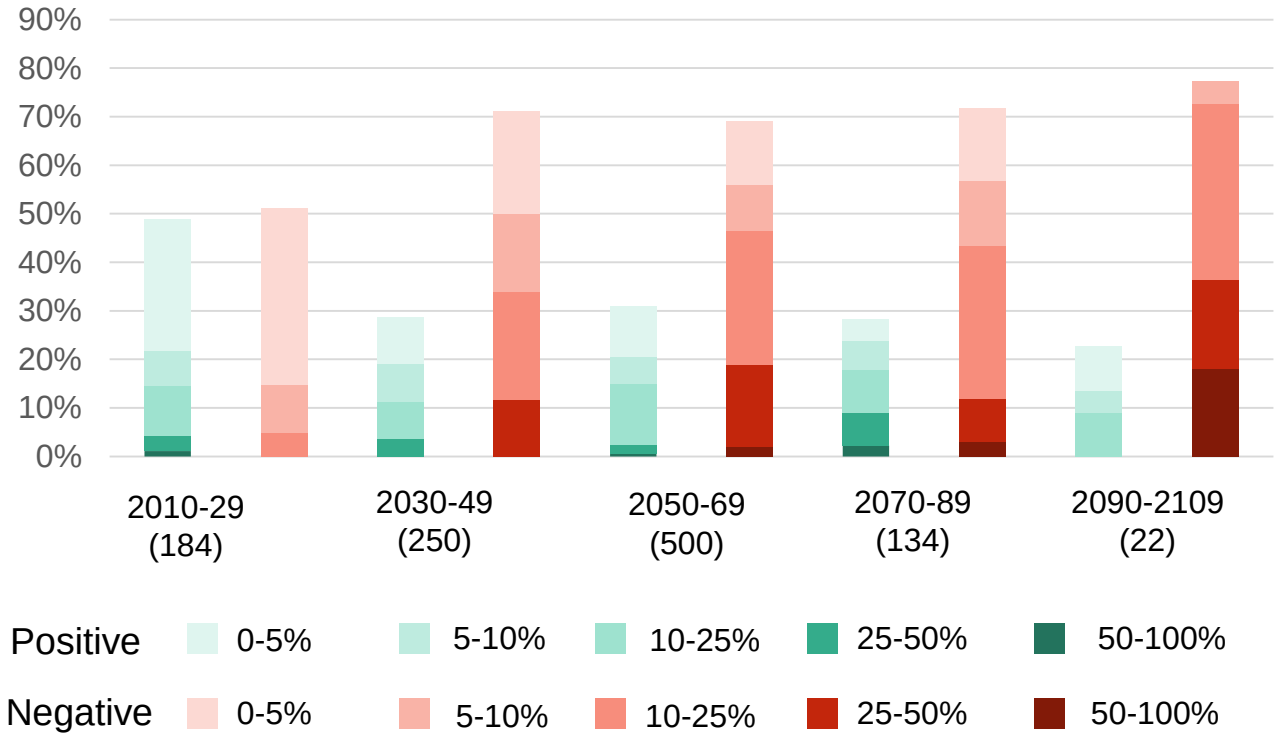

**Figure** - Shares of emissions from agriculture in Asia

*Percent based on average values, 2001-2011*

*Source*: Centre for Research on the Epidemiology of Disasters (CRED), 2016; FAOSTAT, 2015.

# Climate Change and Agriculture

*Impacts*




- **Projected impacts** of climate change on yield are significant
- **Smallholder agriculture** particularly **vulnerable** to climate change risks and impacts
- Rural **women** are among the **most vulnerable**

**Figure** - Projected changes in crop yields for all locations worldwide owning to climate change

*Percentage of yield projections (projections, n=1080)*

*Source*: FAO, 2016, State of Food and Agriculture.

# System Trends in Southeast Asia

*Agricultural production and post harvest*

*Source*: FAO & ITU, 2017

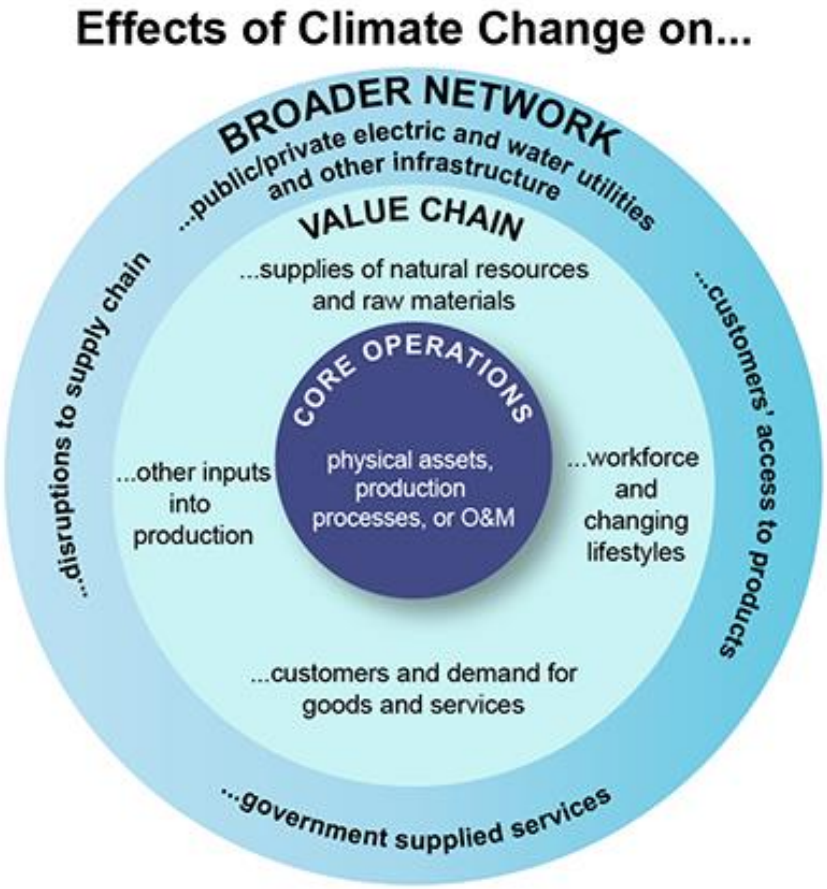
- **Mechanization** is **spreading rapidly** in a range of crops in nearly all countries in the region
- **Efficient farms** reduce negative environmental impacts
- Integration of **ICT** & other **technology** to enhance farm practices will lead to **improved monitoring** and **new business opportunities**
- New **institutions** will need to evolve that bring the latest technologies to small farms

# Value chain and climate risk

# Value chain and climate risk

Risks posed by climate change can affect business by

- Affecting core operations,
- Affecting the value chain,
- Setting up broader changes in the economy and infrastructure




*Source: C2ES, 2008; CC impacts in USA, 2014*

# Value chain and climate risk

- 1. Selection of the value chain
- 2. Identification of key climate risks in the value chain
- 3. Choice of the most effective climate interventions
- 4. Targeting those most vulnerable to climate risk
- 5. Reaching scale with climate interventions

*Source: Vermeulen, 2016*

But…

Focusing on the single value chain reduces intervention trade-off and might disregard territorial socio-economic and environmental characteristics

# Value chain and conservation

**Some aspects of conservation goes beyond value chain. For example…**

Farmers who invest in biodiversity conservation:

- often bear a disproportionally large share of the costs,
- while enjoying a much smaller share of the societal benefits.

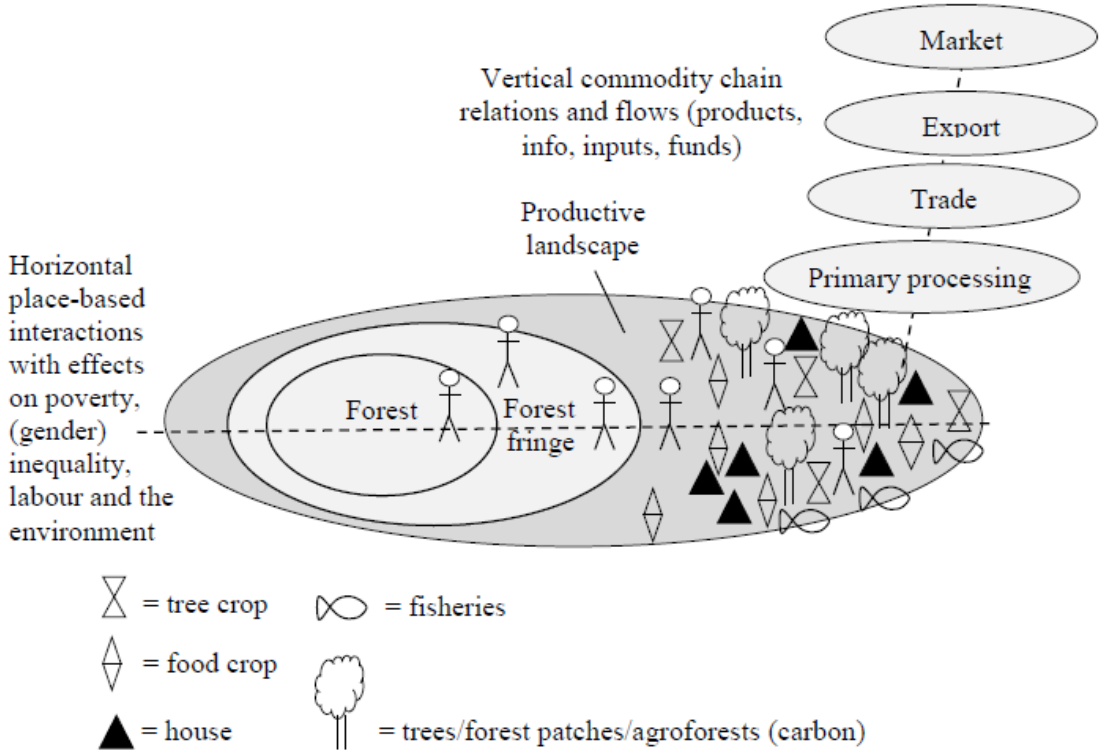
*Source: van der Horn, 2015*

# Climate smart landscapes for value chain resilience

# Value chain and the territory

i.e. Production of tables and chairs

**Value chain thinking**



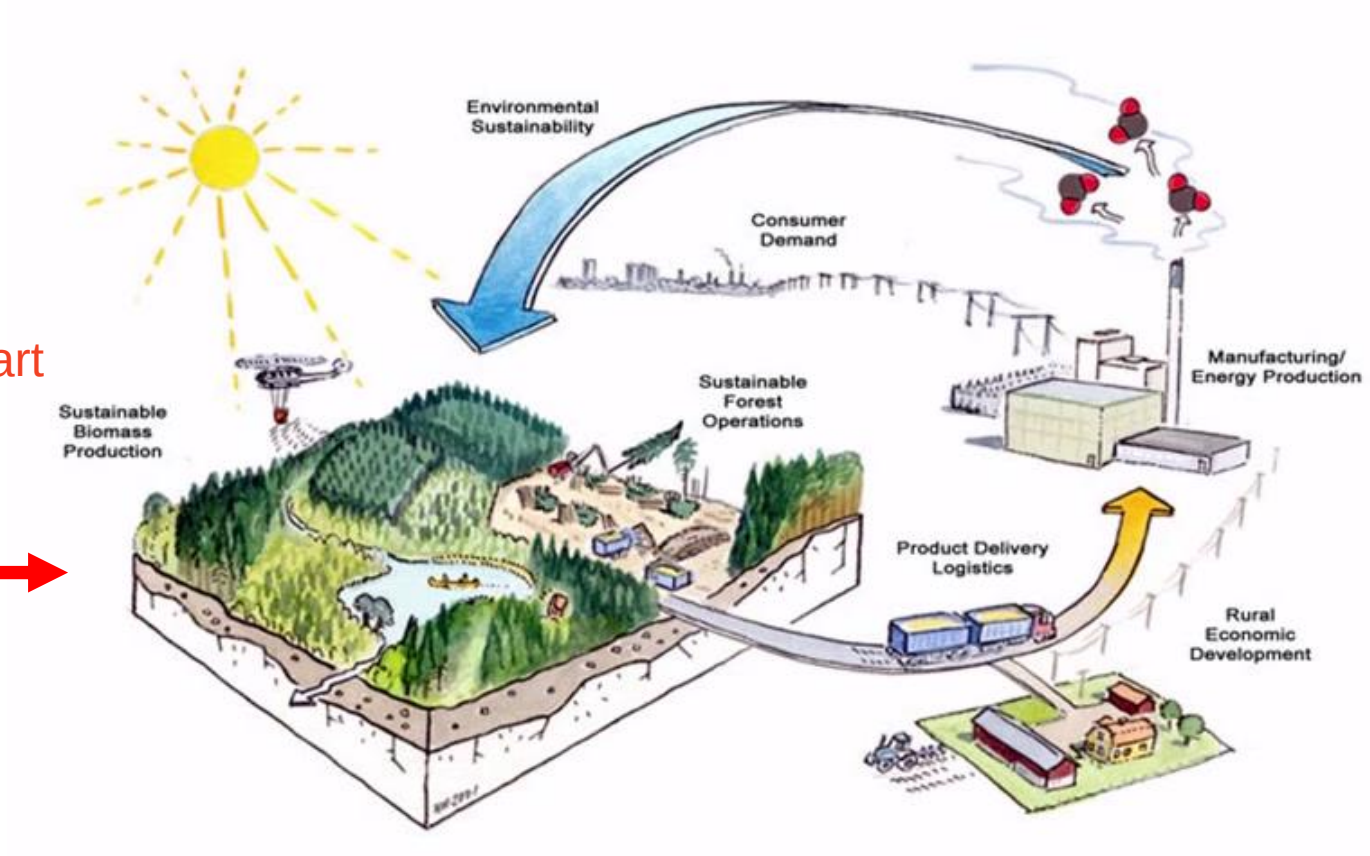

**Territorially embedded value chain collaborations**

*Source: Ros Tonen, 2015*

# …or landscape' multiple value chains

i.e. Production of tables and chairs

Value chain are part of landscapes




**Value chain thinking**

**Landscape thinking**

*Source: van Oosten, 2015*

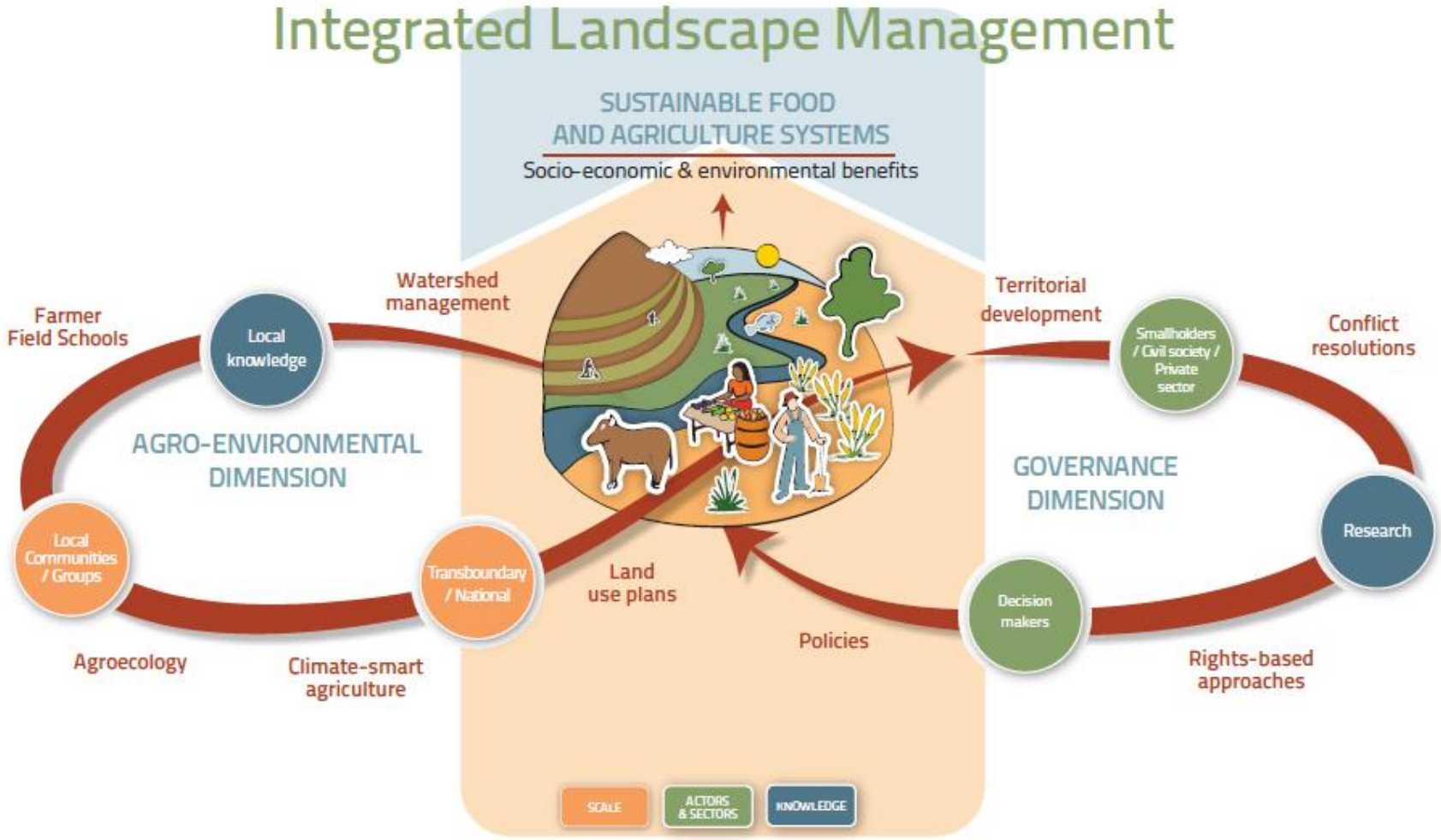
# Landscape thinking

- integrates the different elements of a landscape
- addresses potential trade-offs between production and conservation
- gives ability to upscale success

ADB, 2017

Photo: Mukesh Khugsal

*Source: van Oosten, 2015*

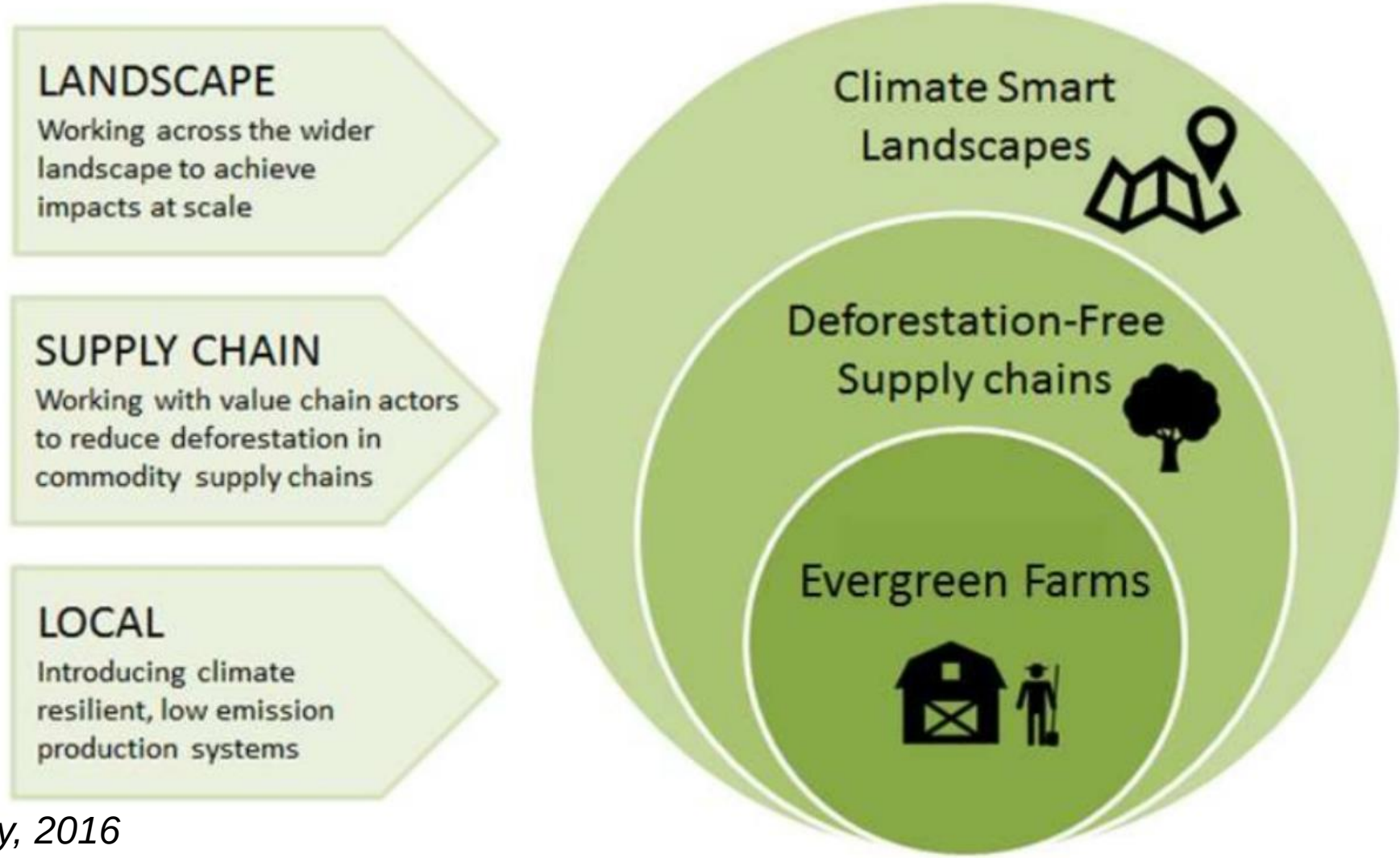



- ILM is multisectoral, multistakeholder and multi-scale;
- focuses on agro-environmental and governance interactions;
- applies rights-based principles and considers short and long term perspectives.

*Source: Petri and Bunning, 2017, under preparation*

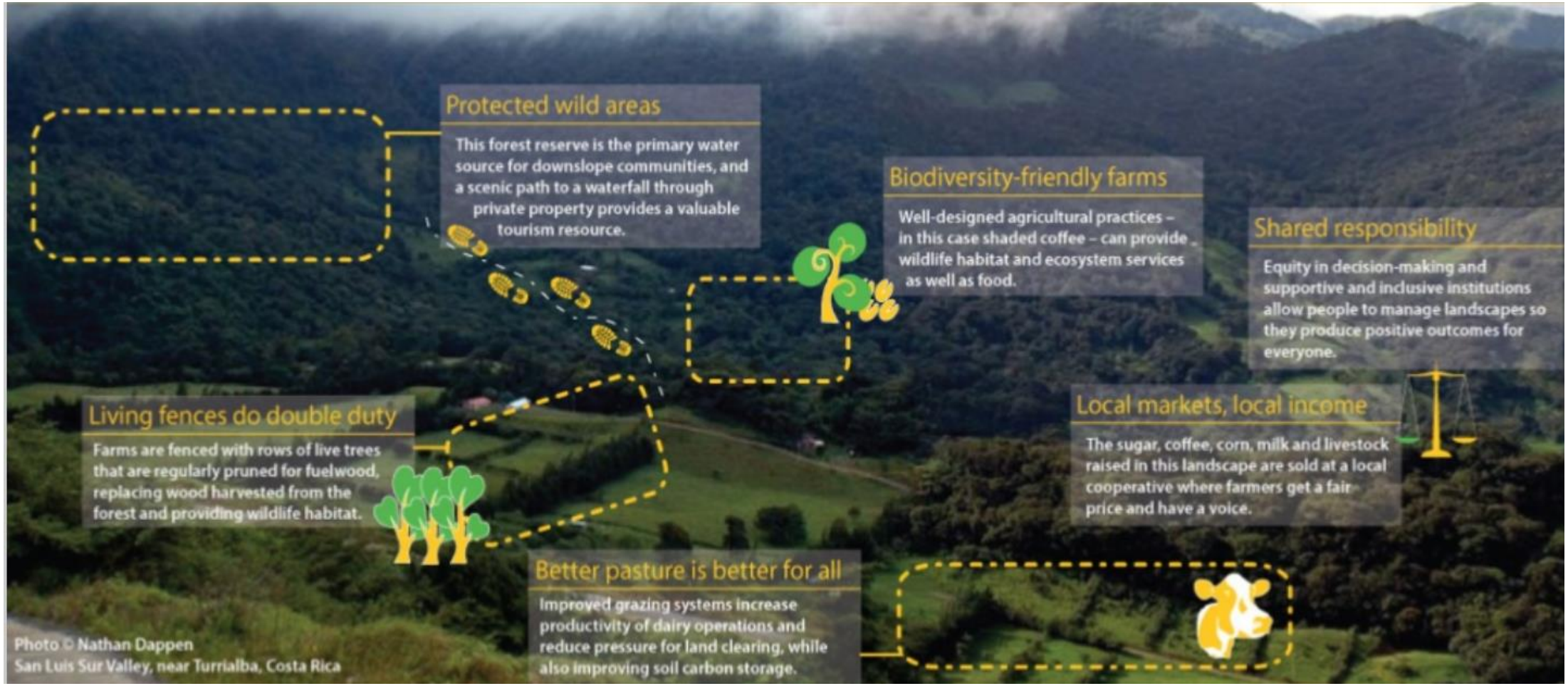
# Climate smart landscapes

Multiple level interventions where consumer has a say in production systems




*Source: McNally, 2016*

# Climate smart landscapes

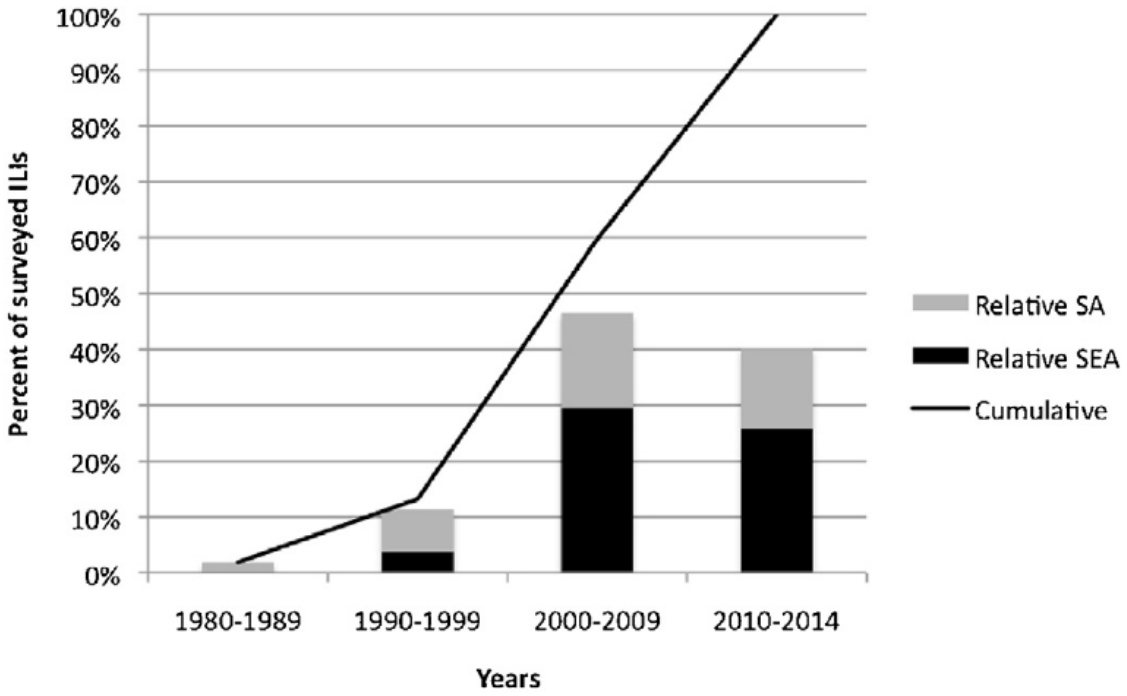



*Source: LPFN, 2015*

Example in forest areas

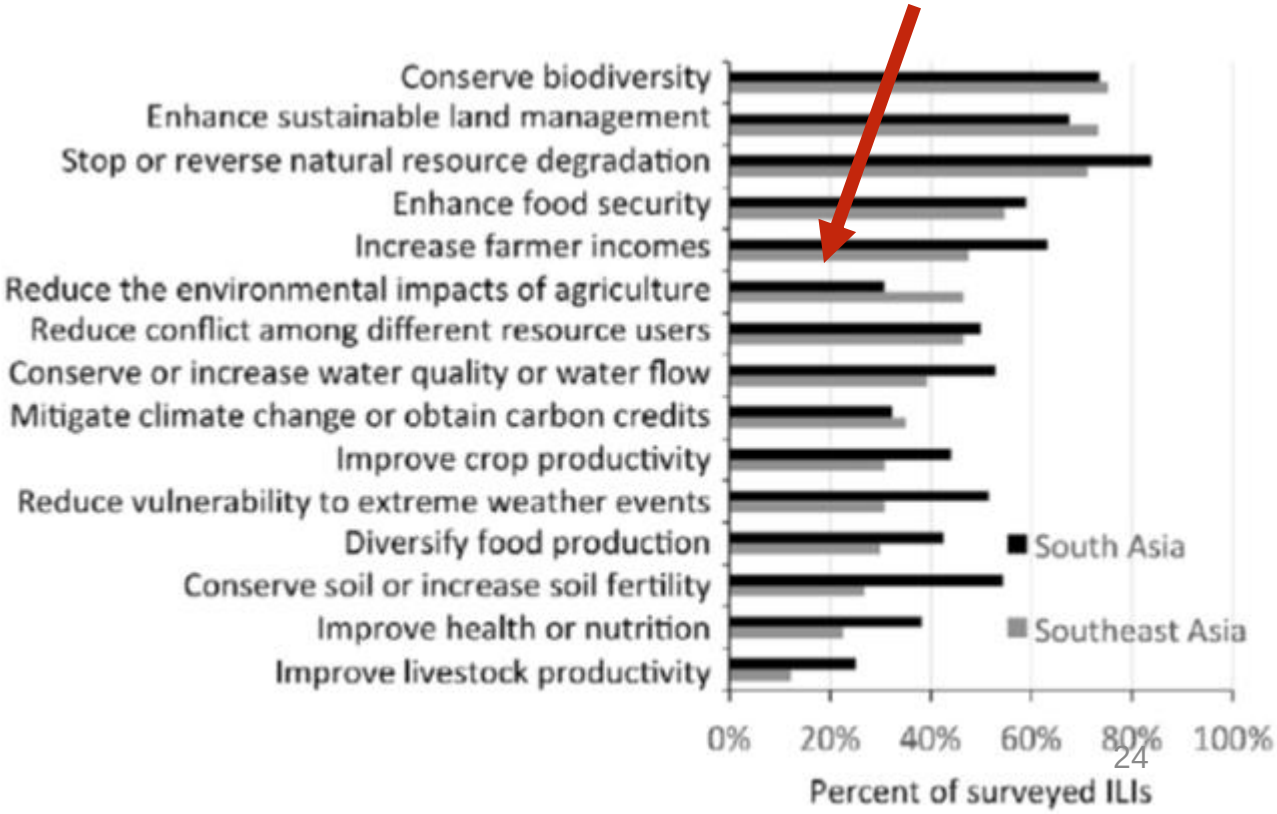
# Landscape initiatives working at multiple value chain levels in Asia

# Integrated landscape initiatives in Asia




Landscape initiatives are growing

Many are:
-relevant to adaptation/mitigation
-dealing with resilience
-dealing with value chains




*Source: Zanzanaini, 2017*

# FAO composting urban food waste into agriculture inputs in Sri Lanka

- Reduced waste health risks
- Organic fertilizers, healthy soils → climate resilience + mitigation
- New jobs
- Extra income to the municipality - instead of a cost


Source: Climate smart agriculture Sourcebook, 2017 (under preparation)

# Conservation agriculture in Timor Leste

Increase of yields and production

Less fertilizer use (-50%), less pesticides

Less machinery and labour cost (-70%)

Higher profits

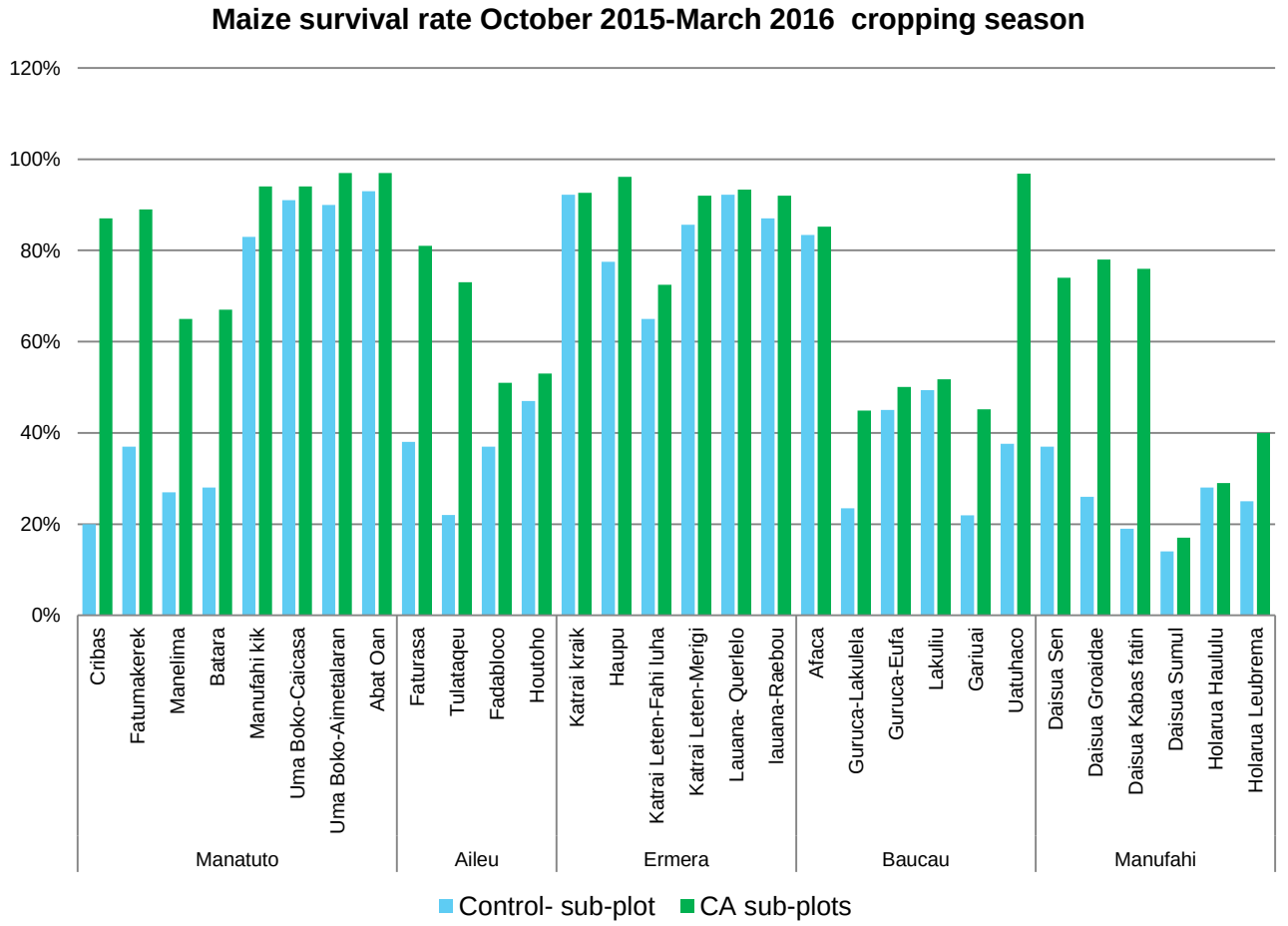
Lower need for infrastructure - water

More tolerant to climate extremes - drought, floods, temperature

Source: USAID. 2015. Enhancing Food and Nutrition Security and Reducing Disaster Risk through the Promotion of Conservation Agriculture in Timor Leste

# Conservation agriculture in Timor Leste

**CA** vs non-CA



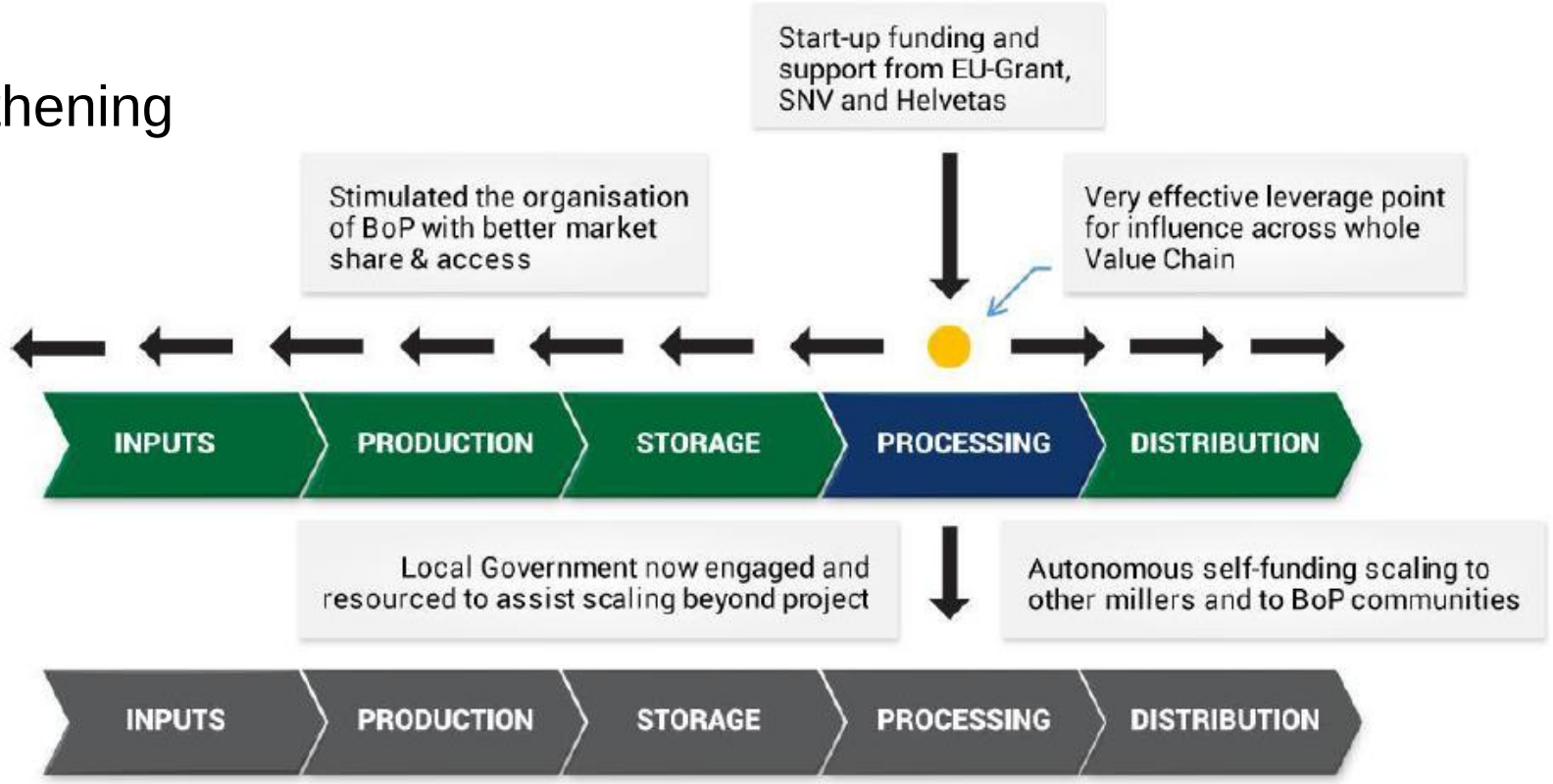
# From one value chain to landscape inclusive development in Lao PDR

Rice millers lead systemic inclusive change including smallholder groups through extension system strengthening

Better trade negotiations and better revenues for millers and producers

Integration with government helped reducing taxes

Good practice is now replicated in other VCs




Source: ASEAN Climate Resilience Network, 2015

# FAO experience scaling-up system of rice intensification in Vietnam

Specific Sustainable Rice Intensification management practices **delivered** through **farmer field schools**

Practices adopted:

- **Reduced inputs** including seed, pesticides and fertilizer
- **Increased productivity**
- **Increased** farmer **return** on investment
- **Reduced emissions**

Programme led to adoption by **1.5 million farmers**

**Investments** (modernized irrigation systems, land levelling and trained labor)

**Technical assistance** (training, inputs and engagement with government & private agri-business)

Source: FAO. 2014. Regional Rice Initiative.

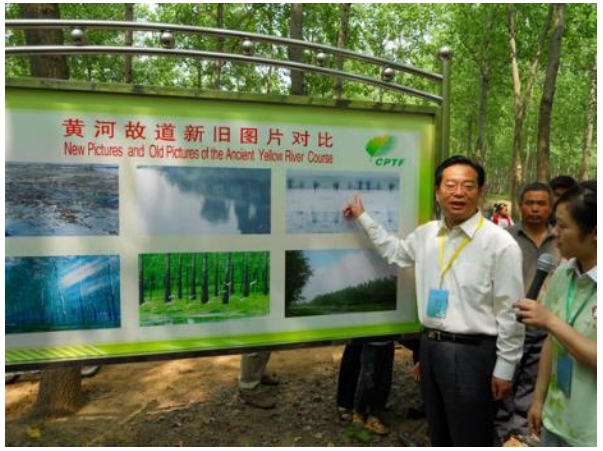
# Ecosystem services by various rice systems in Asia

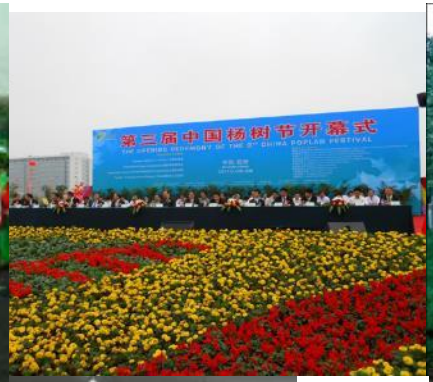
| ECOSYSTEM SERVICES | Conservation agriculture | Integrated Farming System | Organic agriculture | Holistic heritage agriculture | System of rice intensification (SRI) | Integrated pest management (IPM) |
|---|---|---|---|---|---|---|
| Diet diversity | ● | ● | ● | ● | | |
| Carbon sequestration | ● | ● | ● | ● | | |
| Cultural services | | ● | | ● | | |
| Energy provision | | ● | | | | |
| Genetic diversity | | | ● | ● | | |
| Mitigation of GHGs | ● | ● | ● | ● | | ● |
| Pest control | | ● | ● | ● | ● | ● |
| Soil structure, fertility, erosion control | ● | ● | ● | ● | ● | ● |
| Resilience to climate disturbance | | | | ● | ● | |
| Water quality | ● | ● | | ● | ● | |
| Water quantity | ● | | | ● | ● | ● |
| Weed control | | ● | ● | ● | ● | |
| Wild biodiversity & habitat provisioning | | | ● | ● | | |

Source: FAO. 2014. Regional Rice Initiative.

# Poplar value chain benefitting millions in Siyang - China

- Agroforestry, watershed management
- Stabilize riverbanks, mitigate soil erosion and sandstorm
- Improve wildlife
- Recreation
- Wood value chain, industry
- Poplar Museum




*Source: Del Lungo, 2010*

# FAO, Reducing post harvest losses along the rice supply chain in Myanmar

- FFS, community and local institutions involvement

- Reduced post harvest losses
- Reduced health risks from contamination of rice
- Use of climate resilient drying and storage technologies
- Increase income

Flat-bed dryer powered by rice husk furnace

Solar bubble dryer (IRRI)

Double layered hermetic bags

# Conclusions

# Observations

- Southeast Asia faces a **significant climate challenge** for agriculture and food security
- **Responding** to climate change **risks** in agriculture **requires** an **understanding** of the broader **system** (agro-environment + governance)
- **Scaling up** existing successes requires **realistic information** and good **governance**

# Conclusions - Focus on value chains with landscape vision

- Understanding and **assessing** climate risks and drivers with sound science and through stakeholders involvement
- **Governance**. Competent institutions able to address climate change and enforce suitable policies
- Multiple functions at multiple spatial and temporal scales produce **multiple benefits** through multiple value chains
- Implementing viable climate-smart options for farmers, business and policy makers depends in the **negotiation of risks and synergies**

# FAO publication under preparation

- **Landscape for life** –
  FAO guidelines for landscape management and ecosystem services provisions
- Updated **FAO CSA Sourcebook** –
  landscape approach as the hub for managing natural resources and sustainable and biodiverse land use and production systems

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# Thank You