The background of the slide is a photograph of a landscape fire. In the foreground, there are charred, blackened tree trunks and branches. In the middle ground, a line of orange and yellow flames is visible against a blue sky. The overall scene depicts the aftermath of a fire in a rural or agricultural area.

# Changes in landscape fire-hazard during the second half of the 20th century: Agriculture abandonment and the changing role of driving factors

Olga Viedma , Nicolás Moity , José M. Moreno

**12.08.2015**

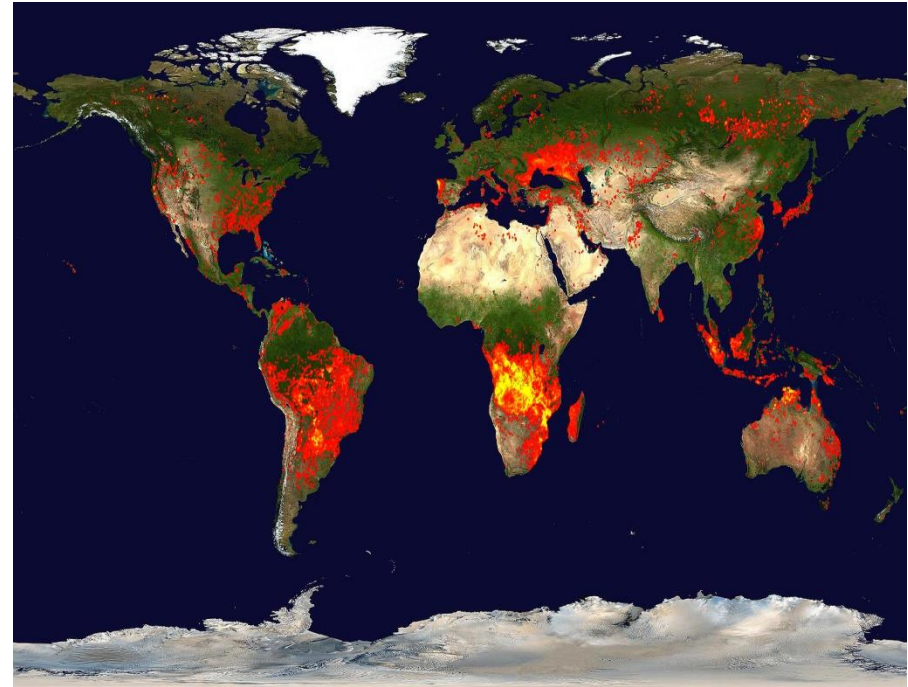
Por  
**Eufrásio Nhongo**

# 1. Introdução

Os incêndios são uma das mais importantes fontes de danos: ambientais, económicos e sócias em varias regiões do mundo.



Fonte: Agrinit, 2010



Fonte: johnson, 2000

O aumento de áreas queimadas, aumentaram marcadamente durante a segunda metade do século passado em muitas partes do mundo (FAO 2001 ; . Bowman et al , 2009) .

No mediterrane a incidencia ocorreu durante o início da década de 1970, mas não tanto no Norte de África, indicando que factores socio-econômico foram os que determinaram a sua mudança.

Factores associados a incidencia de queimadas no mediterraneo:

- Mudanças de Uso e Cobertura de terra.
- Factores ambientais e socio-economicos.
- Factores climaticos.

Factores que determinam a mudança de uso e cobertura de terra é pouco conhecida.

O Papel estacionário do ambiente e fatores sócio-econômicos para explicar mudanças UCT, principalmente o abandono da agricultura, tem sido questionada sugerindo que as relações entre áreas de cultivo e as condições ambientais bem como o papel dos fatores sócio-econômicos estejam interligados.

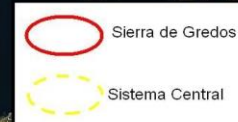
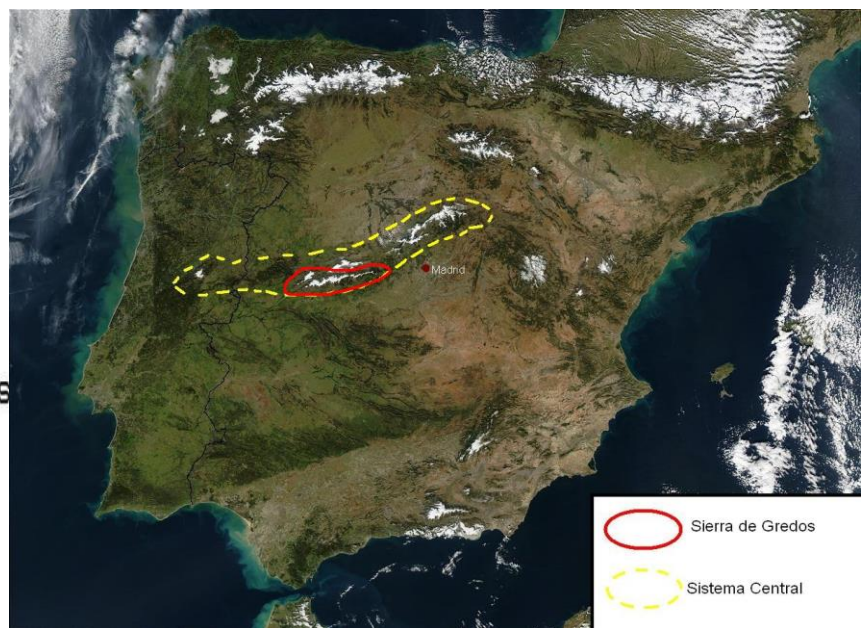
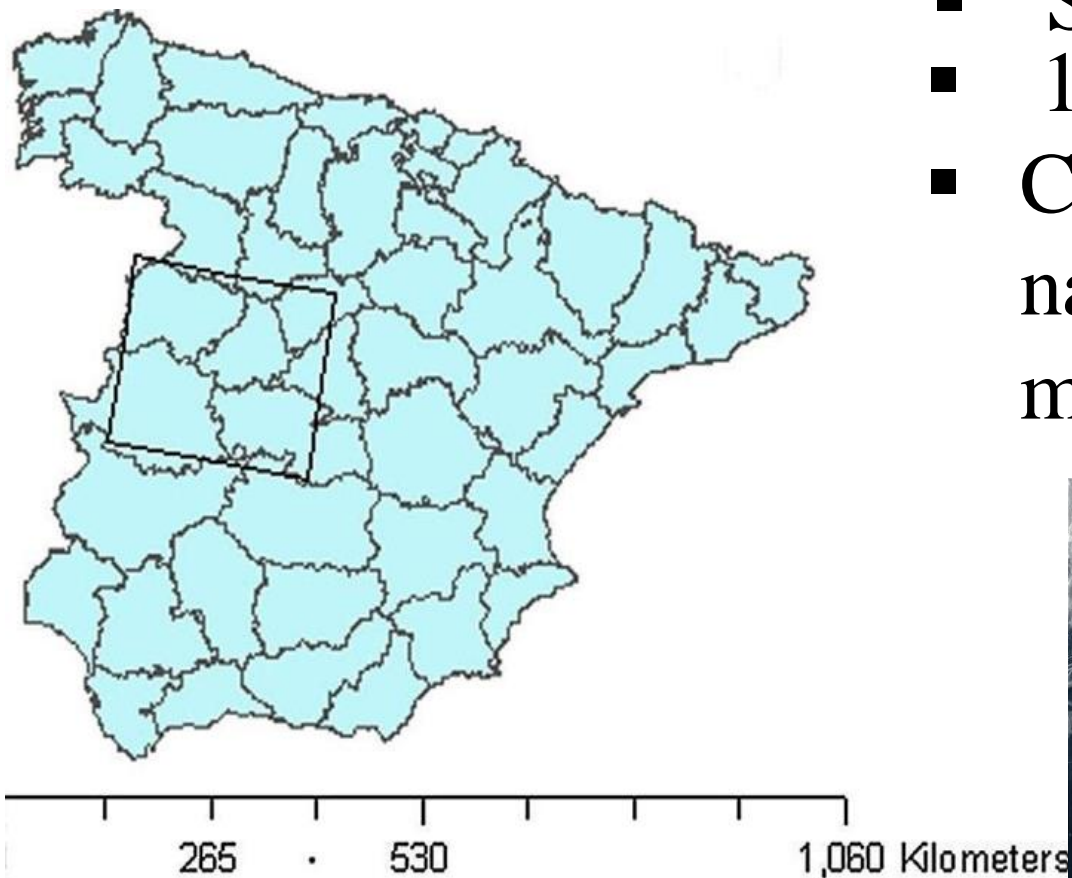
# 1.1 Objectivo

Analisar os factores da mudança da paisagem do perigo de incendio durante a segunda metade do século 20, no central oeste da Espanha, entre os anos de, 1950–2000.

## 2. Material e Metodo

### 2.1. Área de estudo

- Superfície 4.594 km<sup>2</sup>
- 155 731 habitantes
- Clima ameno e úmido nas planícies, frio e molhado nas montanhas



Fonte: Viedma et al., 2015

# 2.2. Materiais

## 2.2.1. Dados

Explanatory variables	Source	Spatial resolution	Dates
Level 1 (grid cell)			
Elevation (m)	Digital elevation model (IGN)	5 m	
Slope angle (°)			
Topographic wetness index			
Solar radiation ( $\text{kW m}^{-2}$ )			
Curvature			
Landforms			
Mean annual precipitation (mm)			
Average minimum annual temperature (°C)			
Average maximum annual temperature (°C)			
Distance to roads (km)	Roads map (IGN)	100 m	
Cost distance to villages	Villages map (IGN)		
Level 2 (soil polygons)			
Soil types	European soil database (ESDB)	1 × 1 km	
Parent material			
Soil depth			
Erosion			
Stoniness			
Level 3 (municipality)			
Population density (inhabitants/ $\text{km}^2$ )	Spanish population register (INE)		From 1900 (yearly)
Unemployed people (%)	Unemployment statistics (SEPE)		From 1983 (yearly)
Employees in economic sectors	Spanish population census (INE)		From 1981 (at each 10 years)
Farms density ( $\text{n}^\circ/\text{km}^2$ )	Spanish agrarian census (INE)		From 1962 (at each 10 years)
Farms by land tenure (%)			
Farms by size (%)			
Full-time farmers (%)			
Agrarian holders older than 55 years (%)			
Machine density ( $\text{n}^\circ/\text{km}^2$ )			
Livestock density ( $\text{n}^\circ/\text{km}^2$ )			
Land use–Land cover percentage	IGN, CORINE land cover (EEA)	100 m	1950s, 1978, 1986 and 2000

Figura 1: Dados utilizado , INE, IGN

## 2.2.2. Aplicativo Computacional

❑ **ArcGis 9.3.1**

❑ **R**-é uma linguagem e um ambiente de desenvolvimento integrado, para cálculos estatísticos e gráficos.

✓ **Akima**-Pacote que serve para interpolação de dado.

✓ **Reldist**- Pacote para estatística

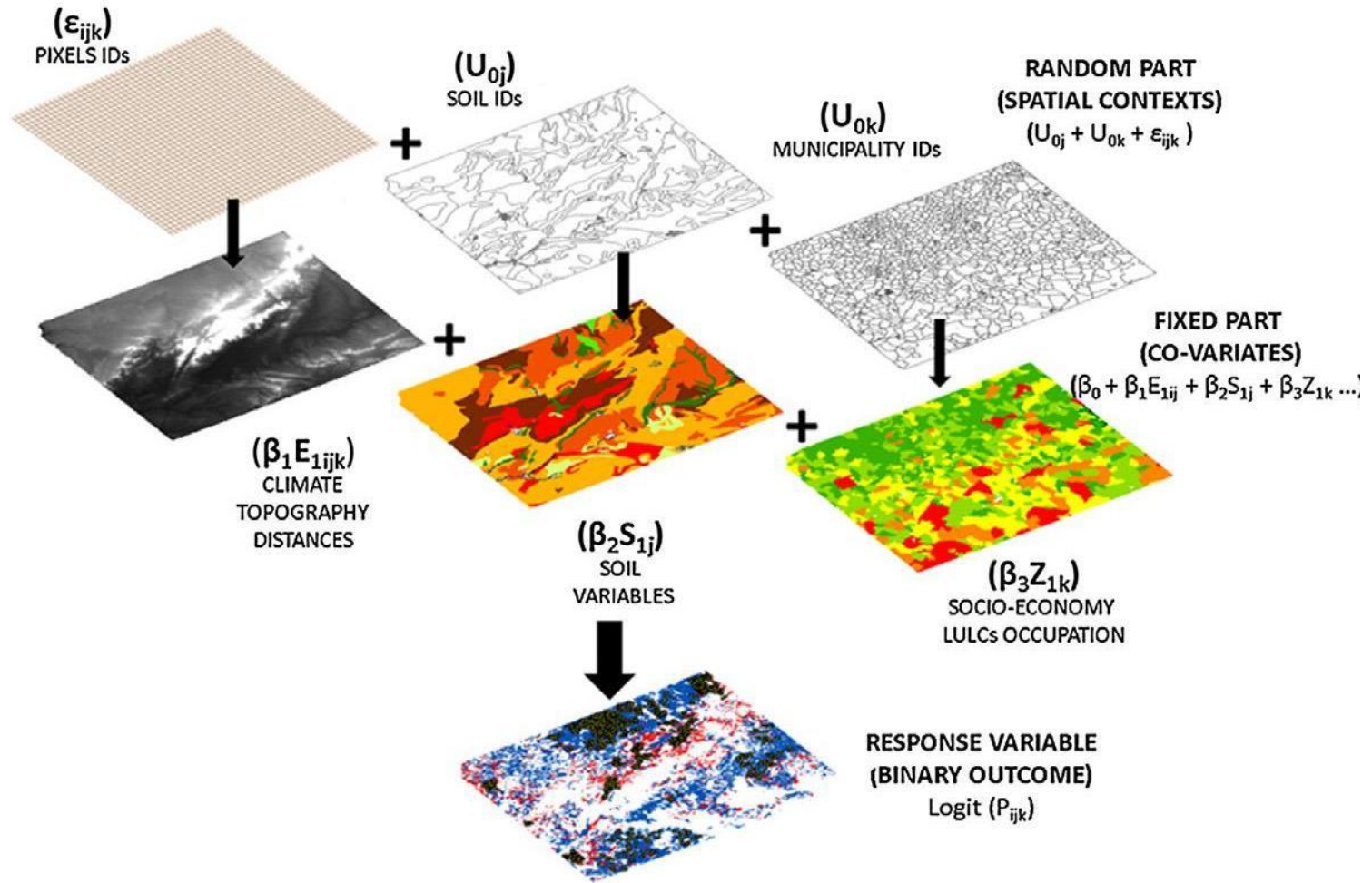
✓ **Spsurvey**

✓ **lme 4.0**

✓ **Raster**



## 2.3. Metodo

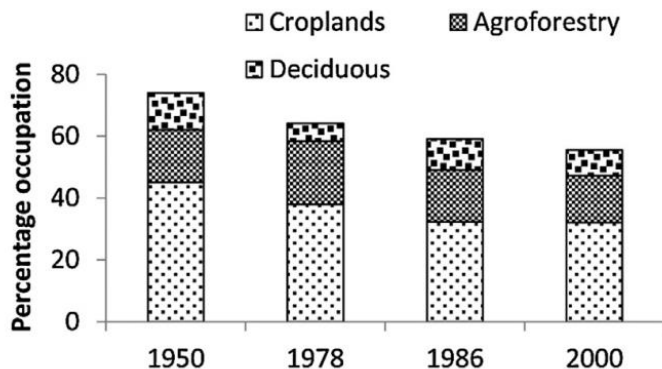


$$\text{Logit}(P_{ijk}) = \beta_0 + \beta_1 E_{1ijk} + \beta_2 S_{1j} + \beta_3 Z_{1k} + U_{0j} + U_{0k} + \epsilon_{ijk}$$

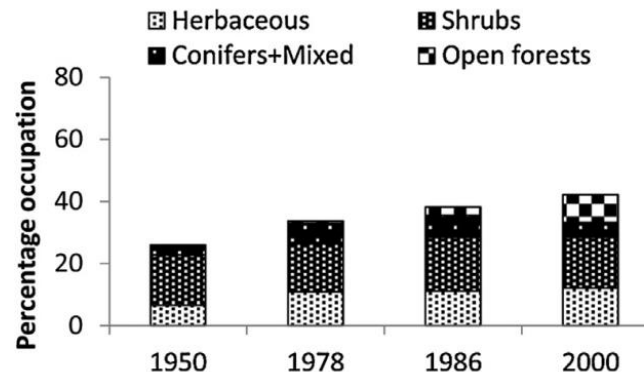
# 3. Resultado e Discussão

## 3.1. Tendências de Uso e Cobertura

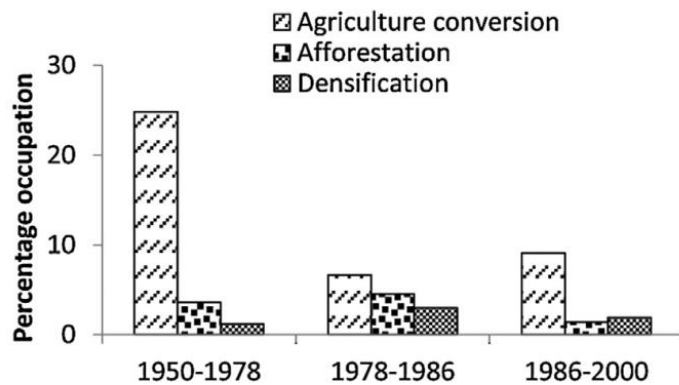
A) Non hazardous LULCs



C) Hazardous LULCs



B) Non hazardous LULC Changes



D) Hazardous LULC Changes

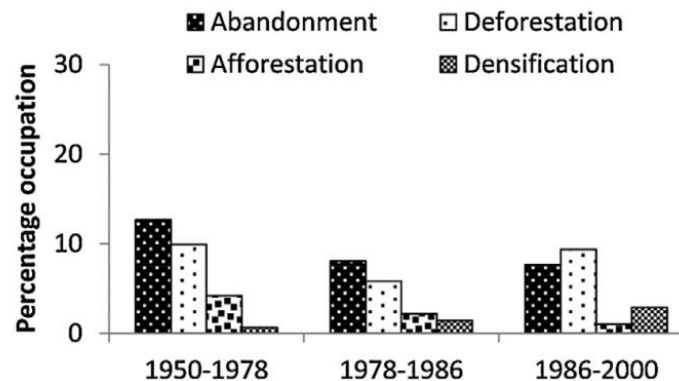
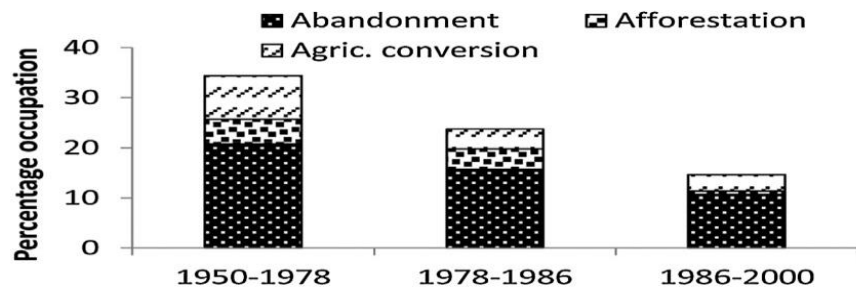
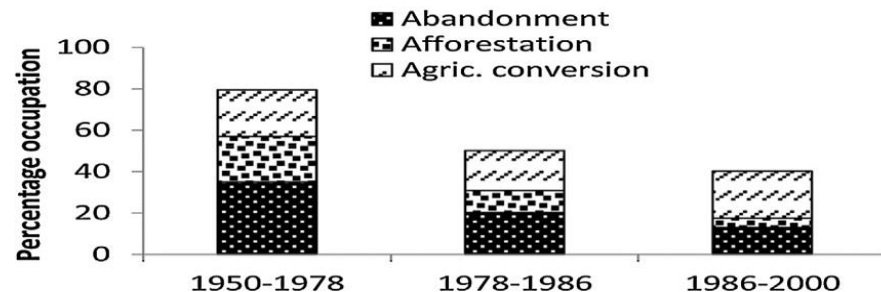


Fig. 1. Percentage de ocupação de LULC não perigoso (A), Mudanças de LULC não perigo (B), LULC Perigoso (C), Mudanças de LULC Perigoso (D)

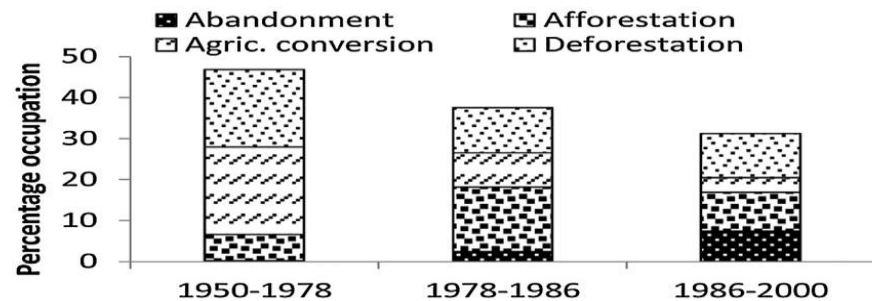
A) Agriculture areas



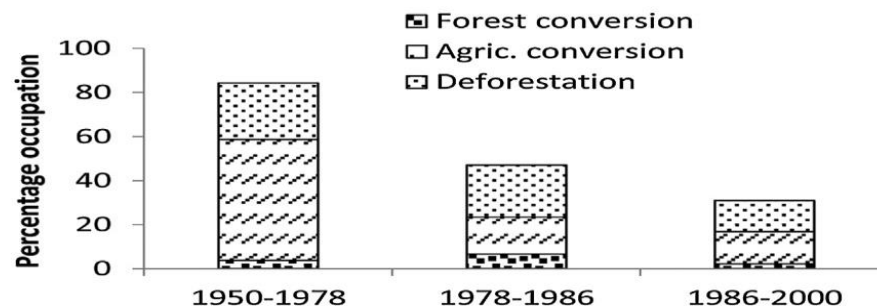
B) Pastures



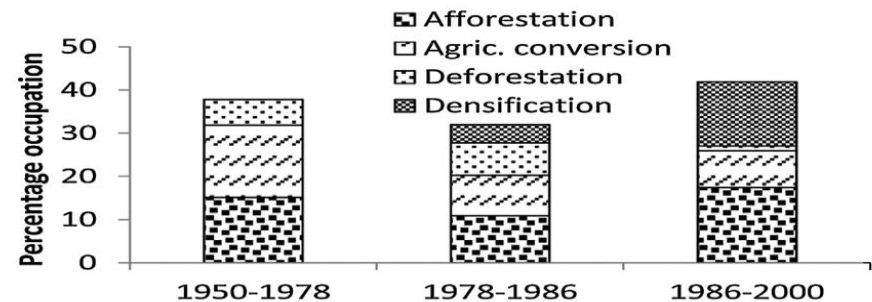
C) Agroforestry areas



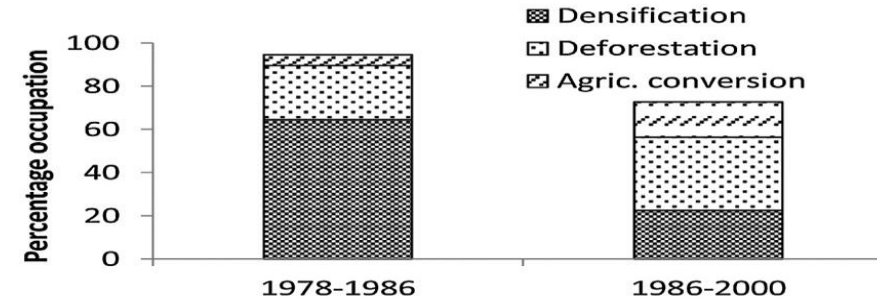
D) Deciduous forests



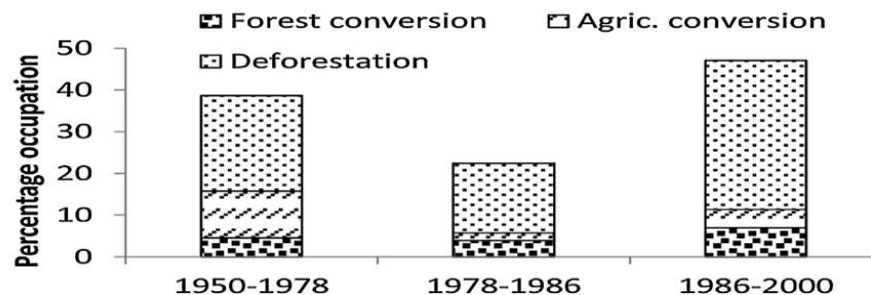
E) Shrublands



F) Open forests



G) Hazardous forests



# 3.2. Mudanças variáveis Socio-económicas

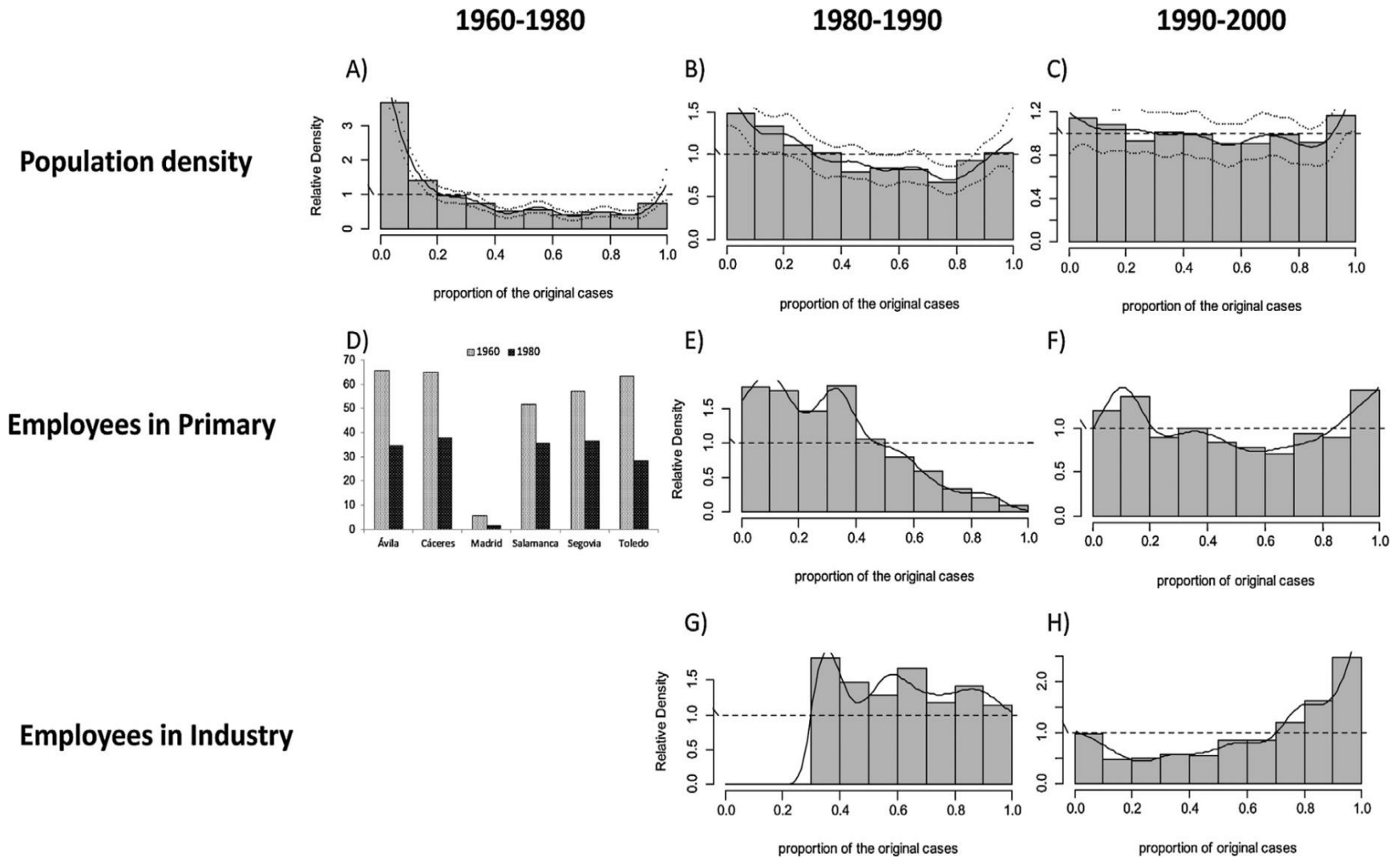
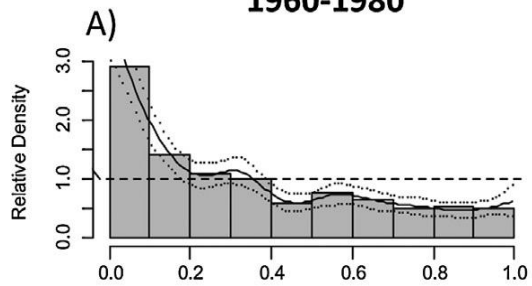
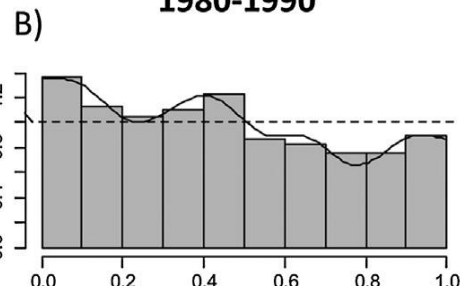
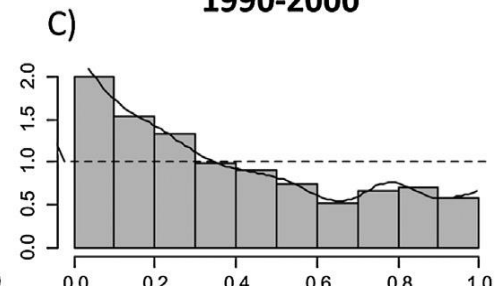
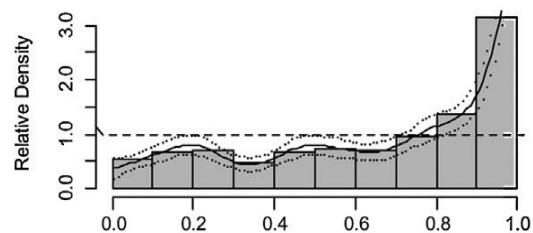
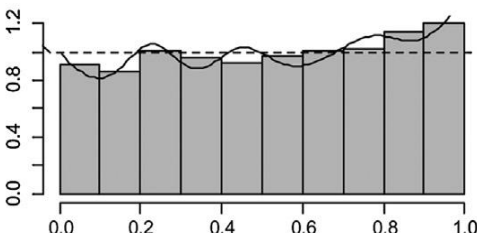
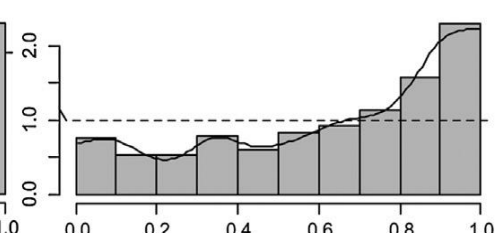
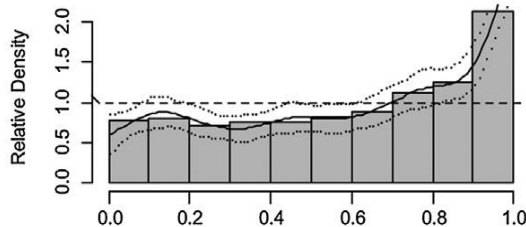
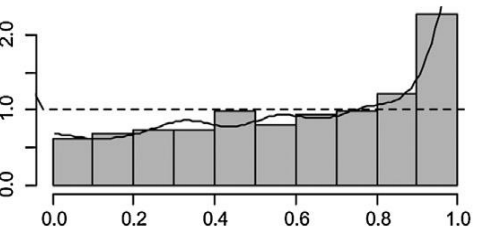
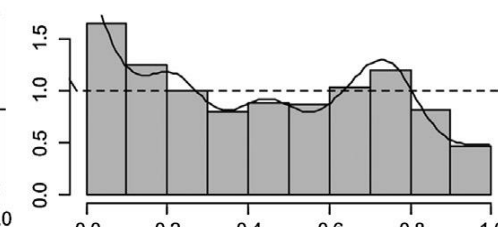
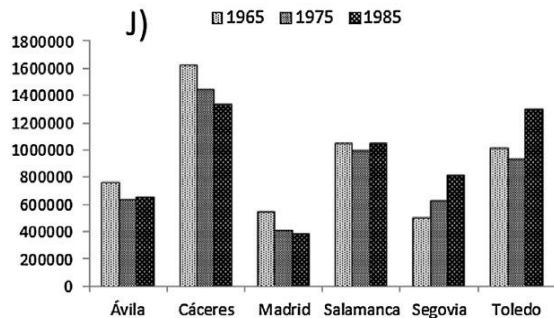
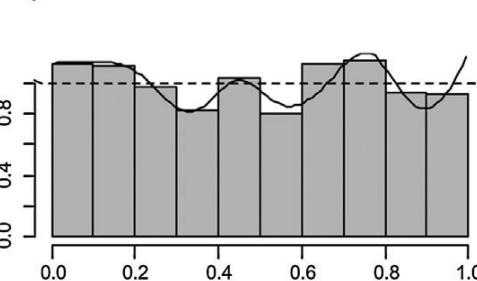
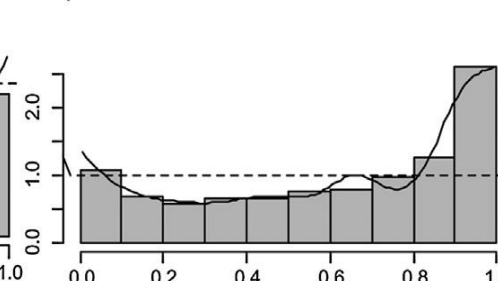


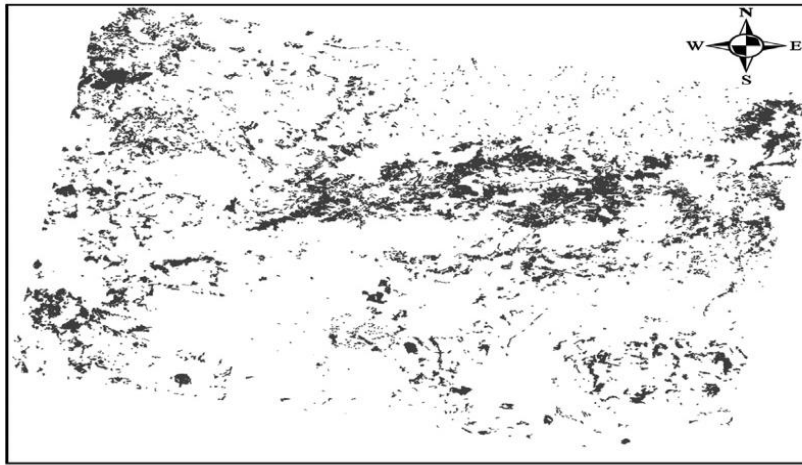
Fig. 5. Comparação de variáveis socio-económicas (1960–1980, 1980–1990 e 1990–2000).

**1960-1980****1980-1990****1990-2000****Farms density****D)****E)****F)****Farms > 50 ha****G)****H)****I)****Holders > 55 years****J)****Livestock****K)****L)**

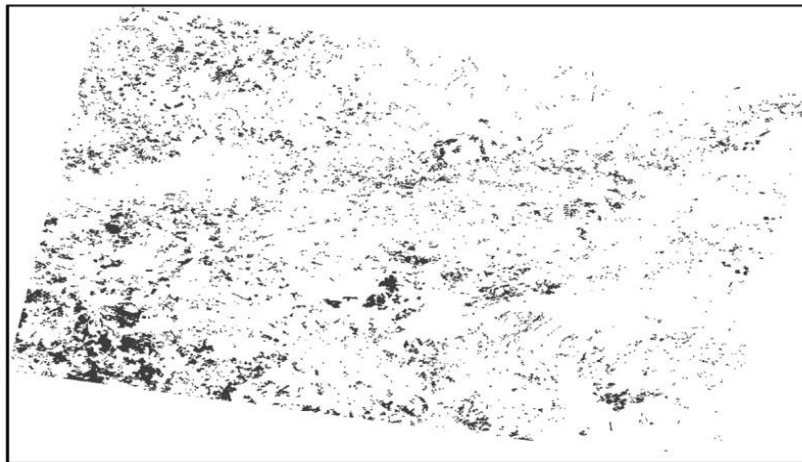
# 3.3. Modelagem da agricultura de 1950-2000

A) Land abandonment (1950s-1978)

B) Land abandonment (1978-1986)



C) Land abandonment (1986-2000)



0 70 140 210 280 Kilometers

Fig. 7. Mapa Binario: 1950s-1978 (A), 1978-1986 (B) and 1986-2000 (C).

## 4. Conclusão

- ❑ As mudanças que no Uso e cobertura de terra a partir de 1950 a 2000 aumentou globalmente o perigo de incendio na área de estudo.
- ❑ Houve um aumento de areas queimadas, nas areas abandonadas pela pratica de agricultura, sobretudo a partir dos anos 90.
- ❑ As variaveis economicas, influenciara no abandono da agricultura.

- ❑ 1950-1978: Mecanização Agrícola
- ❑ 1978-1986: Mecanização Agrícola e Mudanças Socio-Economicas (Emigração de areas agrícolas e crise Economica)
- ❑ 1986-2000: CEE-Comunidade Economica Europeia



# **Crítica ao artigo**

- ❑ Delimitação da área de estudo.**
- ❑ Aquisição de dados socio-econômico.**
- ❑ Influência das variáveis Climáticas.**
- ❑ Metodologia difícil de compressão.**

# 5. Bibliografia

- Hatna, E., Bakker, M.M., 2011. Abandonment and expansion of arable land in Europe. *Ecosystems* 14, 720–731.
- González, J., Palahi, M., Pukkala, T., 2005. Integrating fire risk considerations in forest management planning in Spain – a landscape level perspective. *Landscape Ecol.* 20, 957–970.
- Rego, F.C., 1992. Land use changes and wildfires. In: Teller, A., Mathy, P., Jeffers, J.N.R. (Eds.), *Responses of Forest Ecosystems to Environmental Changes*, 766–767. Springer, Dordrecht, The Netherlands, pp. 367–373.

- Romero-Calcerrada, R., Perry, G.L.W., 2004. The role of agriculture abandonment in landscape dynamics in the SPA 'Encinares del rio Alberche y Cofio, Central Spain,

A photograph of a large fire burning in a forest. The fire is intense, with bright orange and yellow flames rising from the ground and consuming the trees. The smoke is thick and dark. The word "OBRIGADO" is overlaid in white text in the center of the image.

OBRIGADO