



Diversified Resilient Agricultural systems for climate mitigation and adaptation ... and much more

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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, biodiversity loss, malnutrition, inequity ...

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

But agriculture and food systems have the capacity to adapt to – and mitigate climate change through diversified resilient and sustainable systems

20th century agriculture

Industrial/conventional agriculture is based on:

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

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

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

IDDR 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



Connect to Markets

Relocalize

Diversify

Diversify

Mechanize

Reduce chemical inputs

Build knowledge

Build knowledge

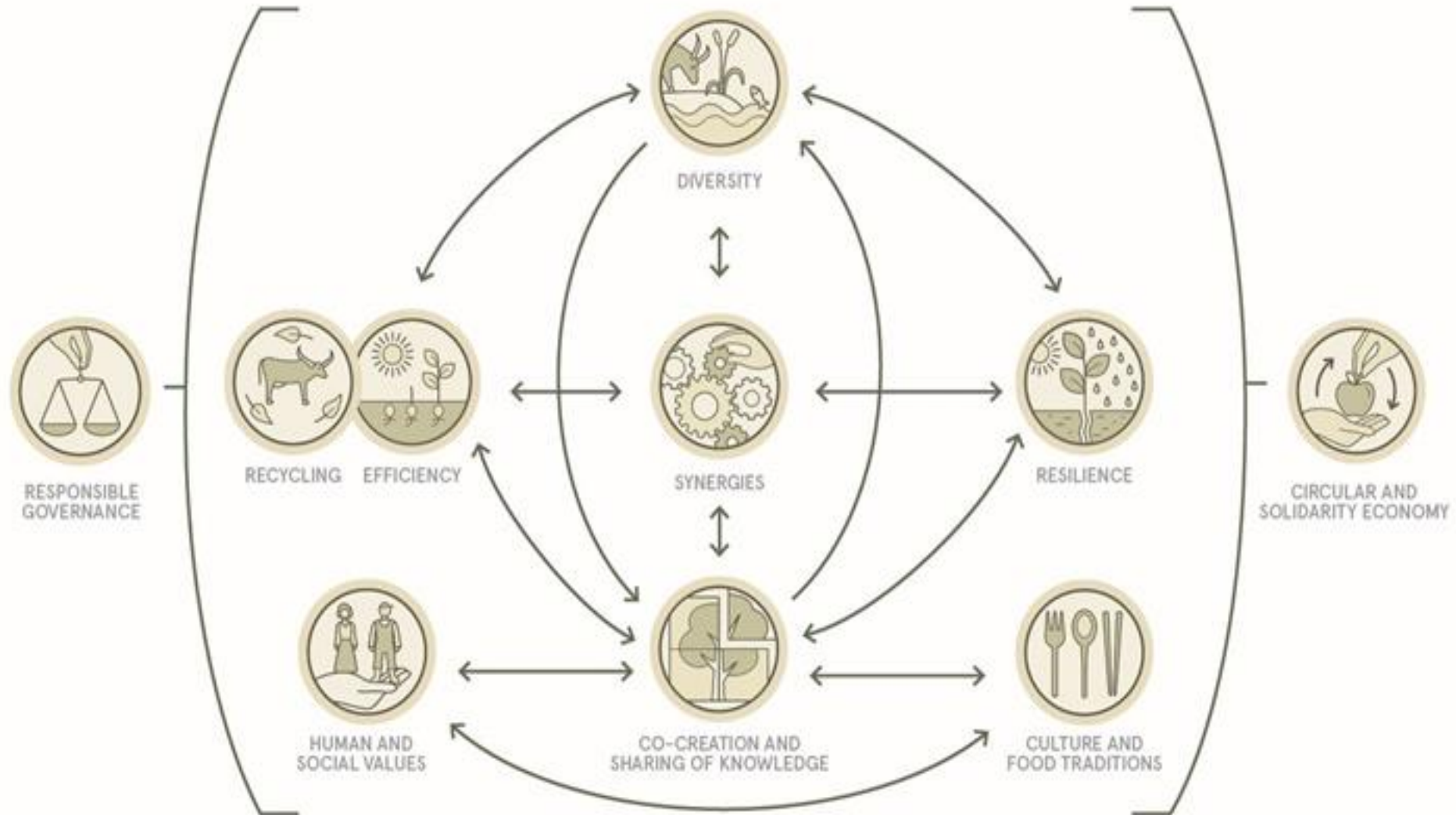
A different paradigm: diversified resilient and sustainable systems

A holistic, integrated approach to simultaneously reach:

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



Ten elements of agroecology



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

Economic outcomes of diversified agroecological systems

- Total productivity → =
- Income → +
- Resilience and stability → +++

→ Agroecology: to achieve food security while addressing the climate challenges

Increased economic performance

Country	Indicator	Performance A Versus Conventional
Netherlands	Income/kg of milk	+ 110%
France	Income/family worker	+ 73%
Germany	Income/dairy cow	+ 60%
Italy	Income/hour	+ 15%
Ireland	Gross margins per hectare	+75-80%
Poland	Income/farmer	+ 53%
Spain	Gross Value Added	+ 35%

Jan Douwe van der Ploeg, et al., Journal of Rural Studies,
<https://doi.org/10.1016/j.jrurstud.2019.09.003>

Agroecology in India: Community Managed Natural Farming

- 600,000 farmers in Andhra Pradesh
- 60,000 farmers in Karnathaka
- Productivity increased by 20% on average
- Net income increased by 50%

Zareen Pervez Bharucha, Sol Bermejo Mitjans & Jules Pretty, 2020

It includes the use of cow based microbial mixtures, mulching, improving functional on farm bio-diversity, enhancing soil microbial activity, agro-forestry systems, on-farm water conservation, cover cropping among others

Also in Africa and Latin America

Some examples:

ECOWAS Programme on Agroecology

Alliance for Agroecology in West Africa

National policy in Senegal

National policy on agroecology in Nicaragua

The Ministry of Environment & NR of Mexico (Semarnat) develops a plan to promote agroecology

Cuba has largely converted to agroecology

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>

Agroecology for adaptation

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**

Potential of agroforestry

The current global annual increase in tree biomass is now over 0.74 billion tons CO₂ equivalents.

Generalizing 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.

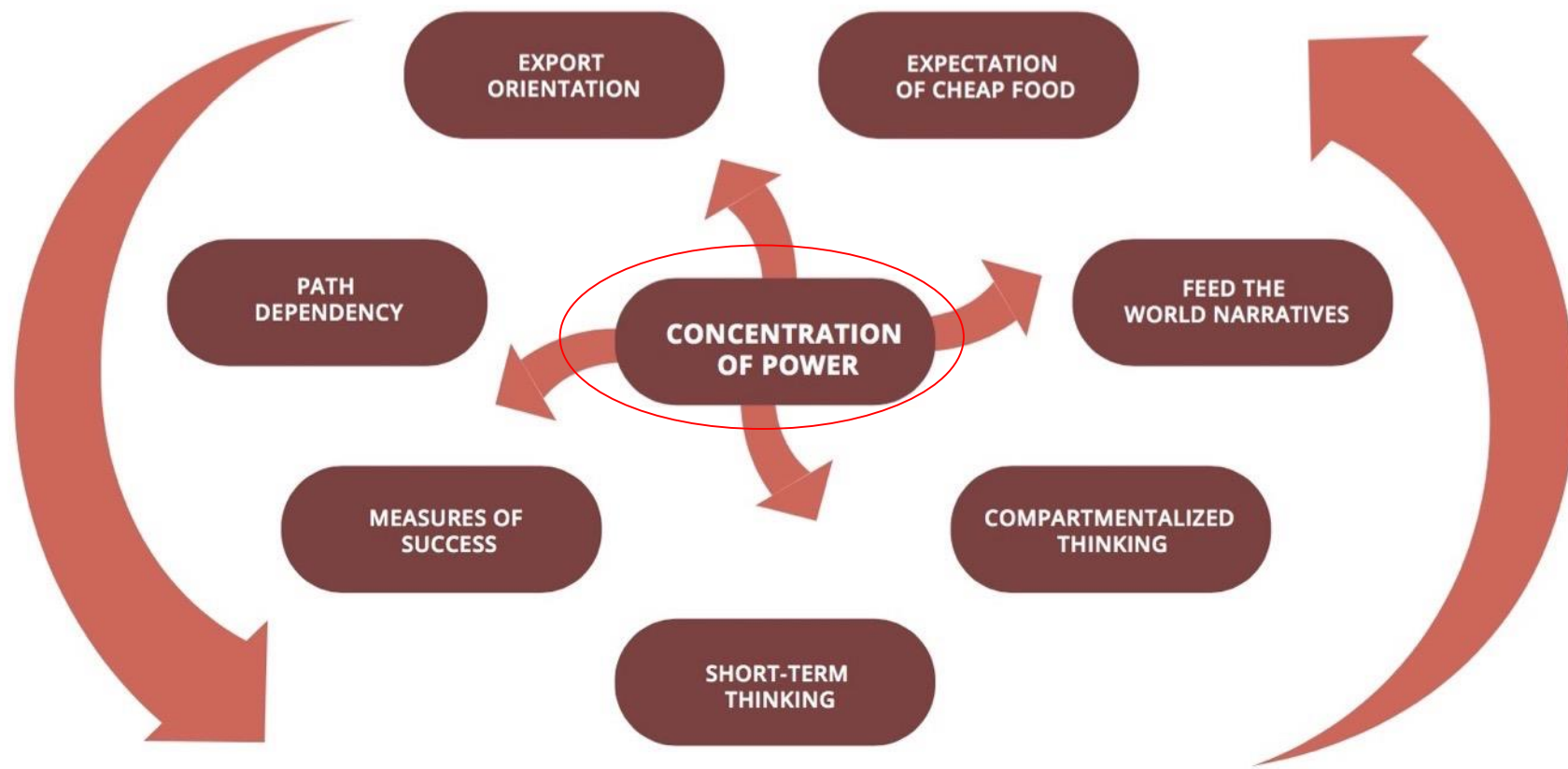
“If this carbon level increased by 0.4%, or 4 ‰ per year, in the first 30-40 cm of soil, the annual increase of carbon dioxide (CO₂) in the atmosphere would be significantly reduced”

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

(4 per 1000" Initiative at COP 21)



What prevents change: 8 Lock-ins

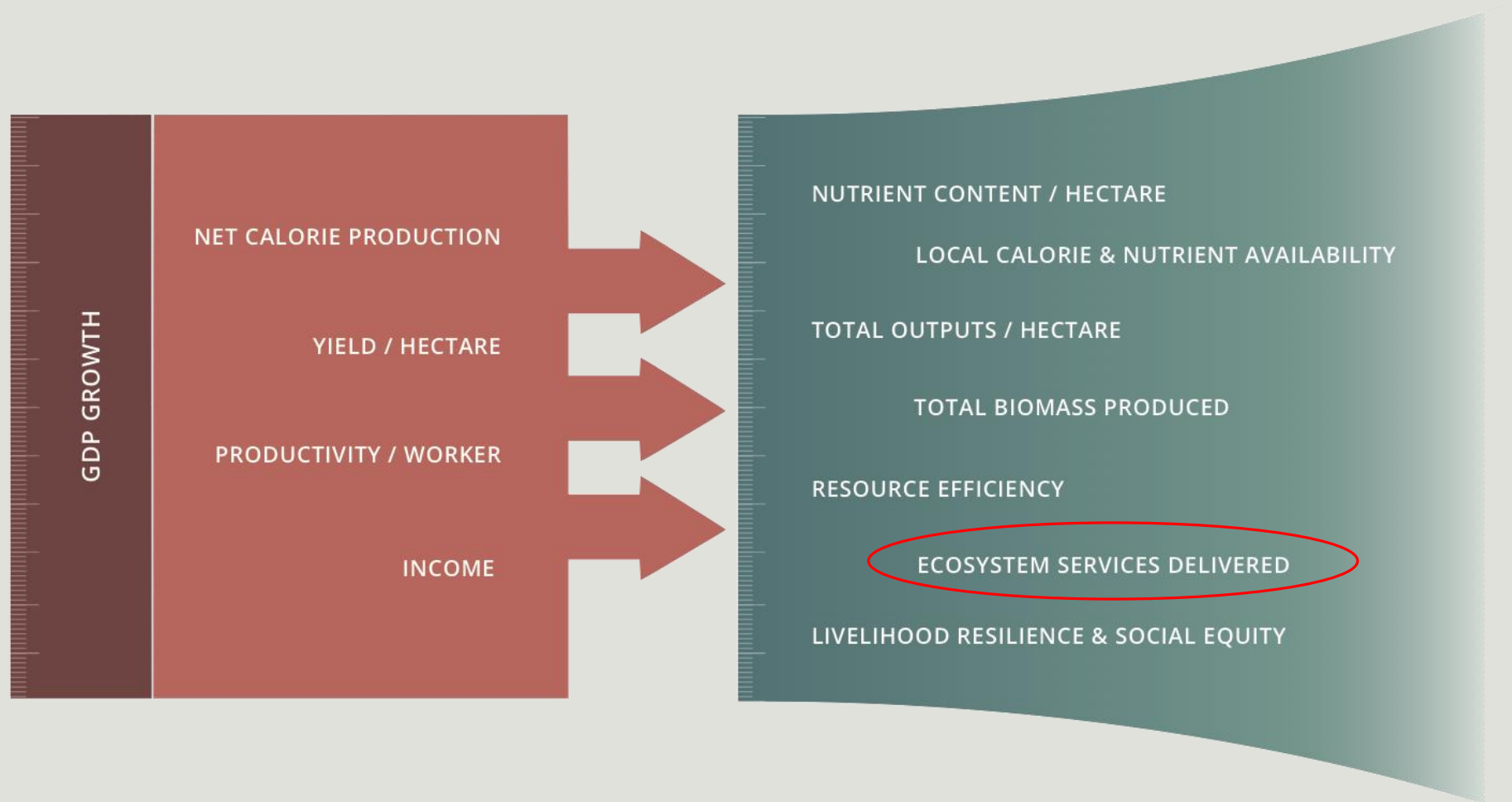


IPES-Food, 2016. From Uniformity to Diversity

Market concentration in multiple sectors

- **3 companies control 60% of commercial seed market.**
- **7 companies control majority of fertilizer sales.**
- **3 companies share 71% of agrochemical market.**
- **4 firms account for 97% of private R&D in poultry.**
- **4 firms control up to 90% of the global grain trade.**

Measuring what matters



Supporting the transition

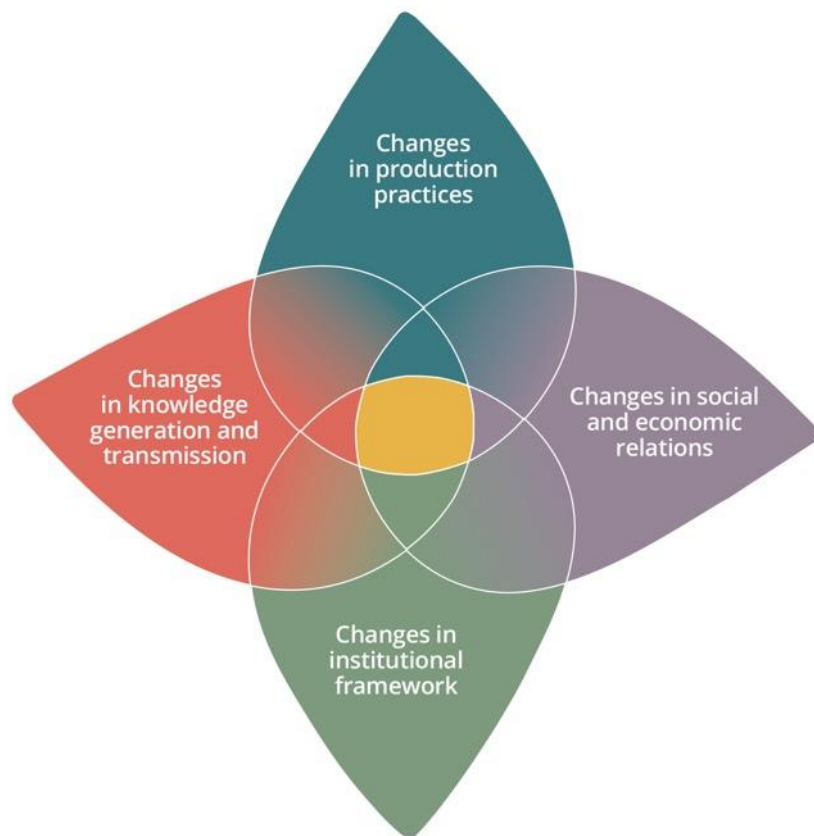
Support farmers during the conversion

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...



OCTOBER 2018

iPES FOOD
INTERNATIONAL PANEL OF EXPERTS
ON SUSTAINABLE FOOD SYSTEMS

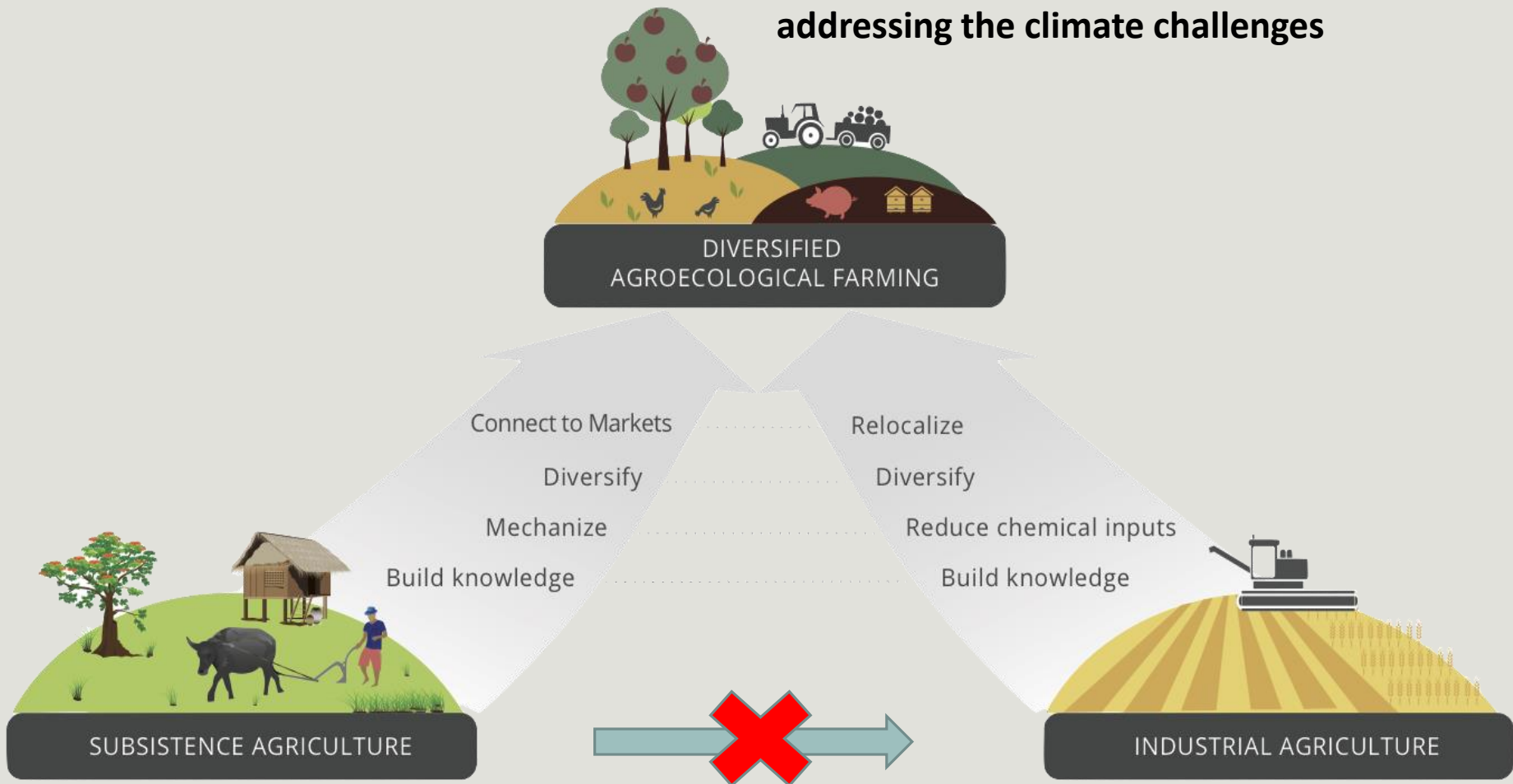
**BREAKING AWAY
FROM INDUSTRIAL FOOD
AND FARMING SYSTEMS**

Seven case studies
of agroecological transition

CASE STUDIES 02

Different pathways, common goal

Agroecology: to achieve food security while addressing the climate challenges



Thank you!



www.ipes-food.org