AGRI Innovation summit 2019

25-26 June 2019 in Lisieux,
Normandy - France

Thematic Session 2: What kind of production systems are needed for the sustainable management of natural resources

Workshop 2.2: Climate resilient farming and forestry systems and water management

Olivier PICARD, CNPF

https://www.reseaurural.fr/Sommet-agri-innovation-2019
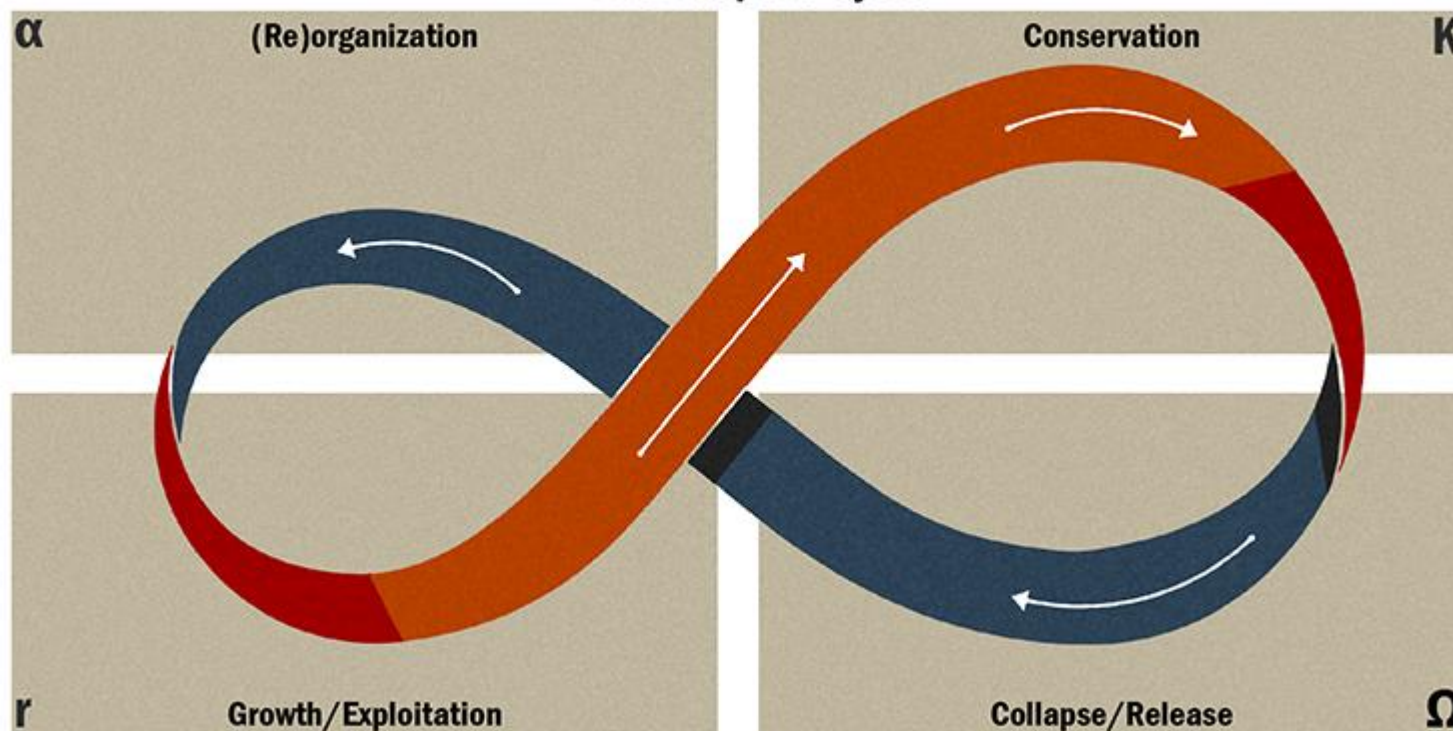https://ec.europa.eu/eip/agriculture/en/event/agri-innovation-summit-2019

Climate resilient systems

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CNPF -
France
Directore R&D and Europe

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The Adaptive Cycle

source: Holling, Gunderson and Ludwig, In Quest of a Theory of Adaptive Change, 2002

Key features of the agroecology project

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- **Systemic** thinking
- Agro-ecology is not a set of practices or recipes: solutions are **diverse**
- **Different** situations/contexts but every farmer is concerned
  - Efficiency → substitution → reconception
- **Collective dynamic** is a key factor to support the transition to agro-ecology
- Deals not only with the **farming** practices but also the agri-food **chain** and the **rural** and **territory** development

A diversity of situations to mix solutions ?

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Agroforestry

Change crops rotations

Pig farm extensification

Towards Forrage autonomy of
cattle breeding

Collective training and
transfer of knowledge

Organic farming

Use of biomass for
energy and
bioeconomy

1º Act on Driving forces (D): Mitigation

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- Reduction
- Carbon Sink

1.Mitigation

2º Act on Pressures (P) and Exposure: Microclimates

- Use / create microclimates to locate cultures
- Change time of practices

2.Microclimates

3º Act on the level of State (S) and Sensitivity: Ecosystem Resilience

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- Dams, lakes, ponds
- Keyline, swales, contour farming, halfmoon
- Mulch, Organic matter.
- Irrigation

3. Water & Soils

- Diversity of crops, species, varieties, genes
- Agro-forests and Agro-silvo-pastoral systems
- Diversity of elements and strategies, redundancy

3.Diversity

- Use plant and animal species adapted to (future) climate
- Select and improve species

3. Species

- Eficciency in the use of water, pastures, resources
- Good practices of trees, plants, animals, soil, water

3. Good Practices

4º Act on the level of Impacts (I): Protection

- Insurances
- Reinforce structures
- Increase storage
- Protect cultures and animals from heat waves, fire, storms, plagues.

4. Protection

Example of forestry system

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- Forest = 30% of french territory; 75% are private ownership
- Mitigates 28% of national GHG emissions
- 50% of carbon stock are in forest soil

Some elements of forest **adaptation strategy** to climate change :
- Improve **water balance** by thinning more intensively, and protecting soil (compaction, carbon storage…)

- Diversify sylviculture, to mix different forestry system in landscape = using **biodiversity** as a means of resilience

- Facilitate **migration** of trees species from south to north
  - Trees planted in 2019, will be harvest in 2099, It is necessary to adapt today

- Combine adaptation and **mitigation**

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Some questions about Innovations and solutions

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- Agro/Sylvo-Ecology seems adaptative agriculture and forestry ?

  – Come back to **farmer's/forester's common sense** ?
  – Go from agriculture to **agronomical know-how** ?
    - Fostering natural cycles of carbon, water, nutriments
    - To improve incomes, and profitability,
    - To improve food quality of agricultural products,

  – Adopt **new technologies**, precision farming ? smart farming ? Artificial Intelligence ? To be more efficient ?

  – Develop **diagnosis tools** to be more precise in the impact of practices ?
    - Water balance, carbon stock, vulnerability of system…

  – Develop model to **reduce uncertainties** of future ?
    - Climate scenario, effect on hazard sequencing

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