



FORESTERRA

Enhancing FORest REsearch in the MediTERRAnean
through improved coordination and integration



Foresterra Final Conference

Lisbon, November 24th-25th December

Towards Innovation driven Research in Mediterranean Forests

Inazio Martinez de Arano

EFIMED



About innovation

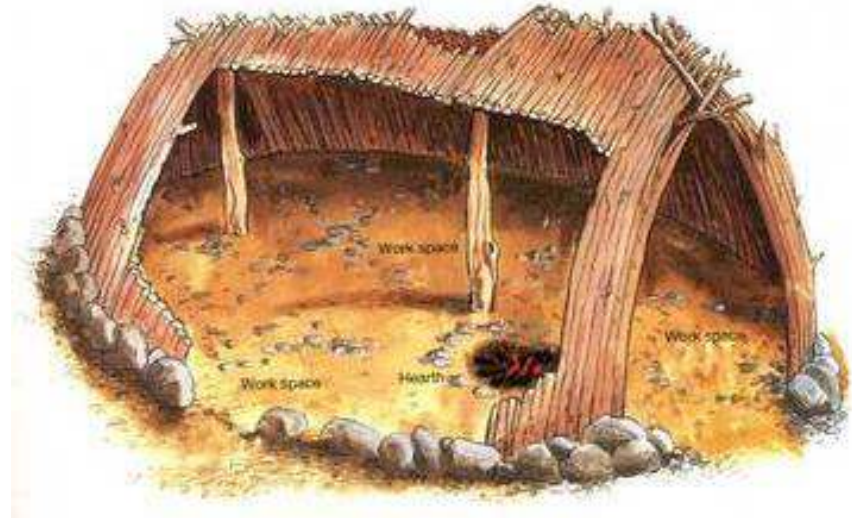
Ideas at work... making things happen



Villa, Paola (1983).



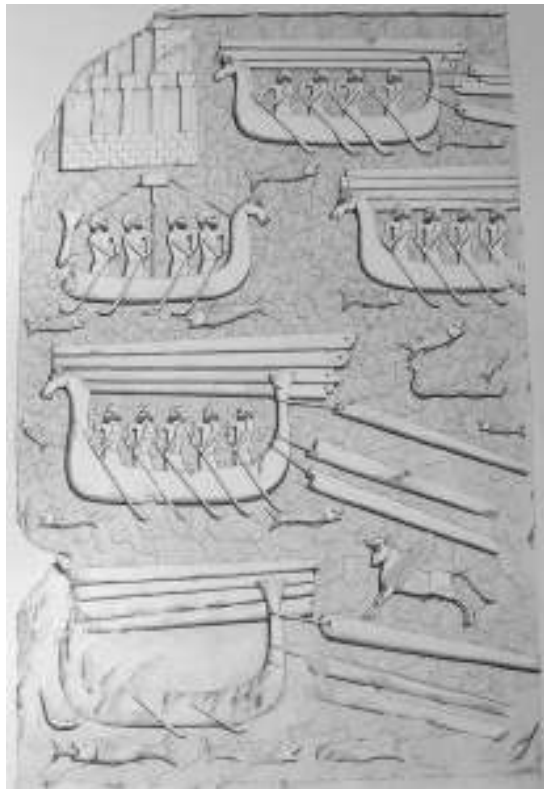
Human action is influencing vegetation dynamics for millenia



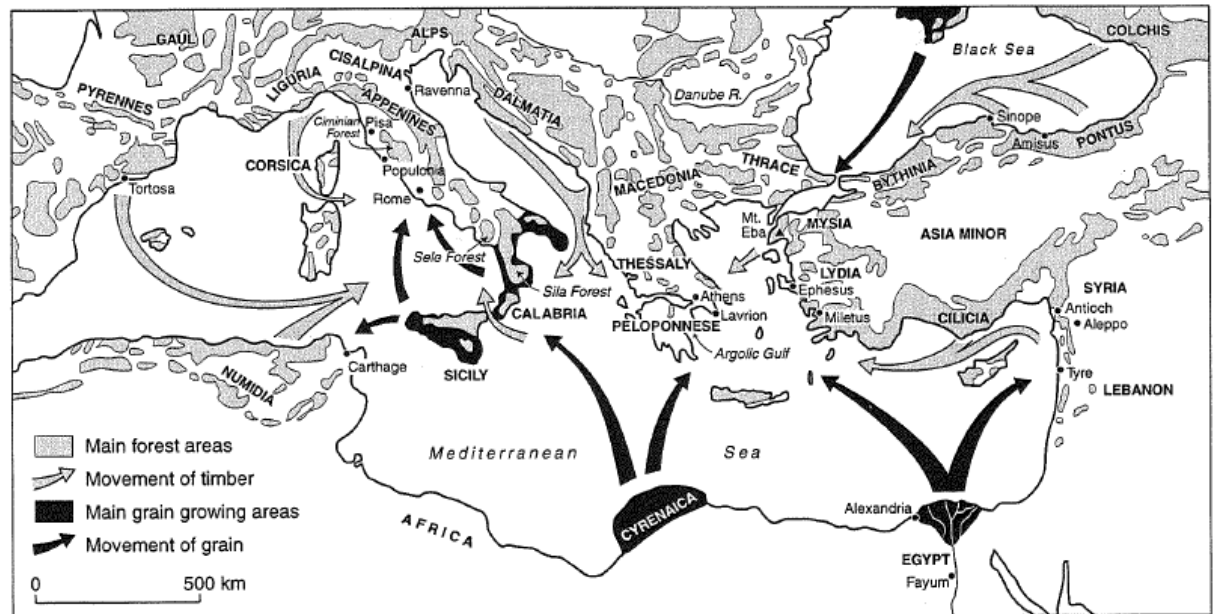
Humans used fire at
Terra Amata, french Riviera (300.000) BP
Villa, Paola (1983).



Mediterranean Forests: a source of richness



reliefs from the northwest façade of court VIII of Sargon's palace at [Dur-Šarruken](#)



Wood trade in the mediterranean IV-I Century BC.
(cited in M. Williams 2013)





Mediterranean Forests: resilient and productive

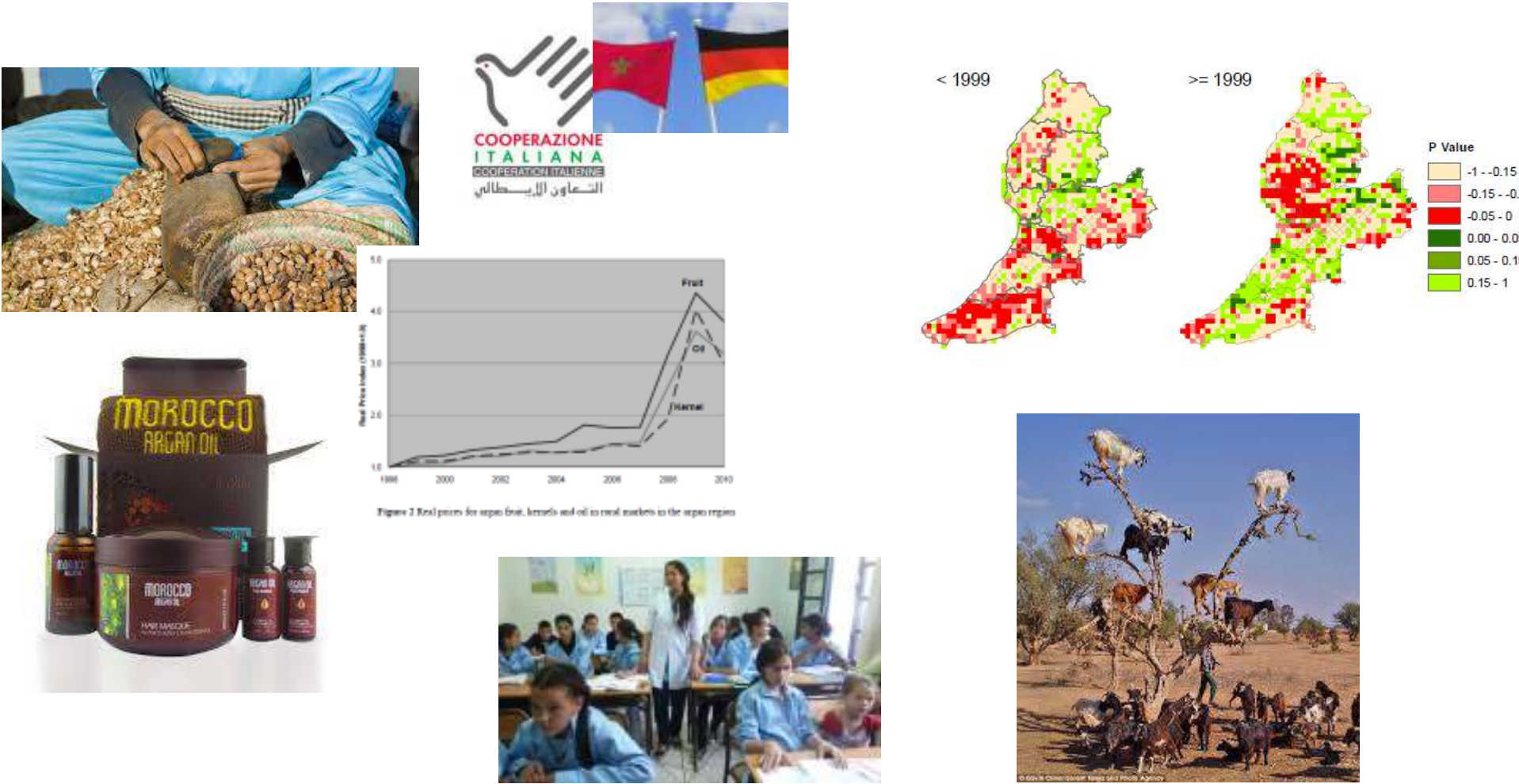


The Siege of Nice by Khayr ad-Din in 1543 Matrakci Nasu, 16th century



Message 1

Forest are complex social ecological systems

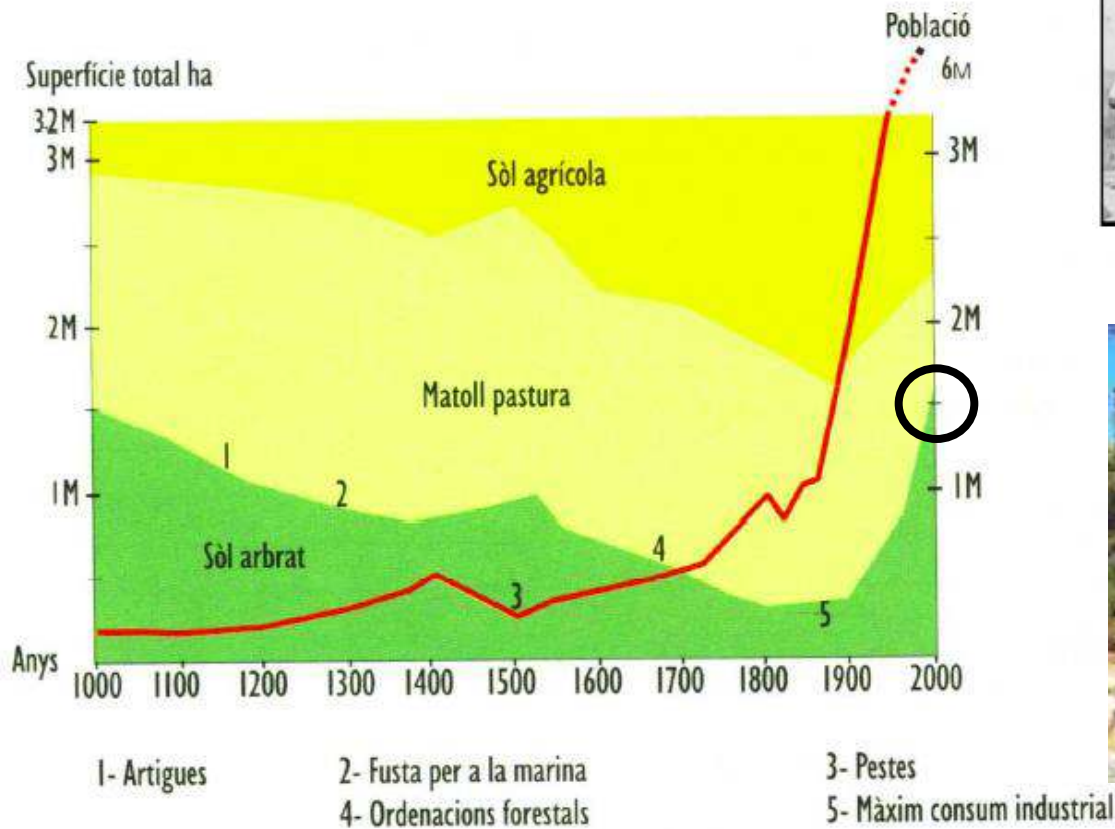


Lybbert et al 2010



Deforestation-Reconstruction-SFM

Food for thought





Causes of fires

1) Land Abandonment

**Biggest forest area
in centuries!!**

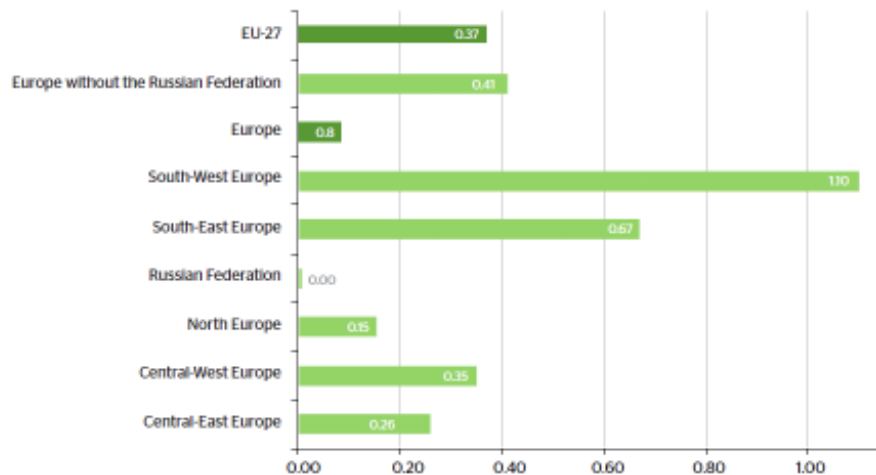
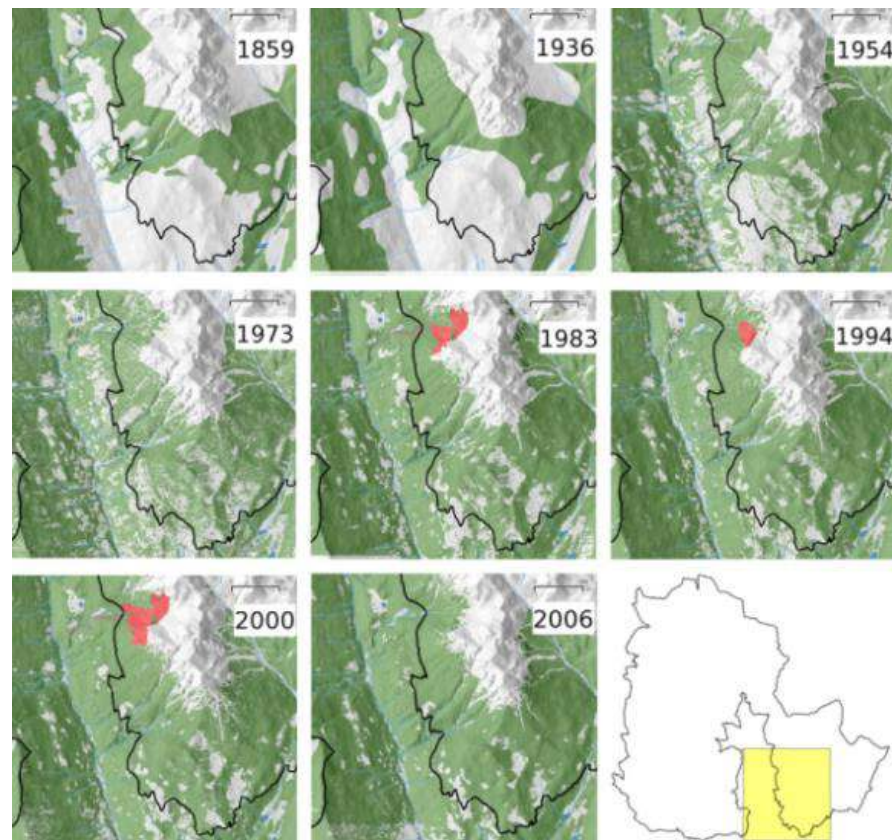


Figure 5: Annual rate of change in forest area by country, 1990-2010 (percent)



Paneveggio forest

Tattoni et al. 2010



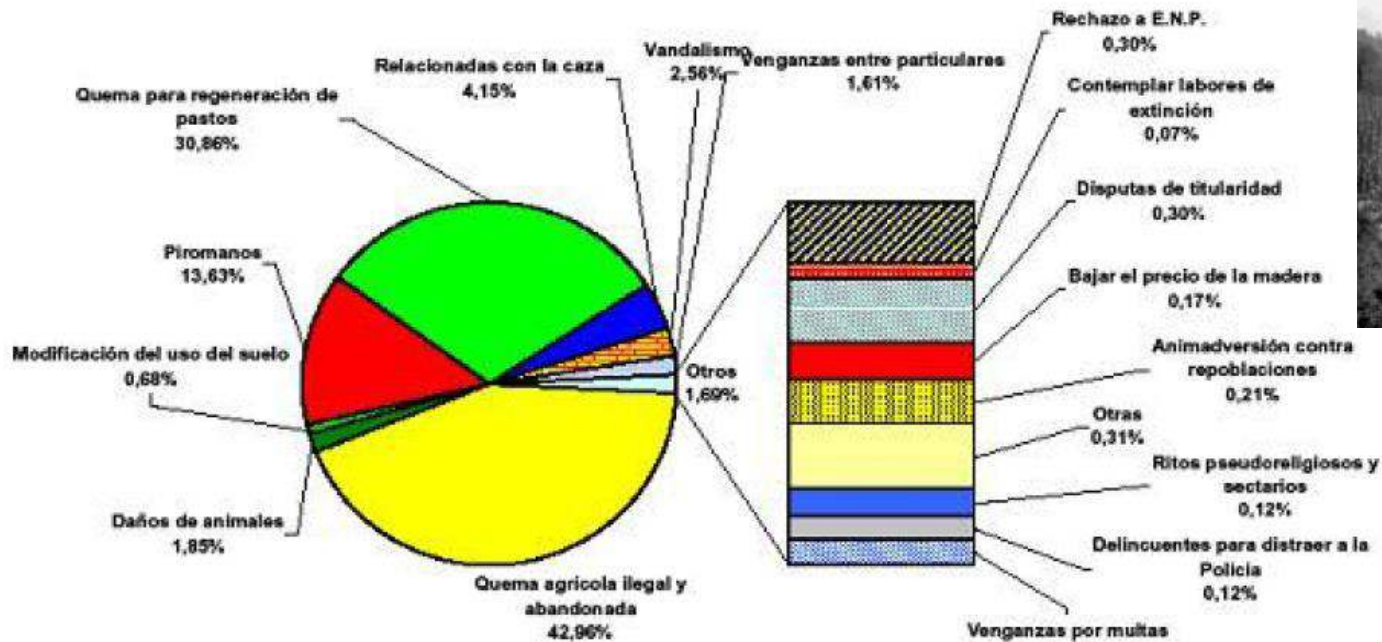


Causes of fires

2) Use of fire for vegetation management

90% of Ignition is related to human activities
80% are caused by negligence or intentionality

% de incendios intencionados con indicación de motivación: 47,83 %



Torre, M. 2009 based on Spanish forest fire database



Deforestation peaked with the industrial revolution with long lasting ecological and cultural consequences.

Almost a quarter of Morocco's forests (10,000 km²) vanished between during the *protectorate* in the XX century.

In the Tunisian mountains, forest cover shrank by one-third between 1919 and 1960

(Brandt and Thornes 1996).

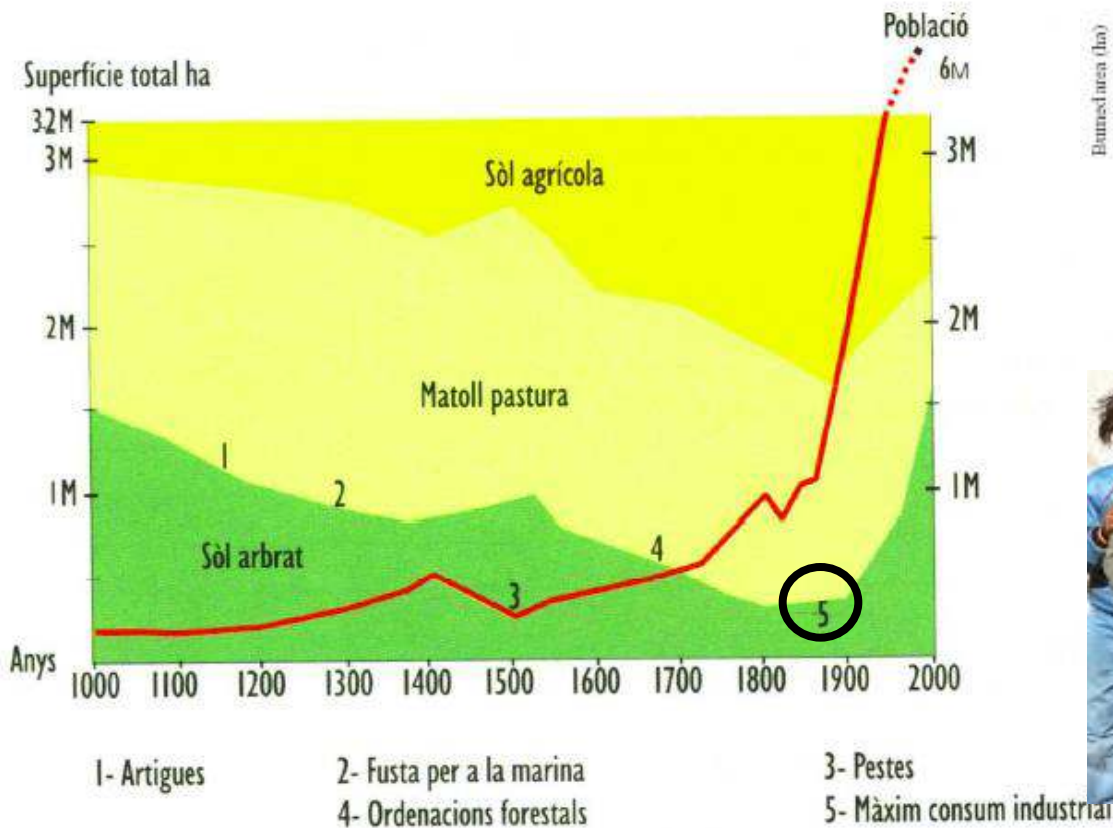


G. Agricola. A philosophical treatise on husbandry 1721



Deforestation-reconstruction

North African countries



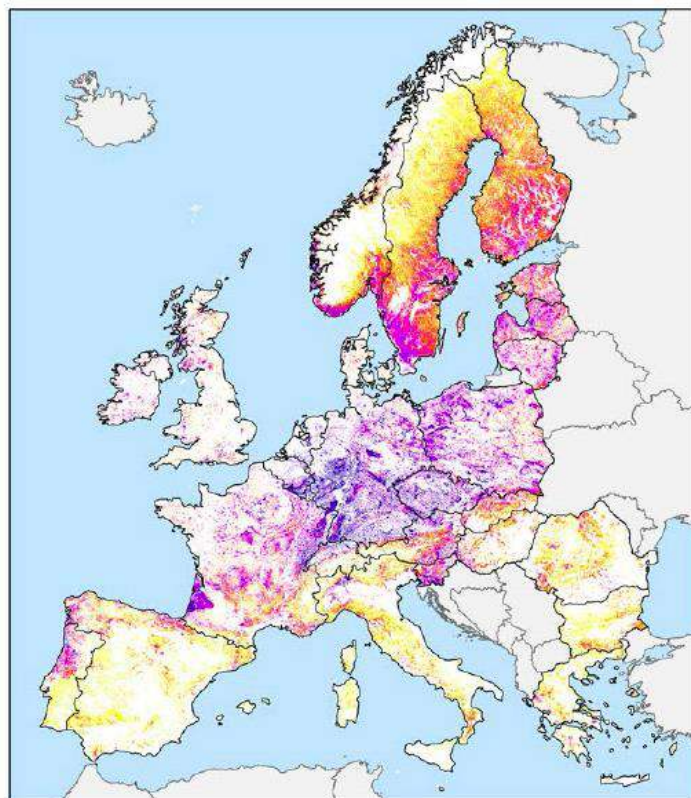
Trend: area burnt in Argelia





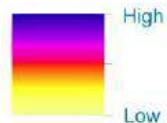
Deforestation-reconstruction-SFM

Central european and Nordic SFM



Forest harvesting
intensity

GLM-predicted
forest harvesting
[m³/ha forest]



Project: Volante-EP7-ENV-2010-265104
Institution: Geography Department (USER)
Author(s): T. Kuemmerle
Date: 16-10-2012
Version Number: V1.0
Cartographic References: LAEA, ETRS 1989

0 250 500
kilometers





Message 2

SFM is basically a social issues, not technical

- Sustainable (i.e. renewable)
- Contributing (optimally) to societal challenges
- Or maybe better said « needs »
« Wills » « Preferences »?
 - Efficient
 - Carbon negative
 - Improving livelihoods



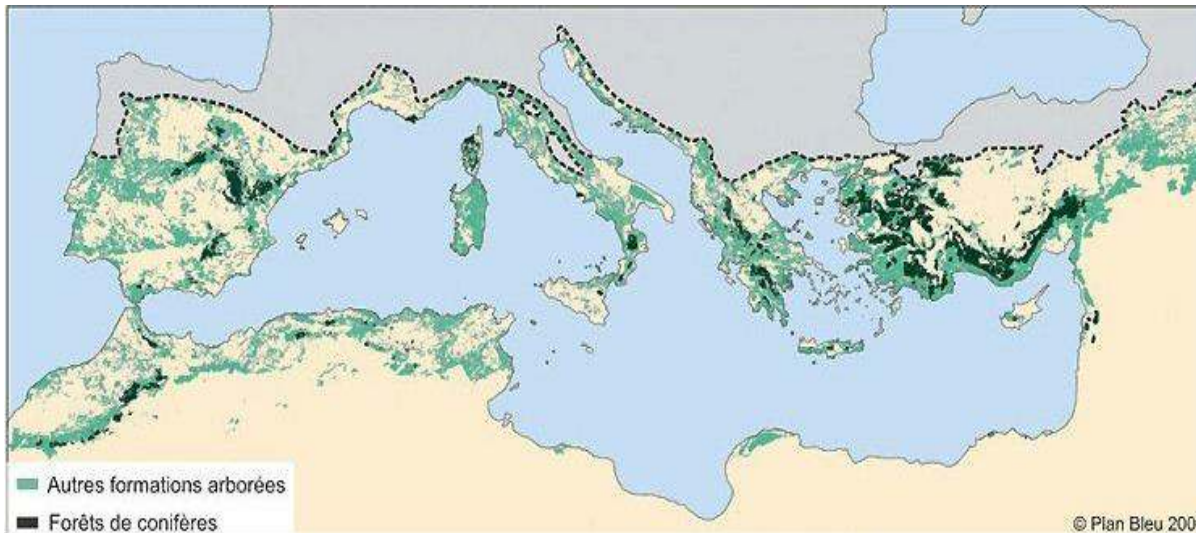
Creating value





Mediterranean Forests

80 M ha (9% land)



Water limited
High altitudinal gradients
Shaped by fire
Low productivity
High biodiversity
Oak/pines/eucalypts





Mediterranean Forests:

80 M ha (9% land)

The Mediterranean Region is characterised by mild winters and hot, dry summers...

...Rain is usually concentrated in late Autumn... violent precipitation events may occur...

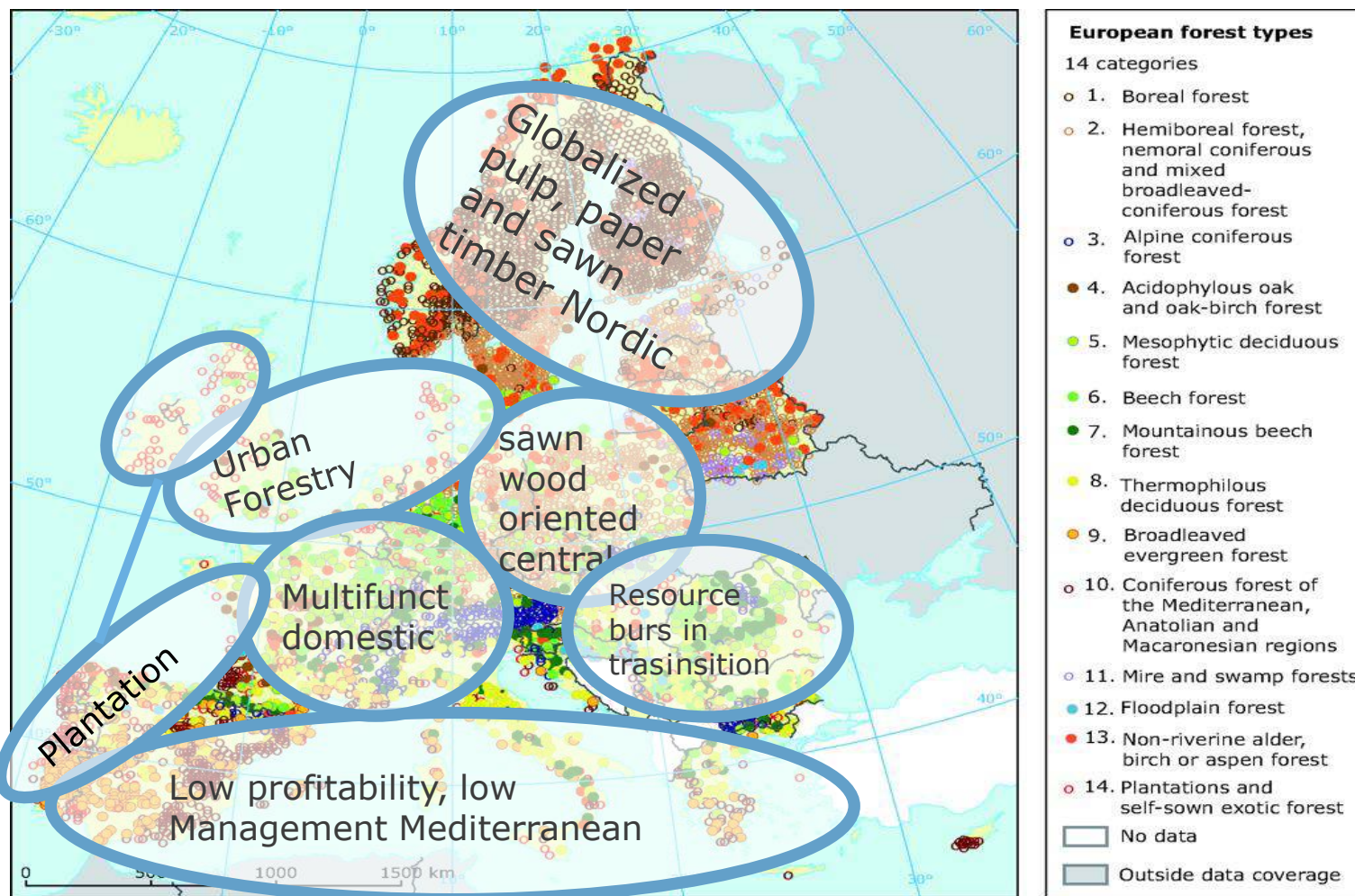
Water, not light or temperature is the limiting factor...

... dry winds may favour the spread of forest fires...

around 25,000 species of vascular plants, (50% are endemic species) and a high degree of tree richness and endemism (290 indigenous tree species with 201 endemics) with extraordinary genetic diversity



European forests types, a summary



IIASA 2008
Study of the
Effects of
Globalization
on the
economic
Viability of EU
Forestry



Mediterranean Forest in the cross-road

- Globalisation
- Societal change
- Low carbon economy
- Climate change
- Biodiversity
- wellbeing



Forestry in across-road

- Globalisation, population growth, consumption

- * Production moves to the **SOUTH**
- * Manufacturing moves East
- + * Demand moves East
- * Forest Sector loses weight in trade
- * **EUROPE** loses centrality

Low profitability of forestry

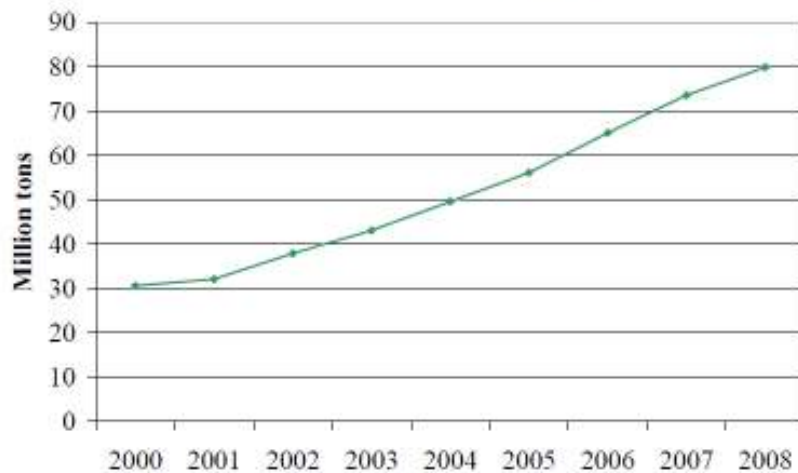


Forestry in across-road

- Globalisation, population growth, consumption

GRAPH 4.3.1

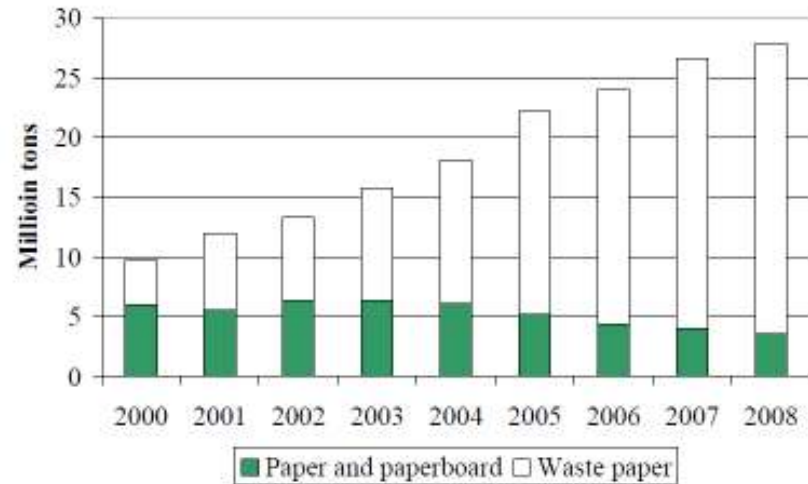
China's production of paper and paperboard, 2000-2008



Source: China Paper Association, 2009.

GRAPH 4.3.3

China's imports of paper and paperboard (including waste paper), 2000-2008



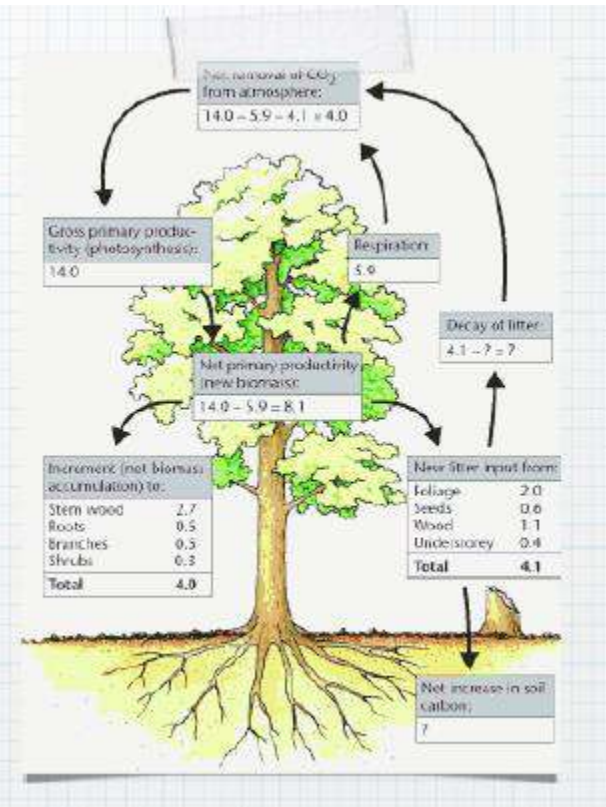
Source: China Paper Association, 2009.

Forestry in across-road

- Climate Change: «*The bioeconomy or green economy* »

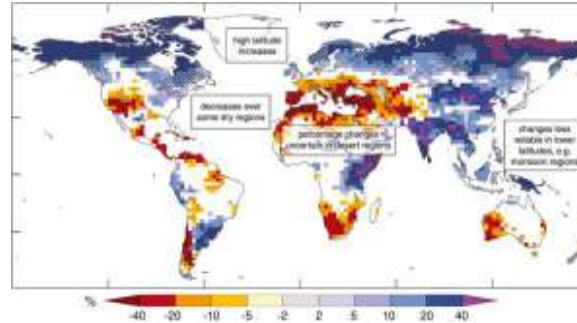
Mitigation bio-economy

- * Carbon sequestration
- * Biomaterials
- * Bioenergy





Climate change adaptation





Adaptation Options

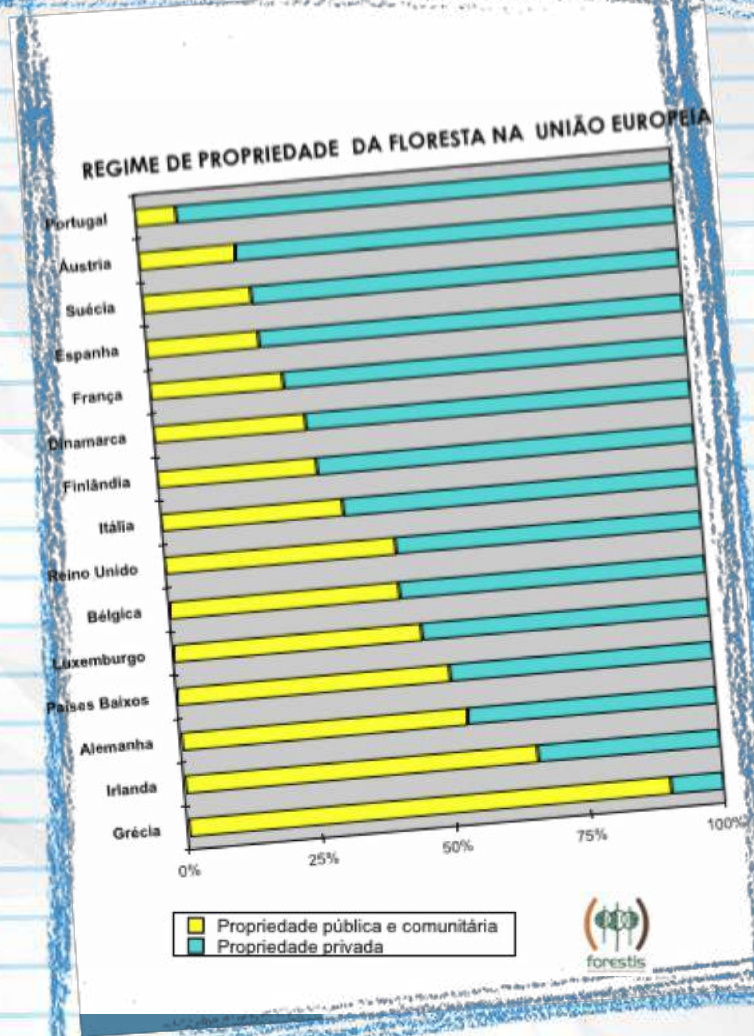
6 MANAGEMENT FOR ADAPTATION

Appendix 6.4 Strategic- and operational-level climate-change adaptation options that may be considered to achieve the management objective of maintaining the productive capacity of forest ecosystems. Adapted from Ogden and Innes (2007a).

Impact	S/O	Adaptation Options	B	Te	S	Tr
Changes in the frequency and severity of forest disturbance	S	Practice high-intensity plantation forestry in areas managed for timber production where an increase in disturbance is anticipated	C	C	C	C
	O	Assist in tree regeneration	B	A	A	A
		Maintain seed banks (in soil or trees)	A	A	A	B
		Actively manage forest pests	A	A	A	A
		Increase the stability of stands through increasing species and structural diversity, de-emphasizing means to enhance or maintain short-term productivity	D	B	D	D
		In drought-prone areas, increase the use of pre-commercial and commercial thinning to enhance the tolerance of the remaining trees and introduce drought-resistant species where appropriate	B	B	B	B
		Preferentially use coastal provenances of species in areas likely to be affected by increased windstorms	-	B	B	B
Changes in forest growth	O	Practice high-intensity forestry in areas managed for timber production to promote growth of commercial tree species	C	B	B	C
		Include climate variables in growth and yield models	A	A	A	A
		Enhance forest growth through forest fertilization	C	C	C	C
		Employ vegetation control techniques to offset drought	C	C	B	B
		Pre-commercial thinning or selective removal of suppressed, damaged or poor quality individuals	B	A	A	A
		Identify more suitable genotypes	A	A	B	B
		Plant genetically modified species	B	B	D	D
		Match provenances to new site conditions	A	A	A	A
		Adjust the natural disturbance regime to forest processes to maintain an equilibrium state, as possible	A	A	A	A

guidance on What to do is available, but what about...

Adaptation Options



WHO is
going to do it?

WHO
is responsible for
adaptation?

HOW?

Energy crisis

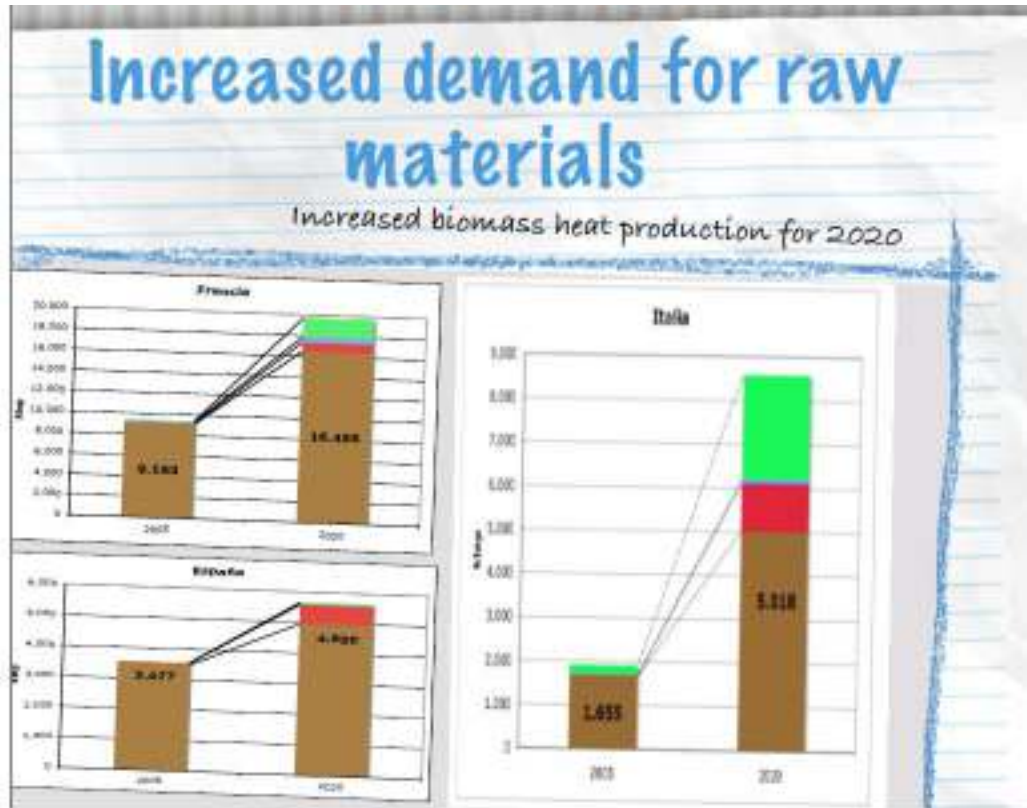
- Biomass for bioenergy

But Italy imports most of its biomass

UK is looking at global supply chains

Spain puts the focus in “energy-crops”

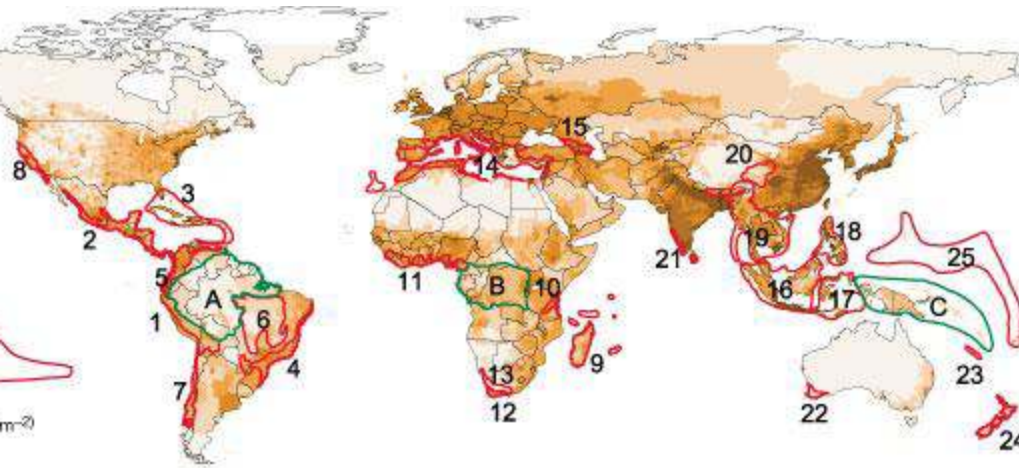
Big electricity facilities vs local heat





Forestry in across-road

- Biodiversity Conservation



Algerian nuthatch (*Sitta ledanti*)



Levallant's woodpecker (*Picus vaillantii*)

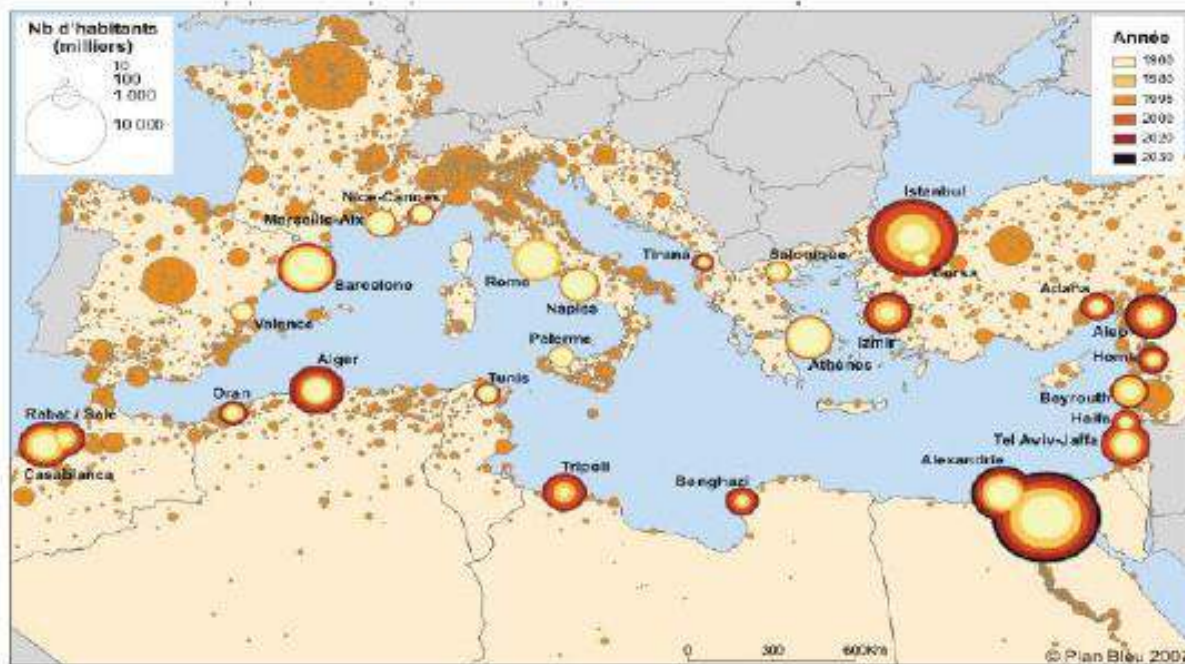




Mediterranean Forests: societal change

- High population (480 Million inhabitants)
- 66% of people lives in cities
- 30% of world tourism!!

Projected urban population by 2030



Urban populations can affect distant forests.

- demand for **wood-fuel**
- **water**, food
- waste disposal and
- **Recreation**
- **Well-being**

Myers 1994



Forest and Water a hot topic in Australia

15% decline in precipitation = 85% decline in watershed output

Wester Australia (Perth)

1970s:

- 80% surface water
- 20% underground water

2010s:

- 5% surface water
- 60% underground water
- 35% desalination



Forest and Water a hot topic in Australia

Managing forest for water could increase watershed output and produce revenues of AUS\$ 1.000 based on price of water... but...

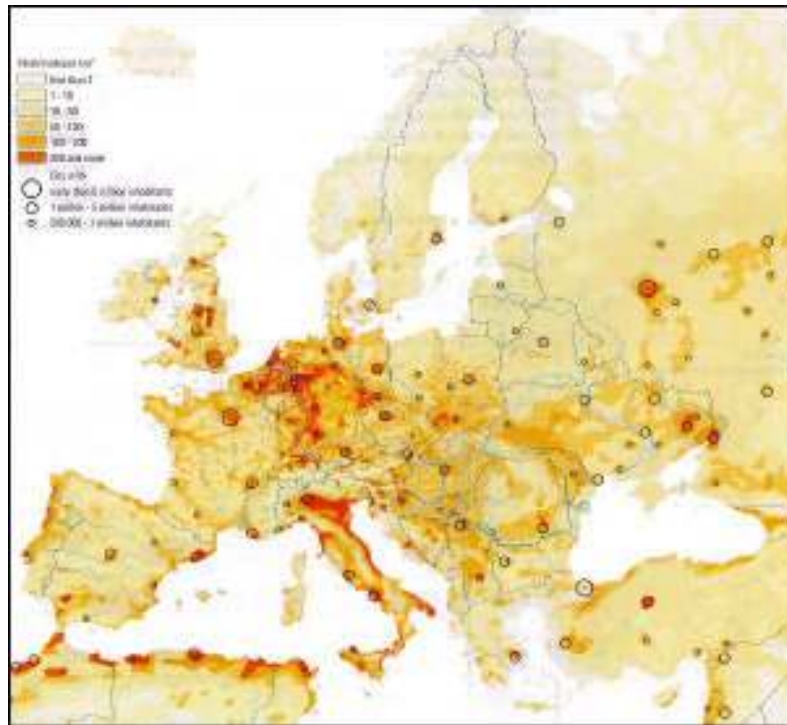


Mediterranean Forests: human pressure

Rural abandonment in the north

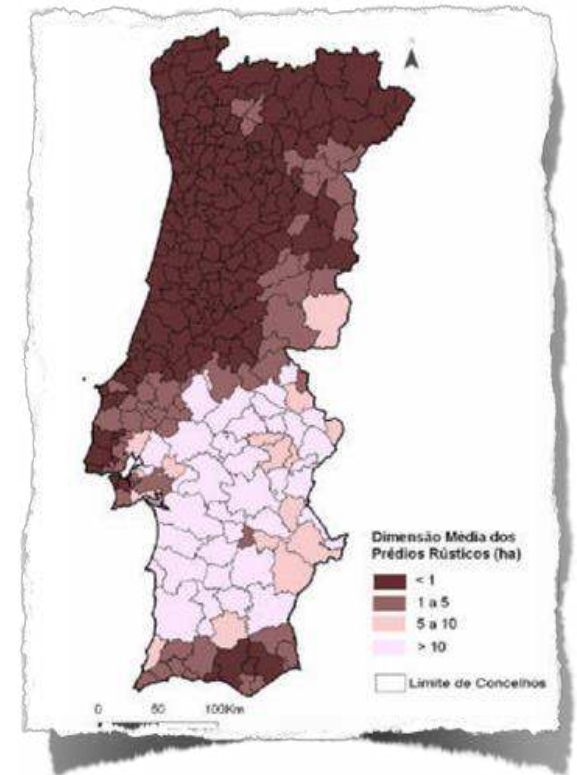
Growing rural populations in the south

Urbanization everywhere





Mediterranean Forests: Fragmentation



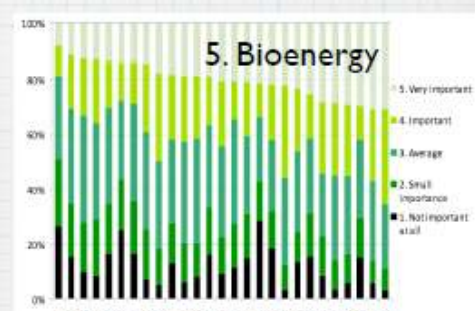
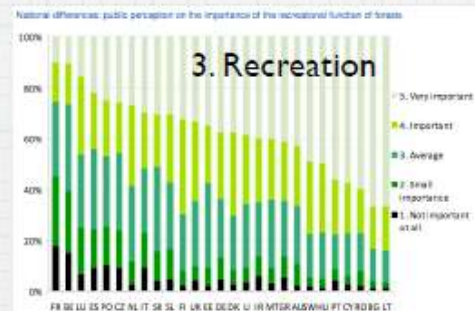
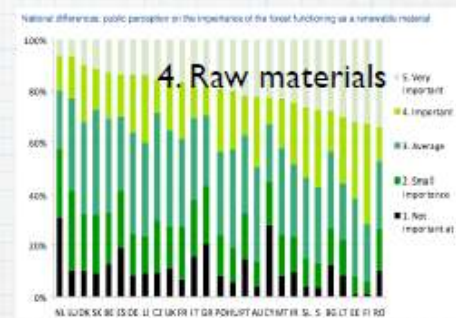
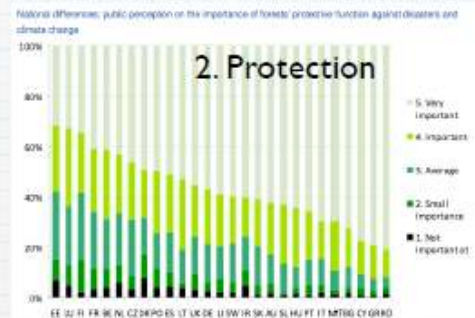
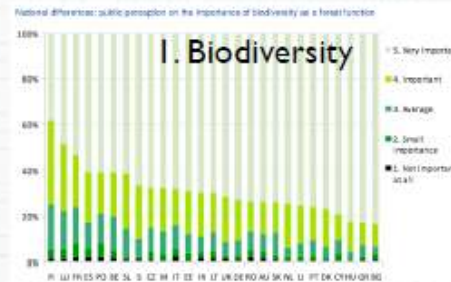
Castilla and Leon
1.000.000 owned by 700.000 thousen
owners

Forestry in the cross-roads: social values

Social Change

* Society favors environmental services

Forest should be managed for...



license to operate,

license to PES

Consume behaviour



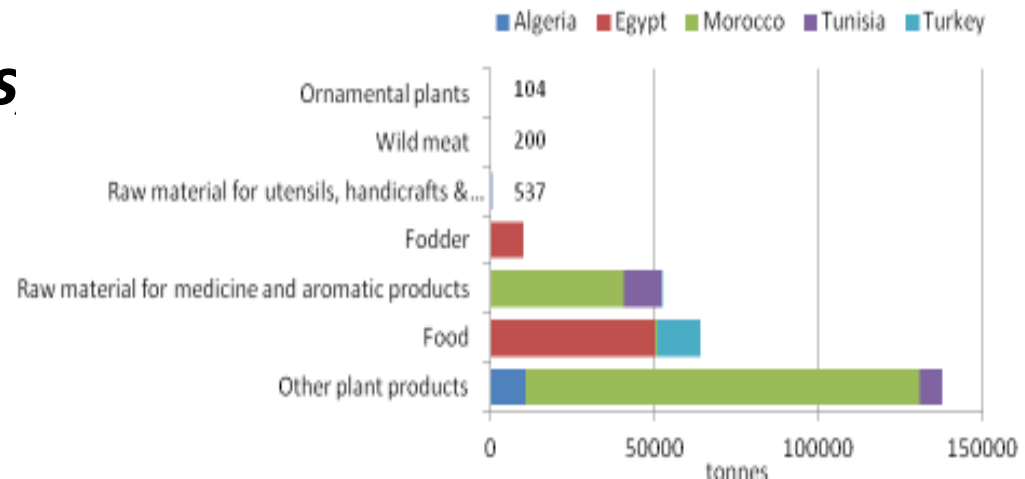
Message 2:

In a context of increased demand for forest goods, pressure on profitability is increasing

No-Management in the North, leading to megafires

Pressures to land use change and degradation in the South

Despite their high values mediterranean forests are a sink of public resources





Message 3

As forests become more relevant to different policy sectors, forest governance gets increasingly weaker

Influenced by multiple sectorial policies

Lack of holistic, shared vision

Int. arena an example

UNFCCC / CBD / UNFCD





A “new” way to develop knowledge

Increase the co-generation of legitimate, relevant, timely, useful, applicable knowledge.

*Increasing the science-policy-practice dialogue to answer **what**, **who** and **how***

SCIENCE POLICY
EXCHANGE > Science from Ideas to Impact





Innovating to create value

Change in mind setting: Mediterranean forests a source of richness:

- *from trade-offs to synergies*
- *From the Stand to forested landscapes*

Generating and connecting Value chains

on Wood and NWFPs
on Ecosystem Services

Engaging with local actors (defining and implementing SFM fuel reduction through grazing / NWFP...)

Creating cross-sectoral dialogue

Water, Energy, tourism





FORESTERRA

Enhancing FORest REsearch in the MediTERRanean
through improved coordination and integration



Thanks for your input