What is deciding pasture abandonment in mountain landscapes – a fuzzy cognitive model applied to Serra da Estrela, Portugal

Catarina Esgalhado, Maria Rivera, Teresa Pinto-Correia & Stefano Targetti

IUFRO DIV 8
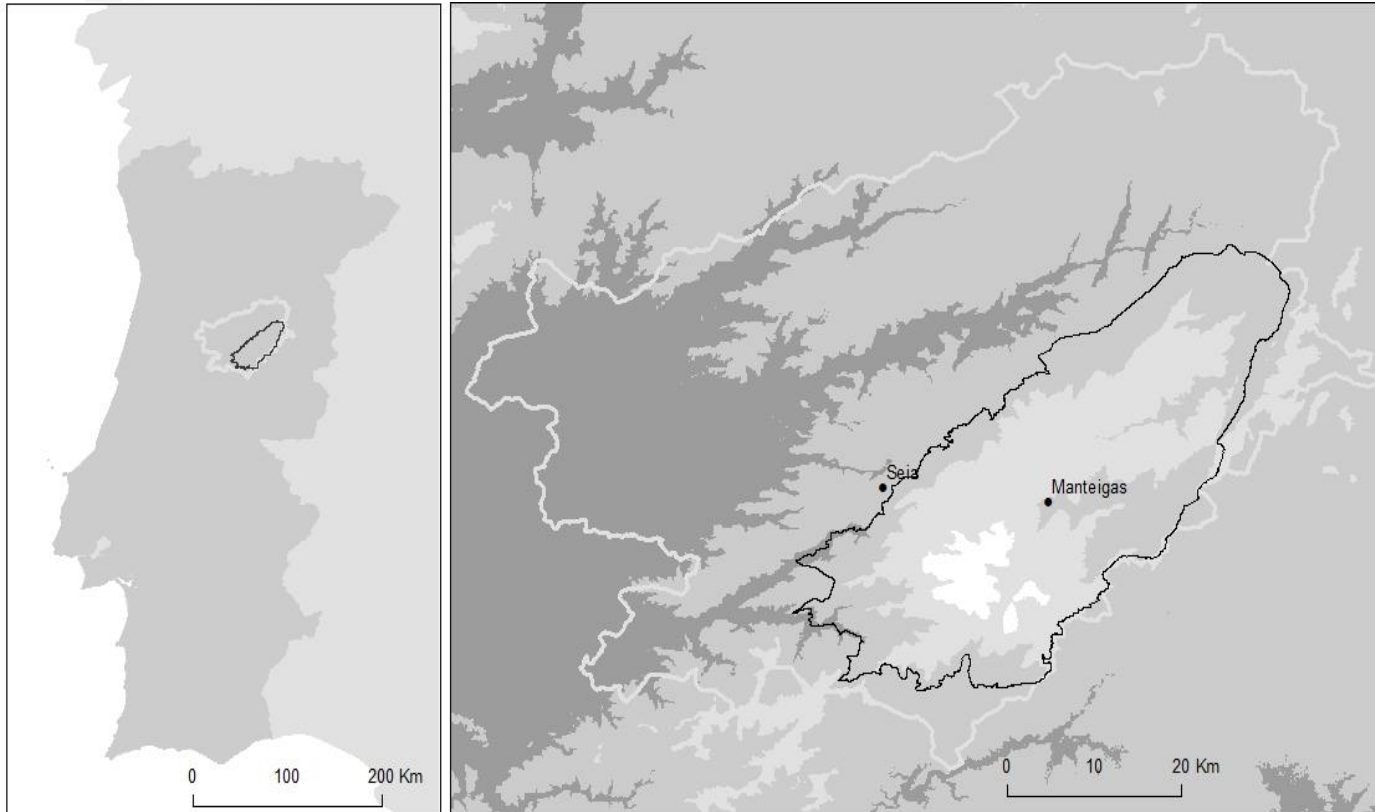
Évora, 2023

Introduction

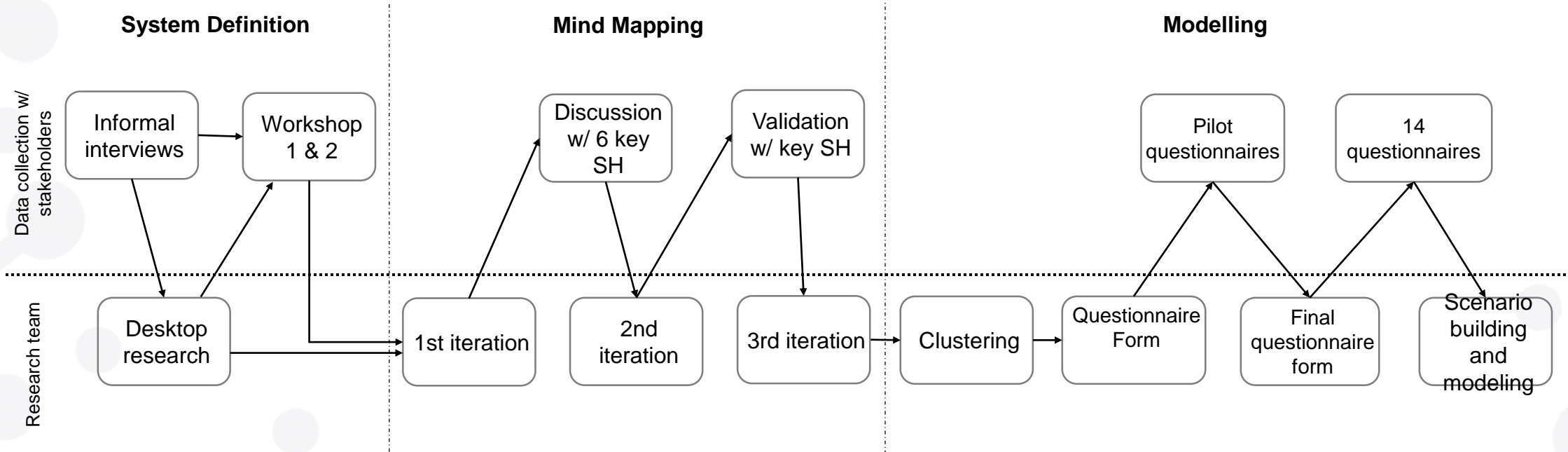Pastoral systems maintain open areas in forested landscapes

Biomass accumulation contributes to increase the fire connectivity and fire intensity
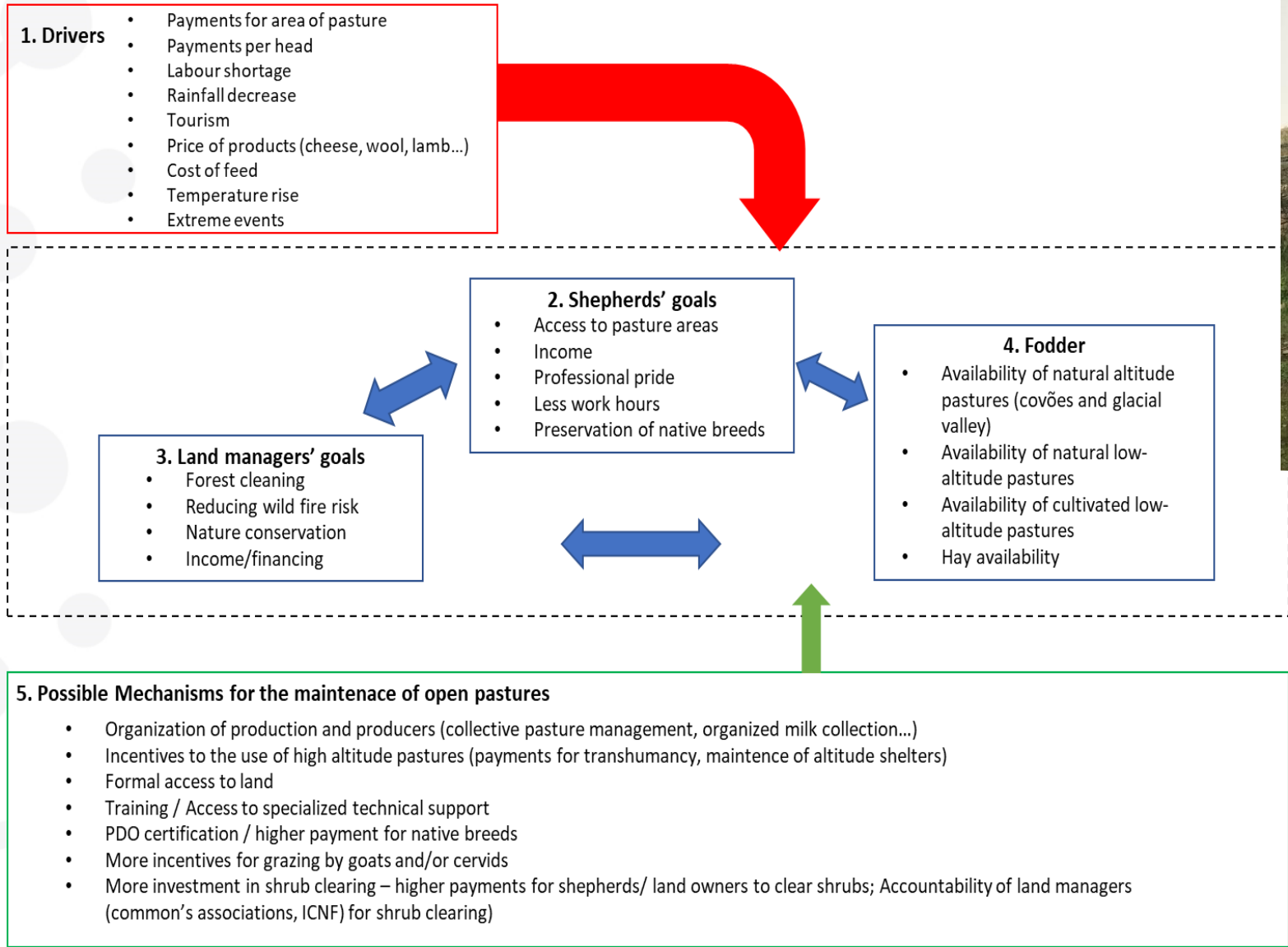
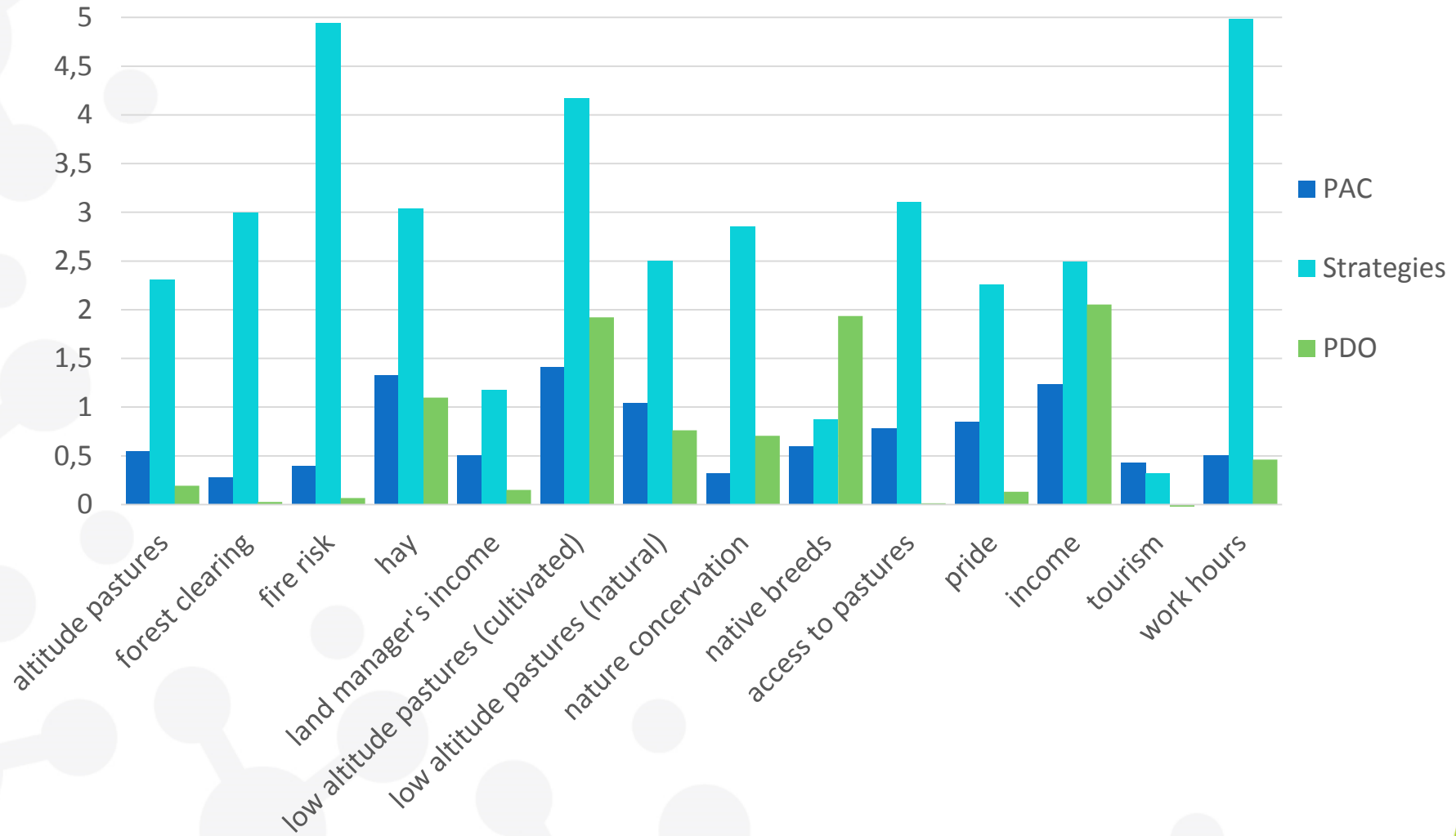Extensive grazing systems can hinder shrub encroachment and contribute to a discontinuous landscape.

@Miguel Mateus

Serra da Estrela

PNSE · PDO area · altitude (m) · 0 - 400 · 400.1 - 900 · 900.1 - 1,600 · 1,600.1 - 1,963

1. Drivers
- Payments for area of pasture
- Payments per head
- Labour shortage
- Rainfall decrease
- Tourism
- Price of products (cheese, wool, lamb…)
- Cost of feed
- Temperature rise
- Extreme events

2. Shepherds' goals
- Access to pasture areas
- Income
- Professional pride
- Less work hours
- Preservation of native breeds

4. Fodder
- Availability of natural altitude pastures (covões and glacial valley)
- Availability of natural low-altitude pastures
- Availability of cultivated low-altitude pastures
- Hay availability

3. Land managers' goals
- Forest cleaning
- Reducing wild fire risk
- Nature conservation
- Income/financing

5. Possible Mechanisms for the maintenace of open pastures
- Organization of production and producers (collective pasture management, organized milk collection…)
- Incentives to the use of high altitude pastures (payments for transhumancy, maintence of altitude shelters)
- Formal access to land
- Training / Access to specialized technical support
- PDO certification / higher payment for native breeds
- More incentives for grazing by goats and/or cervids
- More investment in shrub clearing – higher payments for shepherds/ land owners to clear shrubs; Accountability of land managers (common's associations, ICNF) for shrub clearing)

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There are no clear drivers of the system, either internal or external. Instead we have a reactive system, with seemingly little capacity of self-influencing.
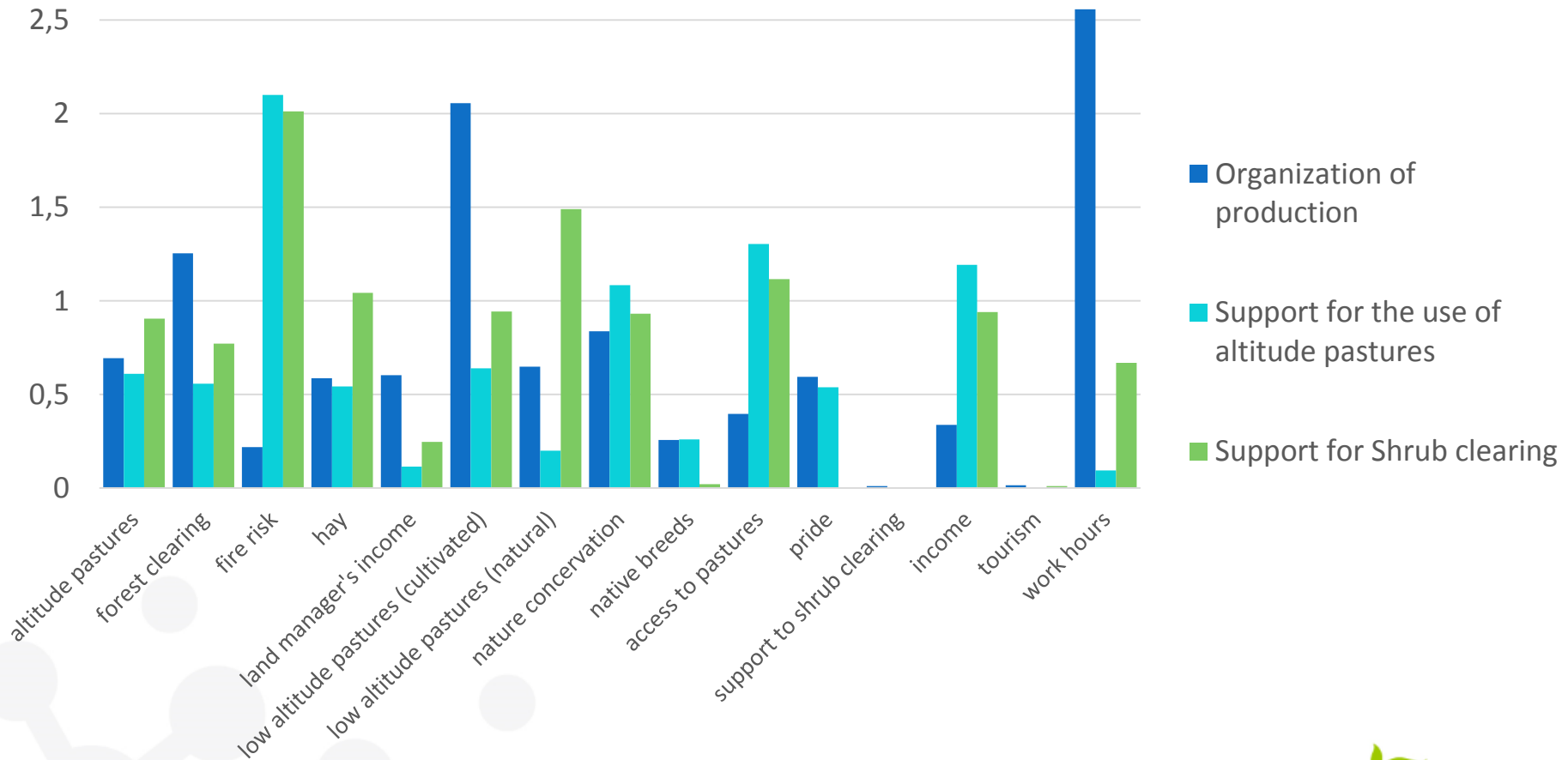
% change to the system by each scenarios

The scenario "Strategies" that can induce the most change and to the mountain landscape in particular through the use of altitude pastures, cleaning of forest and decreasing fire risk

% change to the system by each of the mechanisms from scenario 3

Individual strategies are unlikely to cause meanigful changes to the system

What is can be done to counteract pasture abandonment

Higher shepherd income is not enough

Wide área benefit the value chain, but not the connection with altitude pastures

CAP payments alone do not benefit the mountain system

Shrub clearing in paths and key areas

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