



**“Agroforestry Systems.  
Comparative Analysis”**

**APPLIED PERIOD PRESENTATION**

**European Forestry Msc**

By Elena Ma.Tomàs Ferré  
Freiburg, November 2005

# Introduction

Applied Period. Topic.

## Agroforestry Systems

**“Managed use of woody perennials (trees, shrubs, bamboo, etc.) within agricultural or pastoral land use systems. In these systems both ecological and economic interactions are considerate” (FAO, 1993)**

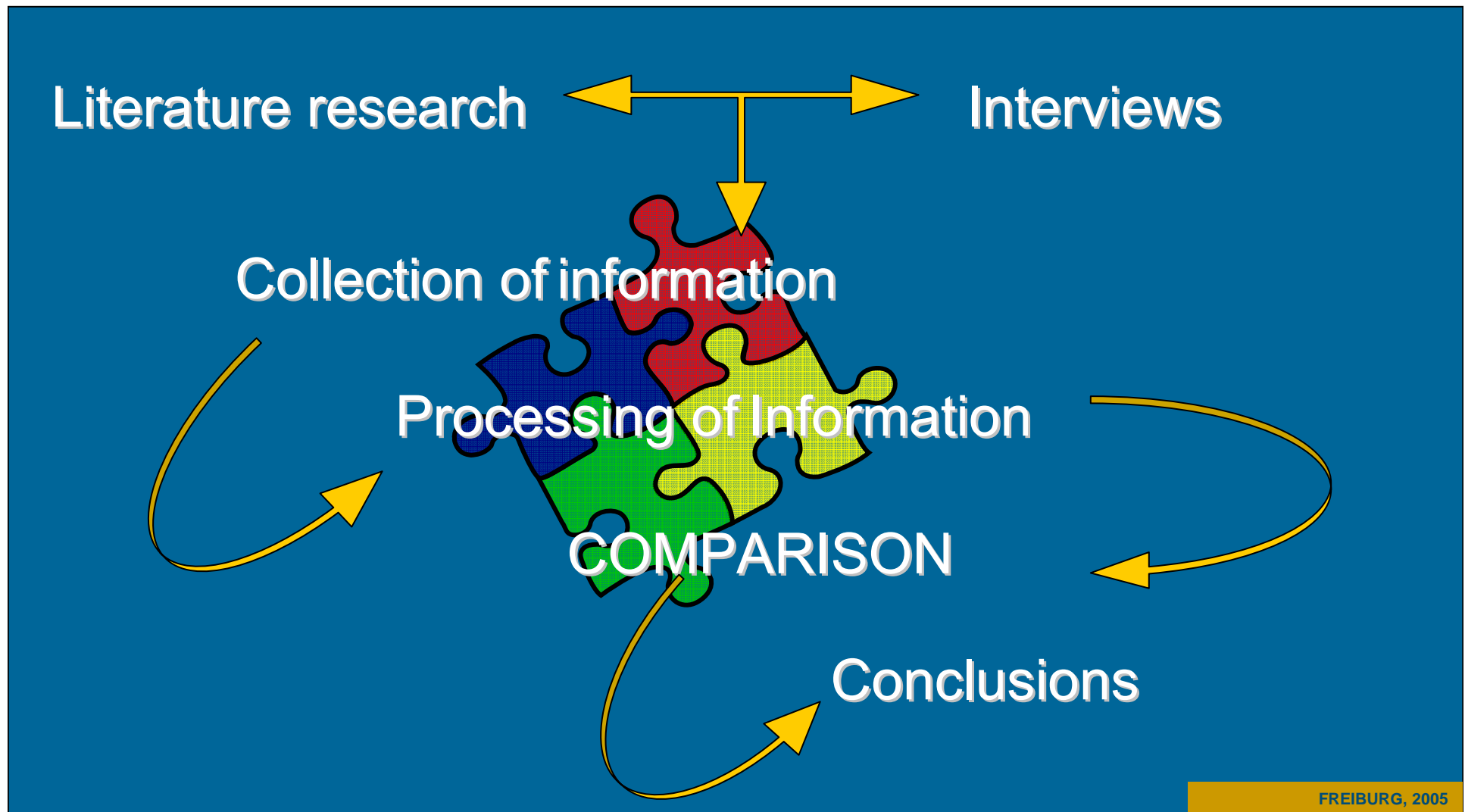
Comparison of two different

Silvoarable



st)

# Phases



# Details about SAFE project

- Involved research centers from France, Italy, Spain, Netherlands, United Kingdom and Greece

- Pr

- Fi

- Du

- An

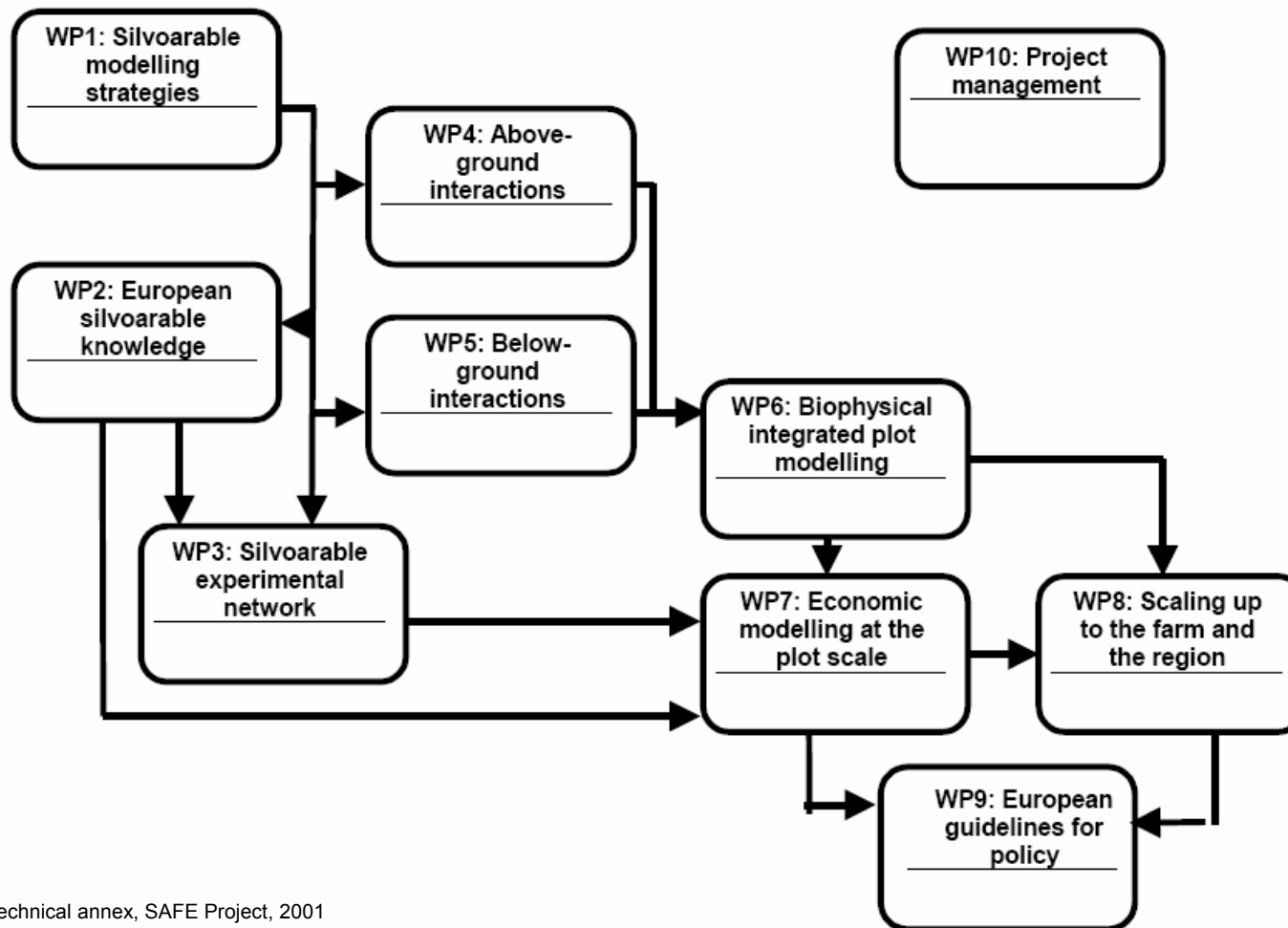


Biogeographical regions, 2001

- Alpine
- Anatolian
- Arctic
- Atlantic
- Black sea
- Boreal
- Continental
- Macaronesia
- Mediterranean
- Pannonian
- Steppic
- Outside data coverage

Fig: [http://www.eurosite-nature.org/article.php3?id\\_article=335](http://www.eurosite-nature.org/article.php3?id_article=335)

# Structure SAFE project I



Ref: Technical annex, SAFE Project, 2001

# Structure SAFE project II

- **WP6.** Production of an integrate model of tree-crop interaction
- **WP7.** Economic modelling at the plot scale
- **WP8.** Up-scaling to farm and regional scale
- **WP9.** Developing European guidelines for policy implementation
- **WP10.** Project management



# Technical details about SAFE project I

- **Goal**

- develop biophysical and socio-economics tools to inform farmers and policy-makers of the potentialities of agroforestry systems in Europe

- **Objectives**

- Reduce the risk of failure of agroforestry projects
- Extract the maximum benefits from individual farms or farms clusters
- Incorporate agroforestry in European policy



Foto: [www.montpellier.inra.fr/safe](http://www.montpellier.inra.fr/safe)

# Technical details about SAFE project II

## Achievements/Methodology



Foto: [www.montpellier.inra.fr/safe](http://www.montpellier.inra.fr/safe)

- Improvement of knowledge on key tree-crop interactions
  - Creation of European agroforestry database
  - Characterization of tree and crop light competition
  - Analyze the exploration capacity of fine roots



# Technical details about SAFE project II

## Achievements/Methodology

- Improvement of knowledge in integrate modelling
  - Identification of modelling strategies and developing a common modelling platform
  - Creation of standardised experiment formats
  - Validation of the model and the different modules
  - Integration of different modules

# Technical details about SAFE project II

## Achievements/Methodology

- Exploration of the potential for silvoarable land use
  - To relate biophysical, biological and social aspects by geographic information systems



Foto: [www.montpellier.inra.fr/safe](http://www.montpellier.inra.fr/safe)

# Technical details about SAFE project II

## Achievements/Methodology

- Legal and taxation innovations Europe
  - Survey farmers' reaction
  - Connection of biophysical model with economical modules
  - Policy proposals

# Details about Agroforst project I

- Cooperation-Research of two Institutes of Forest Faculty (U. Freiburg) & a Institute of Ministry for Food and Rural Regions.

- Project coordinated by Institute of Forest Growth
- Financed by German Federal Ministry of Education and Research (BMBWF)

Institute for  
Environmental Land  
Cultivation Müllheim

ifuL

Agroforst

Institute for Forest  
Growth



Institute for Landscape Ecology and  
Land-use



# Details about Agroforst project II

- Localized in to Federal states of Germany
- Duration 3 years from 2005 to 2008
- Around 5 German Scientists



Ref: Brix, M.; 2005

# Structure Agroforst project

- **WP 1.** Agroforestry systems for valuable timber production
- **WP 2.** Valuable timber production in open landscapes
- **WP 3.** Valuation ecological and landscape-aesthetical effects of agroforestry systems



Foto: <http://http://www.montpellier.inra.fr/safe/>



Images BD Paysages® agence GVA.



# Technical details about Agroforst project

- **Goal**
  - Creation of new models of land use more sustainable for Germany
- **Objectives**
  - Economical evaluation of agroforestry systems
  - Improvement of knowledge about agroforestry management
  - Ecological and social evaluation of agroforestry systems
  - New regulations to implement the agroforestry systems into the practise

# Technical details about Agroforst project

## Possible: Achievements/Methodology

- Economical evaluation of agroforestry systems
  - Balance between outputs, inputs and subsidizes in all parts
- Improving of knowledge about agroforestry management
  - Tree-crop light interaction modelling and other interactions (soil exploration capacity, water, nutrition...)
  - To study the biological and biophysical indicators
  - Dasometry studies and volume modelling
  - Evaluation of existing tree-crop interaction information, as well tree growth information

# Technical details about Agroforst project

## Possible: Achievements/Methodology

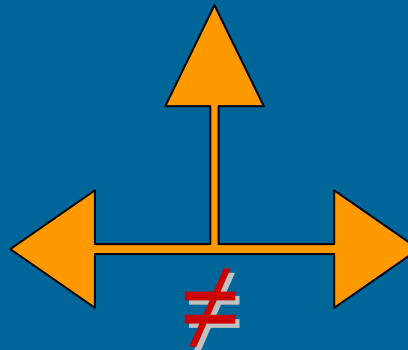
- Ecological and social evaluation of agroforestry systems
  - To study the biological and biophysical indicators
  - Owners and population surveys
  - 3D land modelling
- New regulations to implement the agroforestry systems into the practise
  - Land law framework study
  - Information exchange between researchers and stakeholders

# Comparative Analysis I

≡ disclose the agroforestry system at the society  
≠ Scale

Initiate and establishing the basis of agroforestry  
concepts for implementation these systems in  
the field

Agroforst: Effective and  
useful sustainable  
development in Germany



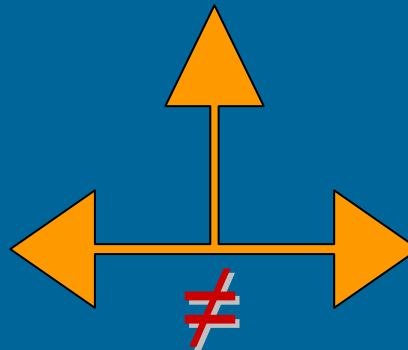
SAFE: European scientific  
interchange

# Comparative Analysis II

≡ To delve the ecological, biodiversity and landscape effects of the agroforestry systems

\* ≡ knowledge about the different interactions between the different systems components

Agroforst: Economical aspects

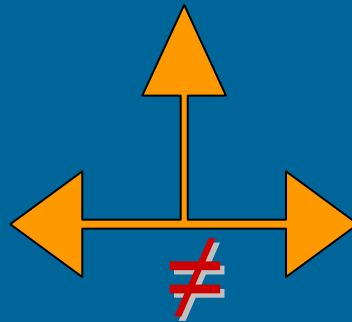


SAFE: Ecological interactions



\*  Evaluation of the social component

Agroforst: the most important stakeholders



SAFE: farmers' response

SAFE: The creation of agroforestry modelling-  
programs

\* Agroforst: To get good management knowledge



# Comparative Analysis III

## Methodology

≡ Study the light competition

≠ Modelling Techniques

≡ Study the below-ground interactions

≡ Techniques

≡ Study of the biodiversity

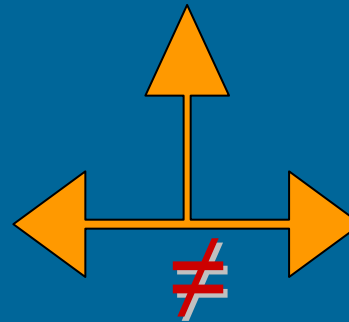
≡ Techniques



## Methodology

### Study of the society response

Agroforst: Surveys & 3D  
Land simulator—the most  
important stakeholders



SAFE: Surveys—farmers

Agroforst: To apply more techniques and efforts to  
the forest measurements

Localization the techniques are different, as well  
the finality of this localizations

# Conclusions I

- Projects working in same direction could be completely different depending of scale the work on
- Big modelling programs could contribute to get general information
- The tree-crop interaction knowledge is basic for agroforestry projects (light and root competition)

## Conclusions II

- The culture is an important aspect for the implementation of these systems
- The lack that exist on agroforestry law framework in Europe and in most of European countries  
→ Difficulties for implementation
- Important factor to considerate the sustainability of agroforestry systems  
→ The economical factor



A large, spreading tree with a thick trunk and many branches, situated in a lush green field. In the background, a cow is grazing. The sky is clear and blue.

**Thank you for your attention**

**Vielen Dank für Ihre Aufmerksamkeit**

**Gràcies**