

Agroecological systems for climate mitigation and adaptation and biodiversity conservation

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20th century agriculture works against nature

Industrial/conventional agriculture is based on:

- Uniformity/simplification
- Economies of scale/specialisation
- Chemistry:
 - Feeding plants directly with chemical fertilizers
 - Protecting plants with pesticides

→ Land degradation: loss of carbon in soils and loss of biodiversity and destruction of life in the soil

Unsustainable food systems

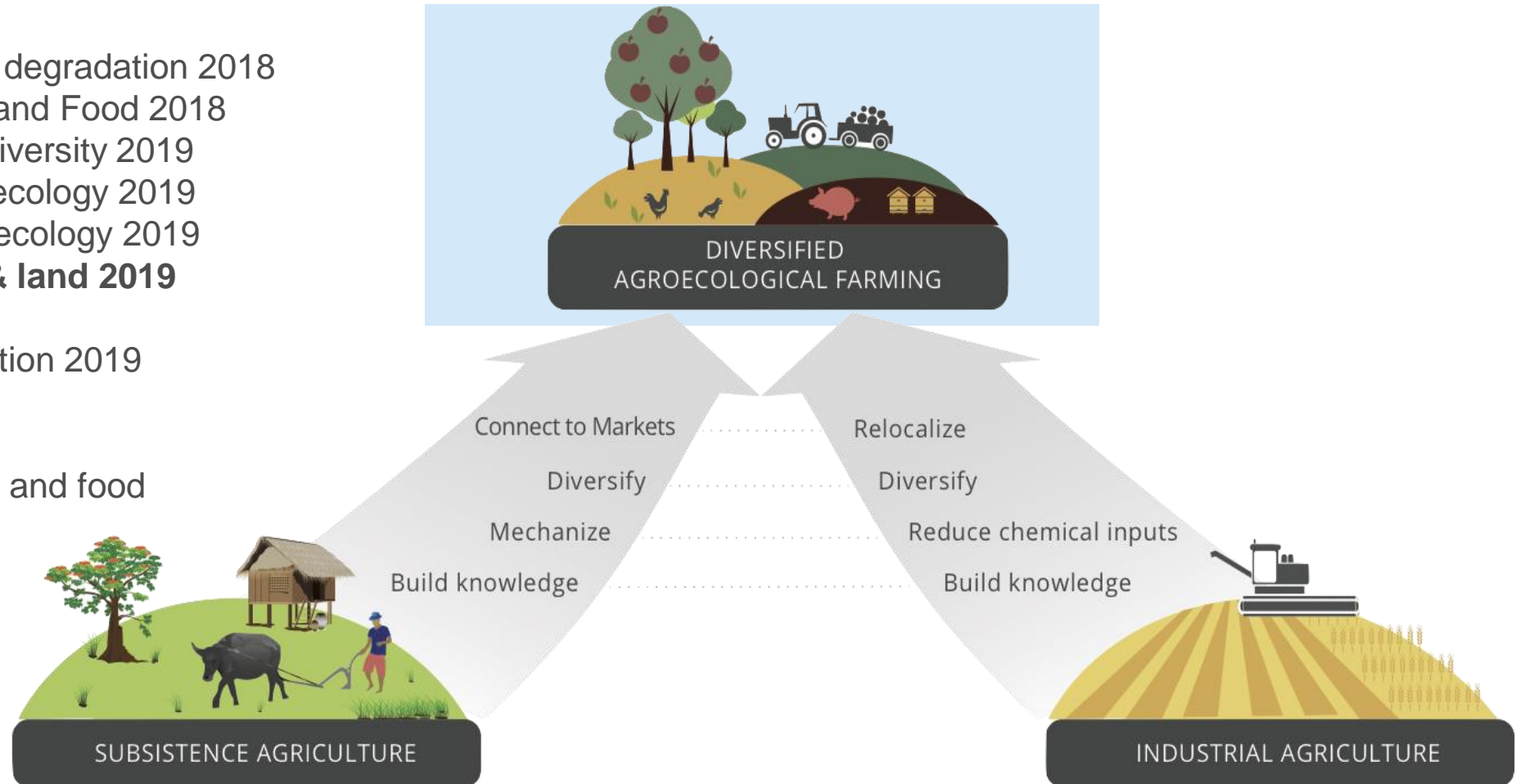
Food systems produce about **1/3 of GHGs with agriculture, forestry & land-use sectors account for nearly a quarter (24%)**.
In addition: Pollution,, malnutrition, inequity ...

Current **food systems are vulnerable to climate change** and need to adapt.

Agriculture is responsible for 80% of biodiversity losses:
simplification of agricultural landscapes and deforestation.

We need transformational change

IPBES report on land degradation 2018
TEEB for Agriculture and Food 2018
IPBES report on Biodiversity 2019
HLPE report on Agroecology 2019
IDDRI report on Agroecology 2019
IPCC report on CC & land 2019
GSDR 2019
Global comm. adaptation 2019
GBO-5 2020
HLPE 2020 report
Mission on soil health and food



A different paradigm: diversified resilient and sustainable systems

A holistic, integrated approach to simultaneously reach:

- Economic
- **Environmental**
- **Climate M & A**
- Health
- Social
- Cultural objectives



A different paradigm

- It is not about promoting a set of agricultural practices, or innovations among others such as climate smart agriculture, nutrition sensitive agriculture, precision agriculture, sustainable intensification ...
- Diversified agroecological systems are knowledge intensive and **take the best of all innovations** that are compatible with the 10 elements of agroecology, combined with traditional and farmer knowledge through co-innovation to develop locally adapted sustainable solutions
- It is also about changing social relations, empowering farmers, adding value locally and privileging short value chains that link consumers and producers



Environmental/climate outcomes of diversified agroecological systems

- Keep/**put carbon in the soil** - turns agriculture into a solution rather than a problem
- Boost biodiversity
- **Restore degraded land**
- Improve ecosystem services
 - Water and nutrient cycling
 - Pollination
 - Pest and disease management

Agroecology for adaptation

“Adoption of agroecological practices could provide resilience for future shocks, spread farmer risk and mitigate the impact of droughts”

- “In summary, increasing the resilience of the food system through agroecology and diversification is an effective way to achieve climate change adaptation (*robust evidence, high agreement*).”
- IPCC, 2019: Special Report on Climate Change and Land (SRCCL), Ch5 p51

FAO and Biovision report on “The potential of agroecology to build climate-resilient livelihoods and food systems”

<http://www.fao.org/documents/card/en/c/cb0438en>



Report of the Global Commission on Adaptation:

“Soil erosion and losses of soil carbon, among other threats to soil quality ... can potentially be addressed with agroecological approaches”

“Governments to adopt measures to conserve land and water resources at the landscape scale, including agroecological approaches”

“Support expanded access to and use of adaptive technologies and agroecological practices that build resilience of farms and ecosystems”



Agroecology for climate mitigation

IPPC: “Biological approaches to carbon capture are the most promising prospects for negative emissions”

- Protect current forests
- Restore degraded lands
- Increase tree cover on agricultural lands through agroforestry
- Increase the biomass production of pasturelands

→ **This can be achieved through agroecology**

Adaptation and mitigation

- Many tropical agricultural systems can provide both mitigation and adaptation benefits if they are designed and managed appropriately (Harvey et al., 2013)

Potential of agroforestry

- The current global annual increase in tree biomass is now over 0.74 billion tons CO₂ equivalents.
- Generalising of agroforestry to:
 - double the annual accumulation of carbon through agroforestry by 2035 to 1.5 billion tons/yr
 - increase it to a rate of 3 billion tons by 2050
- Agroforestry could then more than offset all other
- Agricultural GHG emissions



Farmer-Managed Natural Regeneration of trees is being massively upscaled on the croplands in Niger & Mali & Senegal

Gliricidia shrubs intercropping in crop production





Agricultural soils as a sink: the 4 per 1000 initiative

Global soils contain 2 to 3 times more carbon than the atmosphere.

“If this carbon level increased by 0.4%, or 4 ‰ per year, in the first 30-40 cm of soil, the annual increase of carbon dioxide (CO₂) in the atmosphere would be significantly reduced”

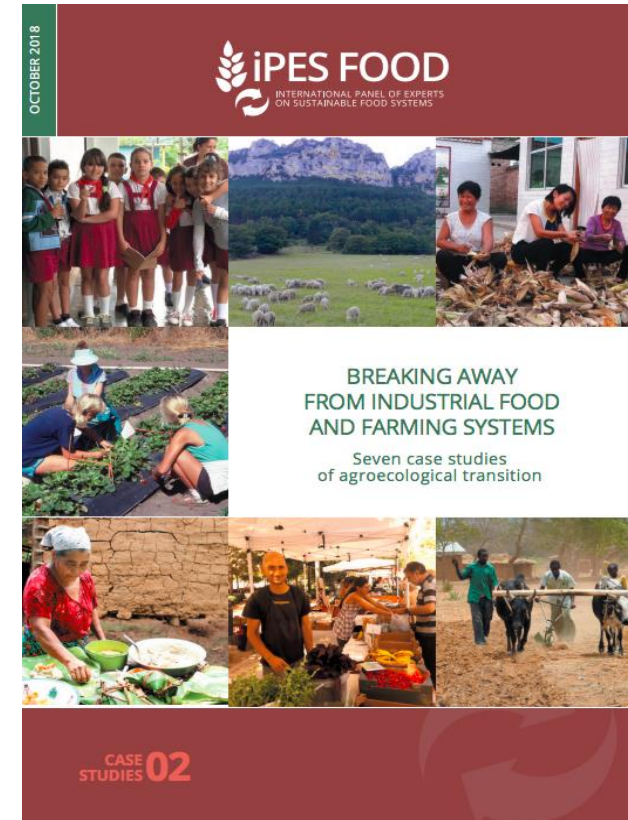
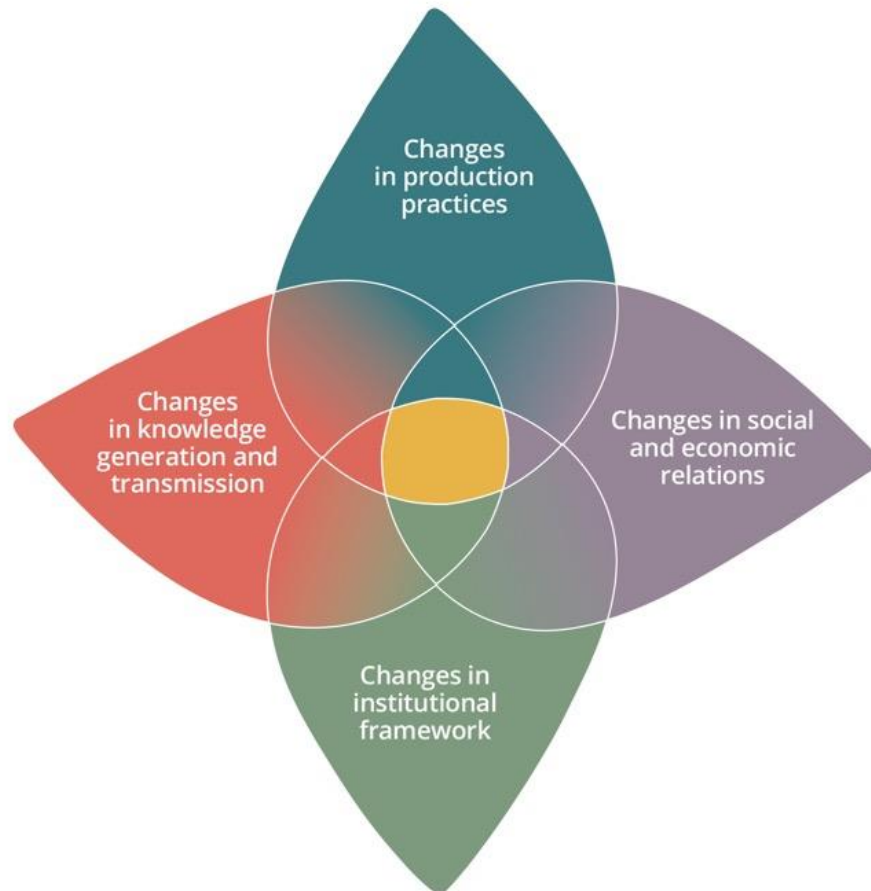
“Encourage **agro-ecological** practices that increase the quantity of organic matter in soils”

(4 per 1000" Initiative at COP 21)

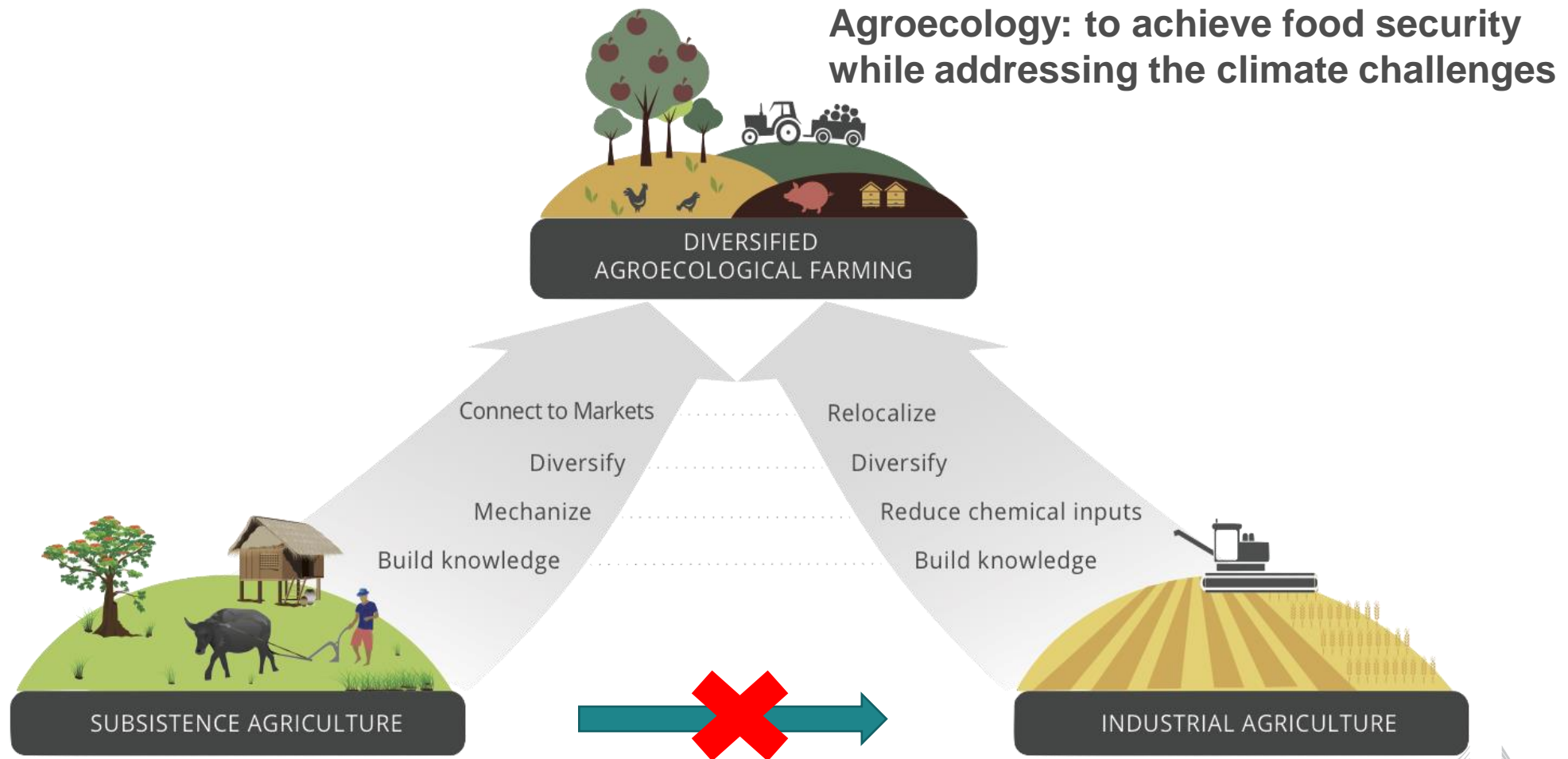
Supporting the transition

- Support farmers during the conversion
- True cost accounting: tax unsustainable practices and subsidize sustainable practices
- Facilitate access to land for young farmers starting sustainable diversified agroecological farming
- Support short value chains linking consumers and producers

The transition is already underway...



Different pathways, common goal



Thank you!



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