Facing climate change, similarities and differences between agriculture and forestry

COST Action FP0703 ECHOES

Topol'cianky, May 2011 4th, COST 734 Jean-Luc Peyron

Contents

- Similarities between agriculture and forestry
- Differences between agriculture and forestry
- Some consequences in adapting to climate change
- The COST Action ECHOES in brief

The comparison between agriculture and forestry is not easy but anyway interesting. What is stated here is probably debatable in the details. Only the general ideas are really useful.

Similarities

- Vegetable productions
  - As parts of ecosystems
  - As land uses competing for space
- Growth under the influence of
  - Genetic resources
  - Human management
  - Soil nutrients and fertility
  - Sun radiations (photosynthesis and C uptake)
  - Precipitations
  - Temperature
  - Disturbances …
- Support of industrial sectors
- Contribution to landscape
- Highly sensitive to climate variations and changes

Similarities

- Impacts of climate change affect:
  - Water availability
  - Soil fertility
  - Productivity
  - Extreme events such as drought and heat waves

➔but beyond similarities, some differences…

Differences in Activities

- Within agriculture
  - Annual crops
  - Cattle breeding
  - Fruit tree growing
  - Vineyard
  - Infrastructure and equipment
  - agroindustries
- Within forestry
  - Short rotation forestry
  - Long rotation forestry
  - Infrastructure and equipment
  - Forest industries
- Between agriculture and forestry

Differences in Inertia
Life cycles (1 to 200 years and beyond)

- Annual crops
  - Temporary pastures
  - Cattle breeding for meat
    - Cattle breeding for milk
      - **Short rotation forestry**
      - Industries
        - Infrastructure, equipment
          - Fruit tree growing
          - Vineyard
            - **Long rotation forests (timber)**
            - Long rotation forests (fiber)
            - Long rotation forests (services)
              - Permanent pastures

Time

Differences in Inertia
Delay before production

- Annual crops
- Temporary pastures
  - Cattle breeding for meat
- Cattle breeding for milk
  - **Short rotation forestry**
  - Industries
  - Infrastructure, equipment
    - Fruit tree growing
    - Vineyard
      - **Long rotation forests (timber)**
    - Long rotation forests (fiber)
    - Long rotation forests (services)
- Permanent pastures

Time

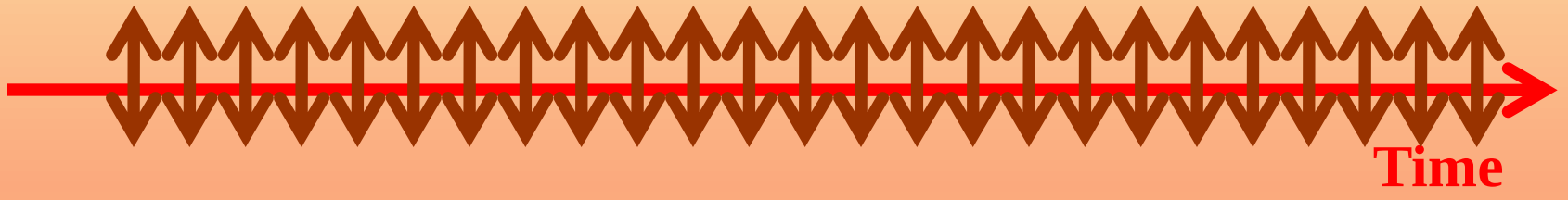
Differences inInertia
Frequency of outputs (after delay)

- Annual crops
- Temporary pastures
  - Cattle breeding for meat
- Cattle breeding for milk
  - **Short rotation forestry**
- Industries
- Infrastructure, equipment
- Fruit tree growing
- Vineyard
  - **Long rotation forests (timber)**
  - Long rotation forests (fiber)
- Long rotation forests (services)
- Permanent pastures

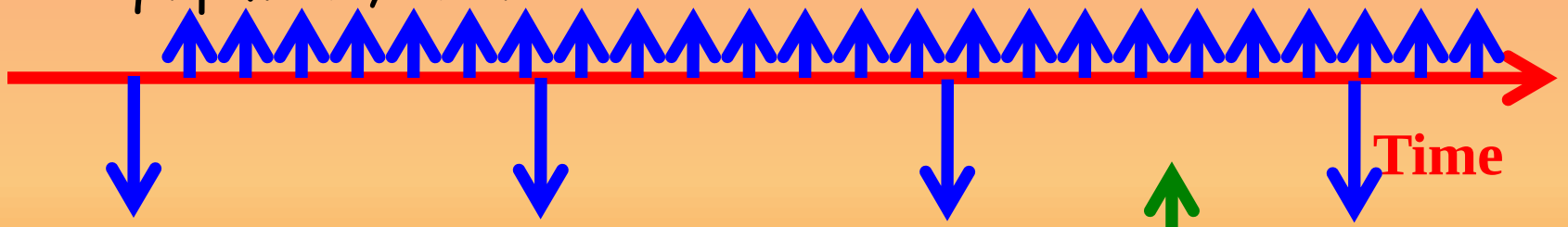
Time

Differences in Inertia
Types of investments

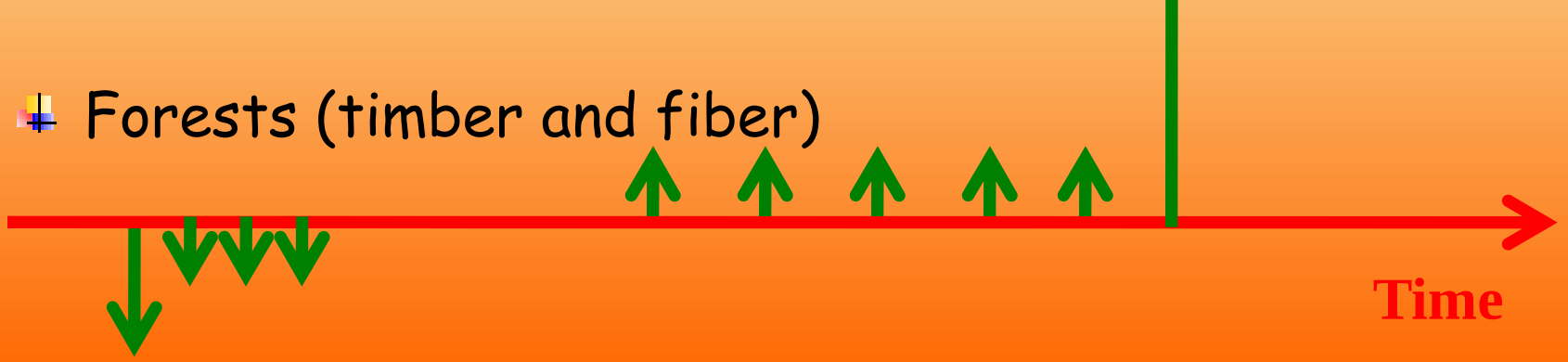
- Annual crops



- Fruit tree growing,vineyard, infrastructure, equipment, industries



- Forests (timber and fiber)



Differences in Complexity

- Agricultural ecosystems are less complex
  - More intensive production
  - More genetic selection
  - More chemicals
- The set of stakeholders is broader in forestry
  - Private forest owners are not forest managers
  - Public foresters have public goals
  - Extension of new techniques is more difficult

Differences in Impacts

- Temperature itself is perhaps more important in agriculture (buildings, cattle)
- Water availability:
  - irrigation possibilities in agriculture
  - but an additional problem with climate change
- Natural migration is a problem for forestry
- Extreme events
  - No fruits is a problem for
    - Agricultural production
    - Forest regeneration
  - Storms and fires: more important for forestry
  - Several forest production years are impacted
  - Insurance is more difficult in forestry

Differences in Mitigation

	Agriculture	Forestry
Land-use change		Deforestation to be avoided
Emissions due to production	important	
Sequestration		important
Substitution of materials		important
Substitution of energy	important	important

Consequences in adapting to climate change

- Climate change makes a bigger difference in forestry in comparison with "simple" climate variability
- Adaptation measures must be implemented sooner in forestry because of inertia
- The reduction of cycles, resilience of ecosystems are typical forest issues
- The dilemma between naturally and technologically driven systems is more balanced in forestry
- Adaptation and mitigation are more closely linked in forestry
- Irrigation and fertilization are agricultural issues
- Risk and crisis management are more important in forestry
- More efforts of extension are necessary in forestry
- R&D are necessary both in forestry and agriculture !

Expected Climate cHange and Options for European Silviculture

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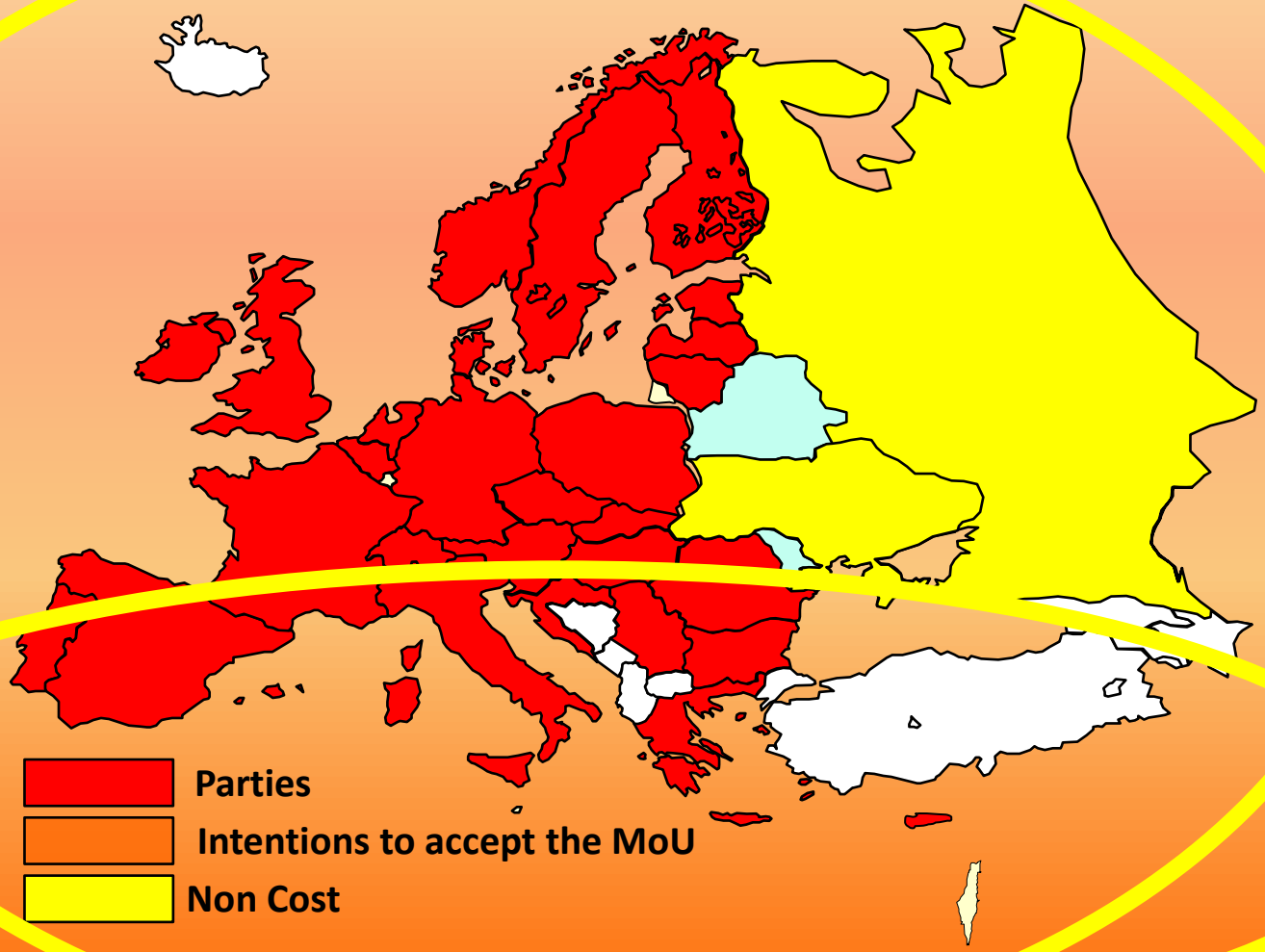
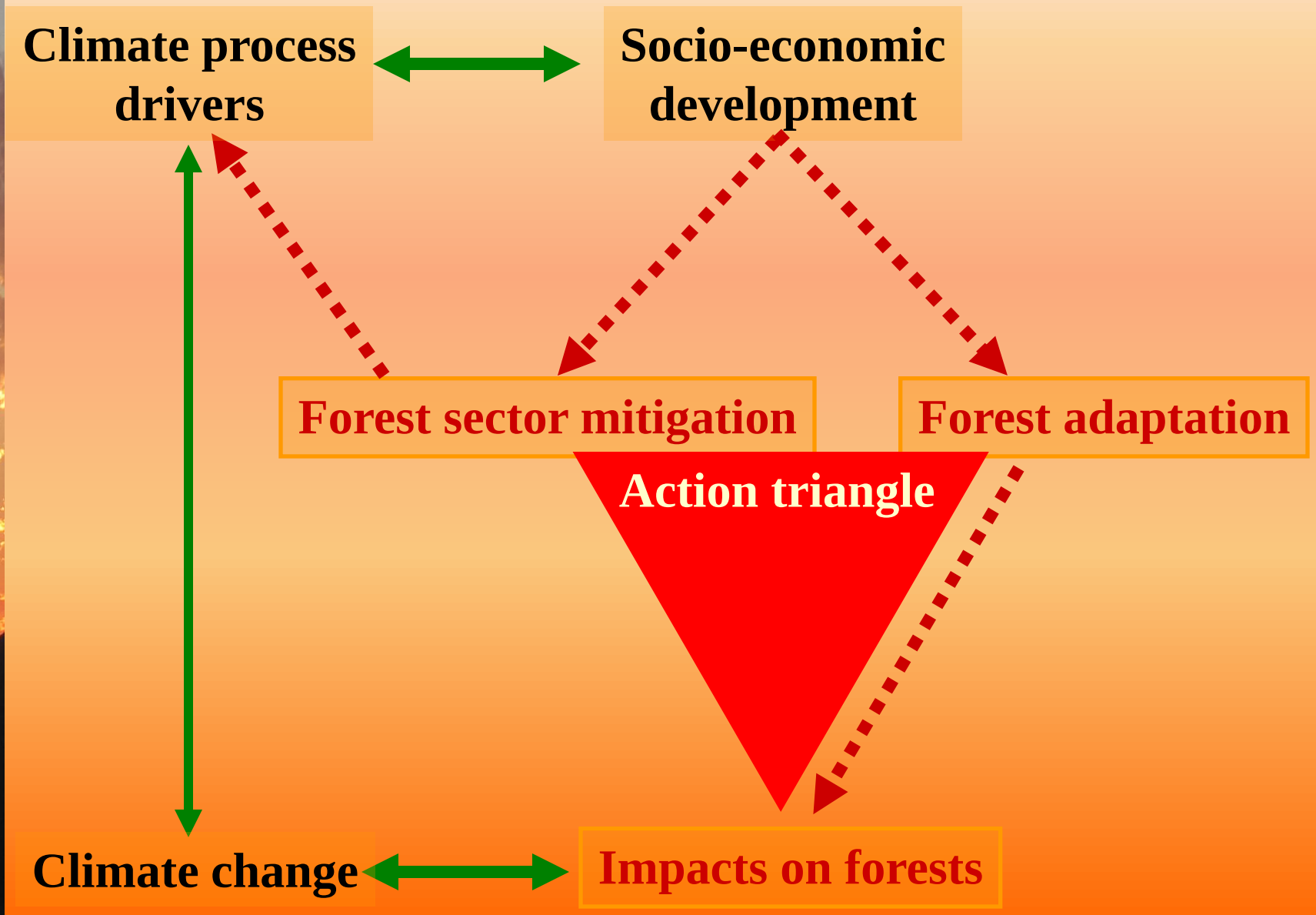
ECHOES Objectives

- Main objective:
  - to mobilize and integrate existing scientific knowledge on expected climate change for European forest policy makers and managers (➔ forest management and policy)
- Secundary objective:
  - to identify future research & development needs (➔ monitoring and research)
- Other objectives:
  - to contribute to IPCC Assessment Report 5
  - to supply a European perspective for the second commitment period after Kyoto Protocol

ECHOES Parties



Action triangle



Main ECHOES structure

IPCC Assessment Report 4	The Action Triangle
The physical science basis	
Impacts, adaptation, vulnerabilities	Impacts (WG1) Adaptation (WG2)
Mitigation	Mitigation (WG3)

ECHOES Cross-cutting issues

	Impacts	Adaptation	Mitigation
Interactions			
Regional specificities			
Sustainable forest management			

Continuous improvement process

Management criteria

Carbon uptake

Wood Production

Multifunctionality

Amenities, soil, water and biodiversity conservation

Echoes Outputs

ACTIVITIES AND OUTPUTS	Yrs May 2008-2012			
	1	2	3	4
Forest synthesis of IPCC				
Country reports WG I to III				
Key issues WG I to III				
cross-cutting issues				
Recommendations for policy & management				
monitoring and research				
Website				
Newsletters for ECHOES sympathizers				
for decision makers				

ECHOES significant highlights

- Country reports
- Database of adaptation measures in Europe
- Cross cutting issues between working groups

- Final recommendations (on-going)

- Final conference Tours, France, 21-24 May 2012

THANK YOU FOR YOUR ATTENTION

http://www.gip-ecofor.org/echoes/