Agroecological Transition of Food Systems in Africa

Keynote:
Scientific evidence for agroecological and organic transition in Africa

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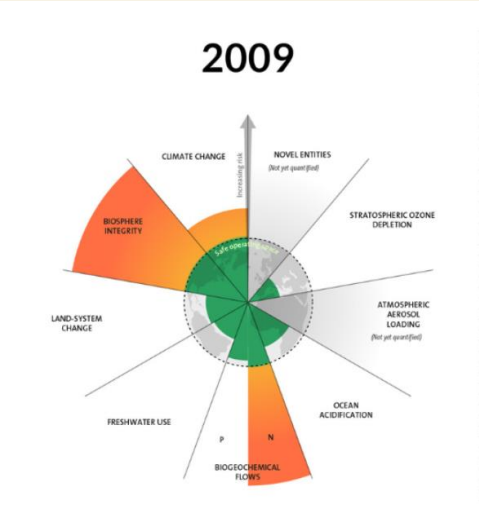
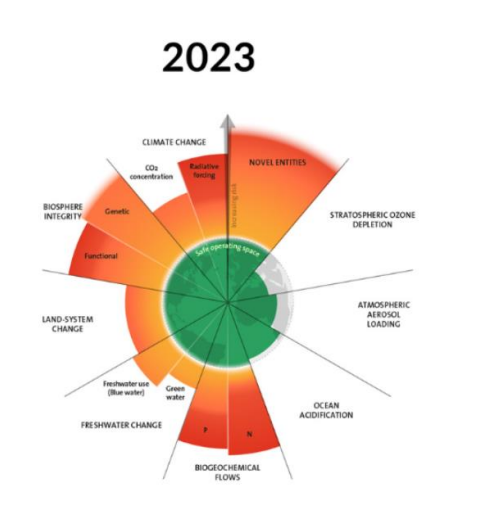
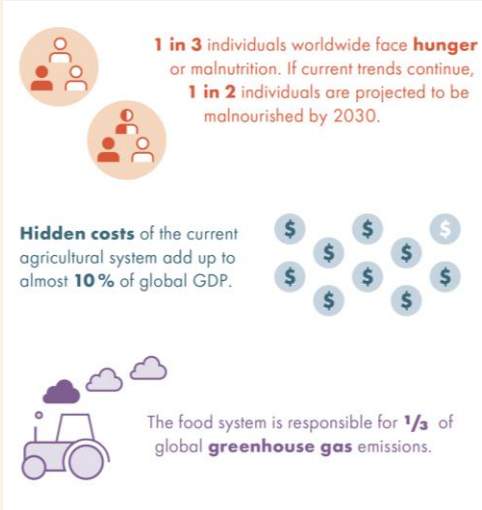
Why Agroecology and Organic (AE&O)?







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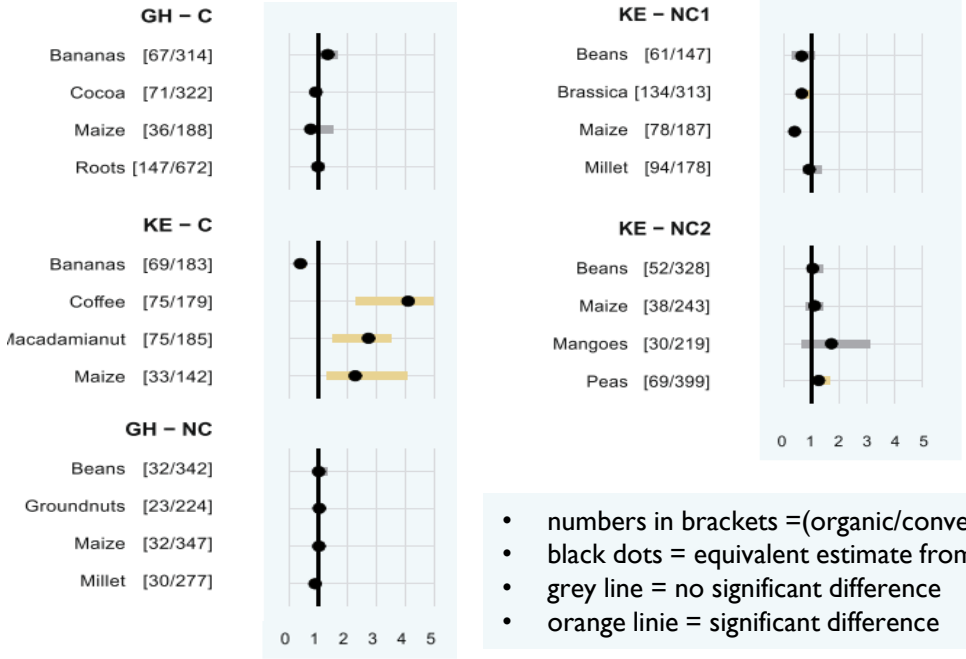
Case study: Comparative yield outcomes in organic and conventional systems

- On-farm data over 5 seasons: Yield equivalents in selected crops in Ghana (GH) & Kenya (KE)
- In 4 out 5 cases, the yields of organic systems were the same as conventional
- One organic certified site in Kenya had higher yields from coffee, macadamia and maize than their conventional counterparts



- numbers in brackets =(organic/conventional)
- black dots = equivalent estimate from study
- grey line = no significant difference
- orange linie = significant difference

Source : Schader et al. (2021)

ProEco Africa

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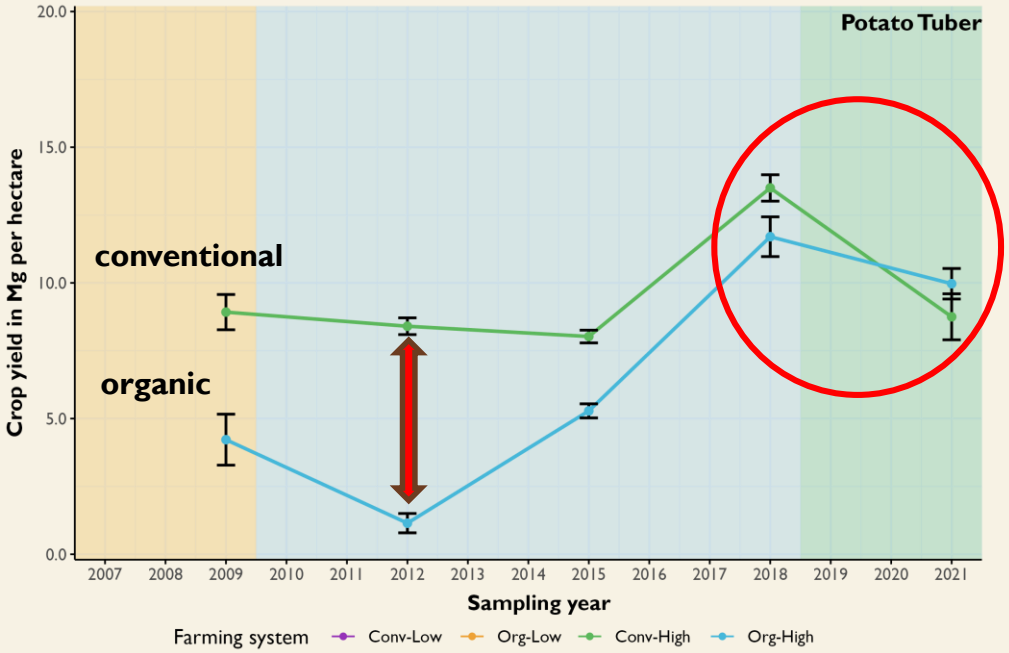
Case study: Potatoes from Kenya - higher yields due to active AE&O management

Comparable yields achieved through active organic management:

- **Push-Pull** (intercropping with functional plants, attracting beneficial repelling pests)
- **Adapted varieties**
- More effective self-made **biopesticides** than available on the market (e.g. plant extracts)
- **Improved composting**

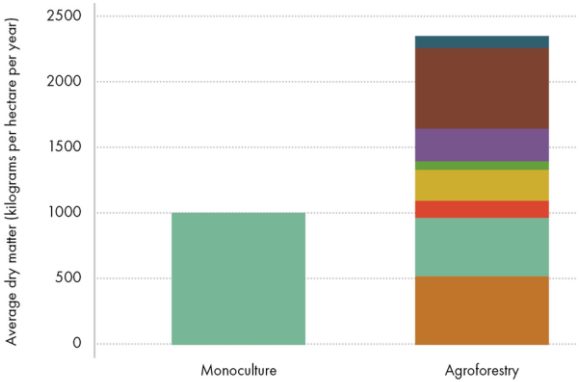


SysCom

Case study: Diversified systems attain higher productivity and resilience

Total yields over time in cocoa agroforestry systems were more than double of cocoa monocultures

2013-2022



Curcuma
Coffee
Other fruit trees
Peach palm
Cocoa
Banana
Maize
Ginger

Sources: : Bhullar et al. (2021), FiBL (2023), Sekaran et al. (2021)

Productivity

- AE&O follow **systemic management approaches** and can reach **equivalent productivity** as conventional. Yield gaps in the tropics might be over-estimated.

- The **focus should extend beyond the «yield gap»** to include:
  - sustainable value chains
  - landscape level effects

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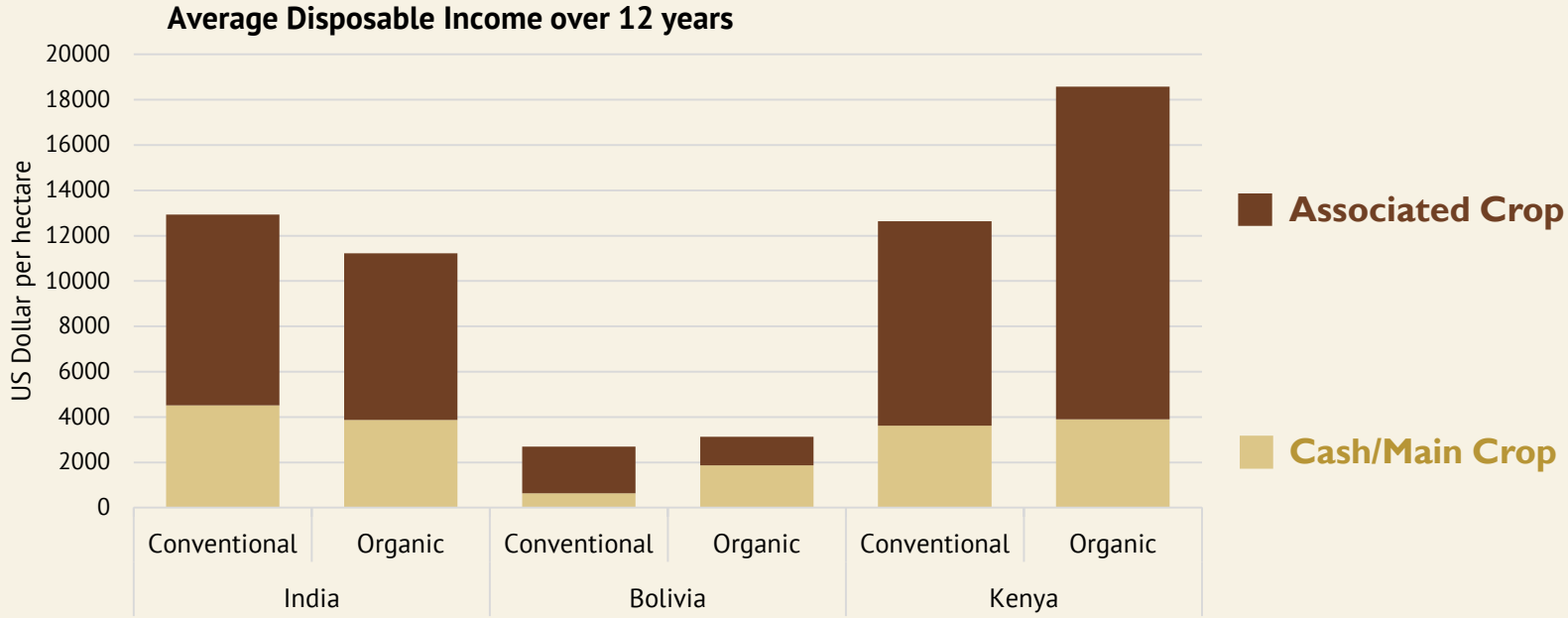
Case studies: Impact of non-export oriented associated crops on available income has been under estimated



SysCom

Source: Riar et al. (2024): «Farm gate profitability of organic and conventional farming systems in the tropics»

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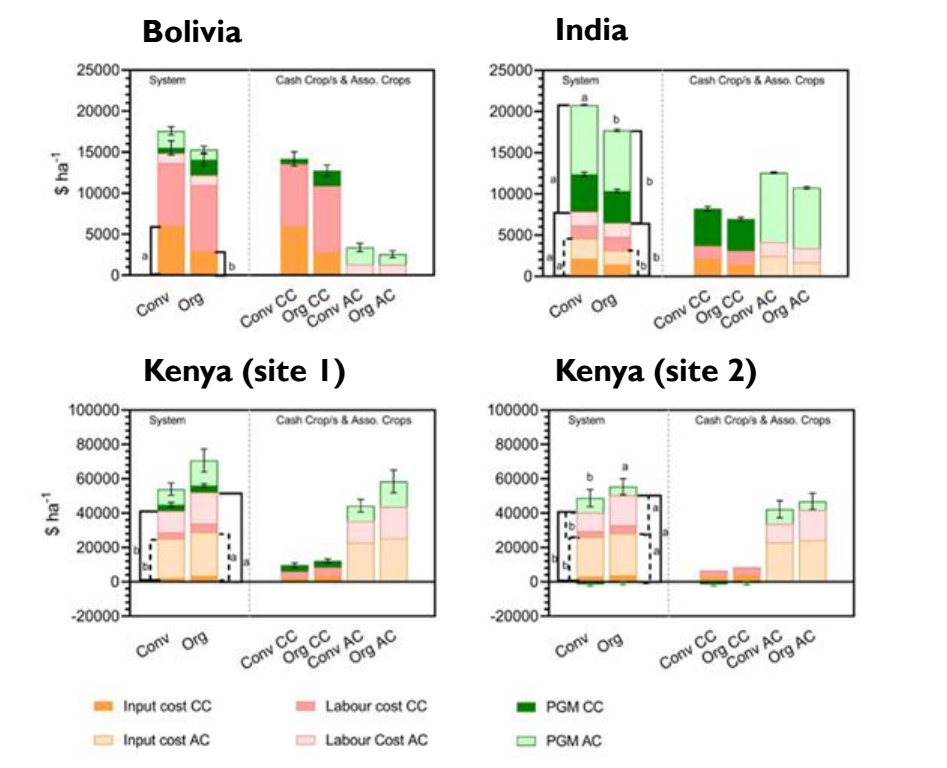
Case studies: Profitability in diversified organic systems in the tropics is comparable to conventional systems

The economic viability of organic systems goes beyond main crops, **with associated, sequential, and rotational crops playing a significant role** in overall farm profitability

Positive effects also observed in marginal locations



SysCom

Source: Riar et al. (2024): «Farm gate profitability of organic and conventional farming systems in the tropics»

Profitability

- AE&O can **increase income and resilience** of smallholder farmer' livelihoods, especially in diversified systems and with **premium prices** for cash crops

- **Negative external effects and costs are reduced**, adding resilience against insecurity from climate change

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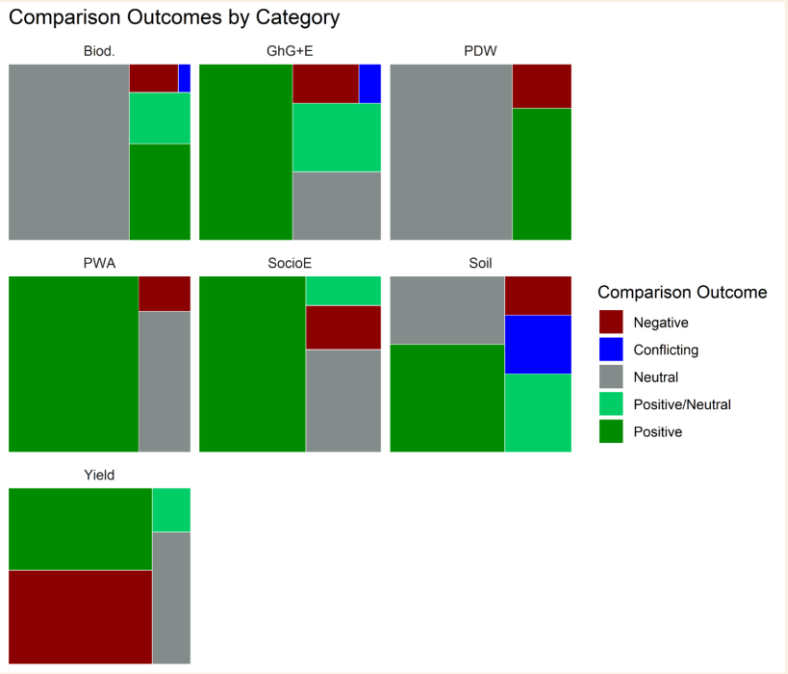
Beneficial environmental impacts of organic agroforestry in comparison

Organic agroforestry improves a considerable array of biophysical and socio-ecological factors (such as pollution, nutrient leaching and nutrient mineralization) when directly comparing it to alternative systems.

Reported effects:

- Biodiversity (neutral/positive)
- GHG emmission + energy (p/n)
- Pests, disease, weeds (p/n)
- Pollution (p)
- Socioeconomic factors (p/n)
- Soil (p/n)

Mixed results on yield, as study focus was on single crop yields, not system yields or profitability



Source: Willmott et al. (2024)

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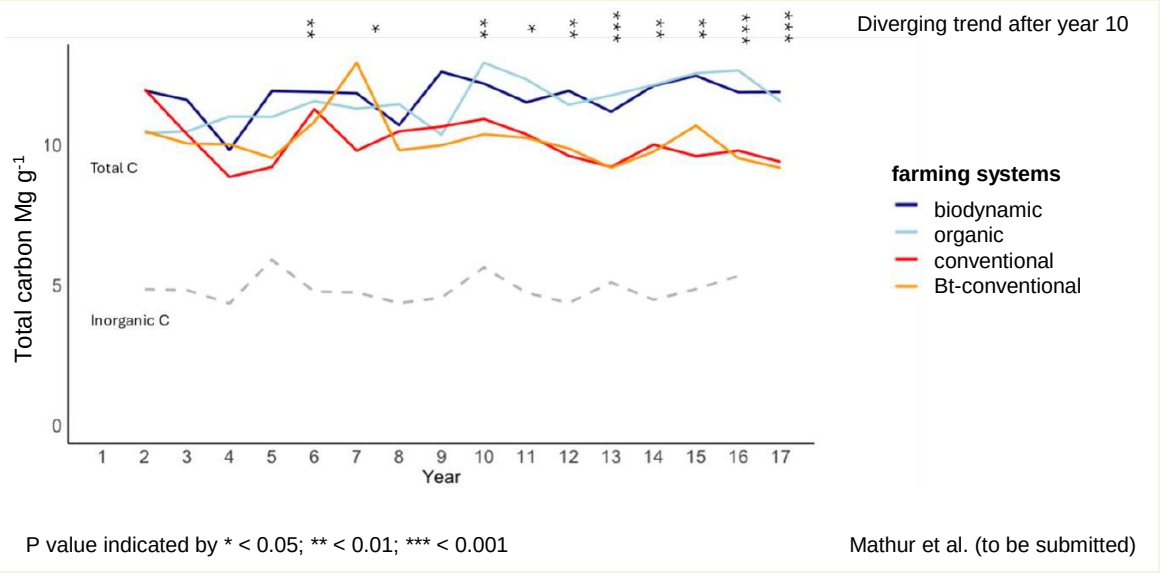
Case studies: Improvement of soil fertility through soil organic carbon built up



P value indicated by * < 0.05; ** < 0.01; *** < 0.001

Mathur et al. (to be submitted)

AE/O practices have the potential to enhance organic carbon content by sequestering more carbon in soil, plants, and trees compared to conventional systems.

SysCom India

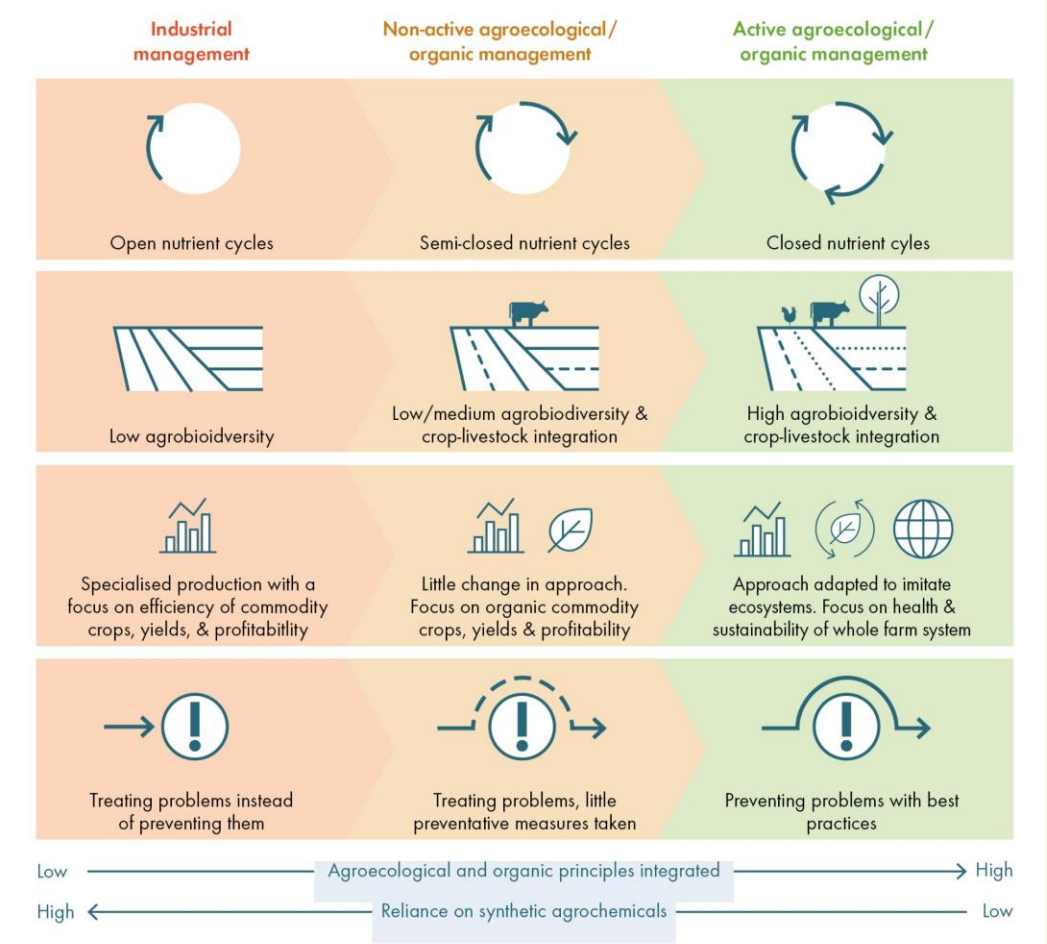
Environmental factors

- **AE/O helps to**
  - Adapt to climate change
  - solve the crisis in biodiversity,
  - improve soil health
  - Reduce GHG emissions and increase soil organic carbon content

AE&O is more than just reducing external inputs and diversification

Systemic approaches are essential to reach the full potential of AE&O

- contribute to higher yields, closing yield gaps
- increase agrobiodiversity and soil health



This figure focuses on production level and is inspired by: Schader et al. (2021) & Altieri et al. (2011)

Opportunities to facilitate sustainable food systems

Economic

- True-cost accounting
- Long-term-funding
- Value chain and market development to support fair pricing

Knowledge

- Bolster knowledge and capacity development, i.e. strengthen farmer organisations and extension services
- Support education, research, knowledge co-creation and exchange

Social

- Improve consumer food literacy
- Empower farmers and supply-chain actors through knowledge and resources

Resources

- Discontinue financial support and subsidies for harmful agricultural practices
- Support for appropriate mechanisation and digitalisation
- Land tenure reform

Governance

- Smart policies to incentivise and support transition to agroecology and organic

Agroecology and Organic Agriculture in the Tropics

… can sustain a growing population

… are profitable and affordable

… are scalable

Sources: 88 scientific peer-reviewed publication and 61 publications and international studies (e.g., FAO, CFS-HLPE, IFAD IPES Food)

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Thank you

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