ECO.FIRE

The economic value of forest fires as support for prevention behavior

OBJECTIVES

The forest fire impacts are being accounted for using simplified methodologies, only including costs of losses in goods and services, which undermines correct management of forest areas for future fire prevention.

Challenge 1

Identify all fire resulting losses

Challenge 2

Assign a market and non-market value to all losses

Challenge 3

Involve citizens in the valuation process, aiding prevention actions

To contribute to the fulfilment of national and international commitments to reduce greenhouse gas emissions, Paris Agreement and “Roadmap for Carbon Neutrality by 2050” which includes trajectories for forestry, and land use.

Methodology

Adding to the current direct and indirect accounting of forest fire impacts, namely, the costs of goods and services lost, and the costs of carbon sinks losing, this project resorts to non-market valuation methods to explore the value of assets related to forest resources that can be lost through forest fires. Also, we design an economics experiment, which testbeds mechanisms to contribute to the prevention of forest fires.

Activities

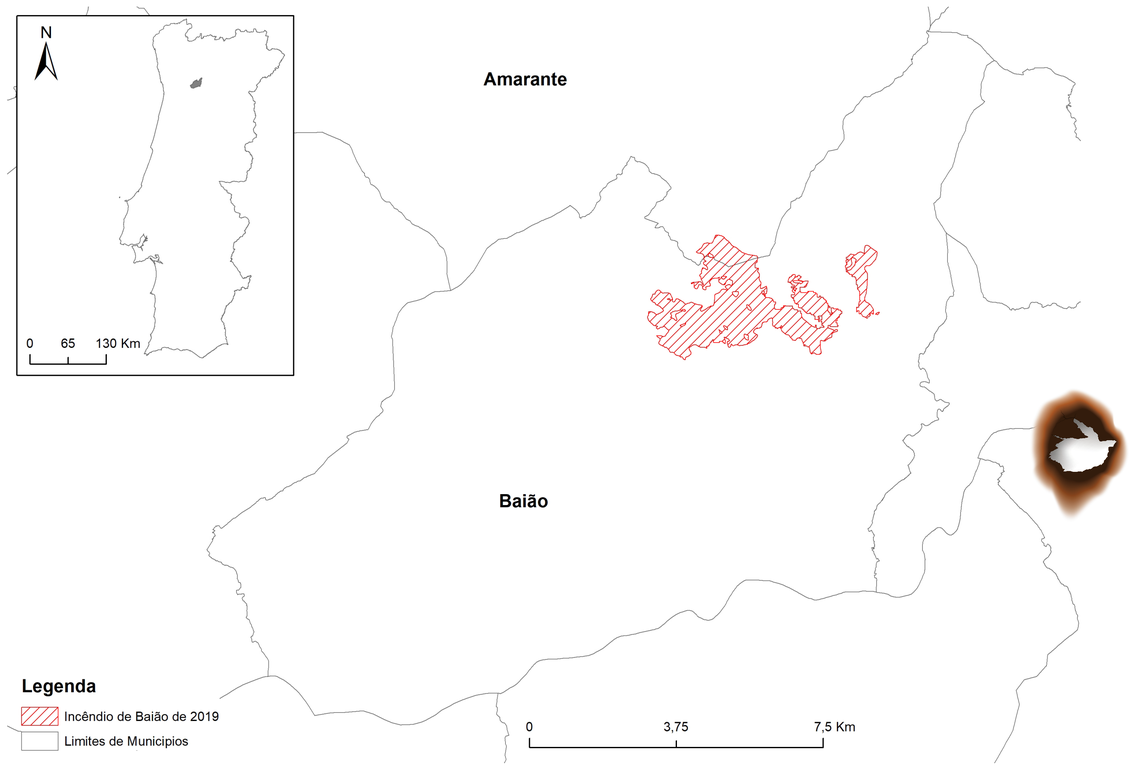
a) Mapping tools for identifying critical areas in terms of economic losses and environmental impacts (CAEL - Critical Areas in terms of Economic Losses)
b) Discrete choice experiment (DCE) based on a mixed methods approach
c) Questionnaire to elicit whether participants’ opinions and behaviours towards forest management issues changed by having participated in the DCE;
d) Economic experiment to test different mechanisms to crowd-source geographically relevant information for forest fire prevention, engaging citizens in forest management activities.

Crowdsourcing

To improve mapping of the territory by neighbours, local communities, visitors or passers-by. Also, there is scope for crowd-sourcing data on real-time adverse conditions as to the state of cleanliness, dryness of weather conditions, and others.
Crowdsourcing depends on individuals’ acceptance of the technology and willingness to participate.
The economics experiment will test how to implement such a crowd-sourced data collection system and explore the incentives for participants in such a scheme. The benefits of this system generate a public good in terms of wildfire prevention.

Background

In Portugal the natural cycle of fire has been reduced, fires have become recurrent, their intensity and expansion have increased, and they have taken on catastrophic proportions. This reality has triggered new discussions on the theme of forest management and the consequences of international commitments to reduce greenhouse gas emissions.



RESULTS

An economic evaluation of the damages and impacts of forest fire:

With the social costs,the direct use values, indirect use values, option values and existence values.

A methodology for the identification of areas affected by forest fires, and disclosing mechanisms to crowd-source geographically relevant information for forest fire prevention:

Requires the economic assessment of the damage and impacts of active forest management, through economic experiments.

A mobile application to assess and calculate the fire damages:

Economic and environmental, providing quick prevention indications.

Final outcome:

To make the territory more resilient to fires and allow for more effective firefighting.

Team

Environmental economists, experimental economists, geographers, experts in land-use planning and forest fires, and information and communication systems experts.

This paper is financed by National Funds of the FCT – Portuguese Foundation for Science and Technology within the project Ref: PCIF/AGT/0153/2018 | Jan. 2020 > Jan. 2022

1NIPE, EEG, UMinho | 2CEGOT, ICS, UMinho | 3CCG

Authors: L. Pinto (IR)[1], R. Sousa (co-IR)[1], J. Cerejeira[1], M. Valente[1], A. Bento-Gonçalves[2], A. Vieira[2], F. Meneses[3], J. Moutinho[3]

Universidade do Minho

FCT Fundação para a Ciência e a Tecnologia