8TH INTERNATIONAL WILDLAND FIRE CONFERENCE

GOVERNANCE PRINCIPLES:

Towards an International Framework

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8TH INTERNATIONAL WILDLAND FIRE CONFERENCE

GOVERNANCE PRINCIPLES: Towards an International Framework

Social Network Analysis (SNA) and adaptive co-management to forest fires

A case study of Serra de Monchique, Portugal

TÉCNICO LISBOA

CITUA CENTRE for INNOVATION in TERRITORY, URBANISM and ARCHITECTURE

BRIDGE INVESTIGAÇÃO-AÇÃO PARTICIPADA

TRAGOF

LEGAL FRAMEWORK

Critical analysis of forest fires (FF) occurred in 2017/2018 → **systemic failures** related to the lack **of integrated management** of forests at risk

PNGIFR (RCM 45-A/2020) aims at an **integrated management of forest territories**

SGIFR (DL 82/2021) = articulated, dynamic and **collaborative actors´ network focused on FF risk reduction**

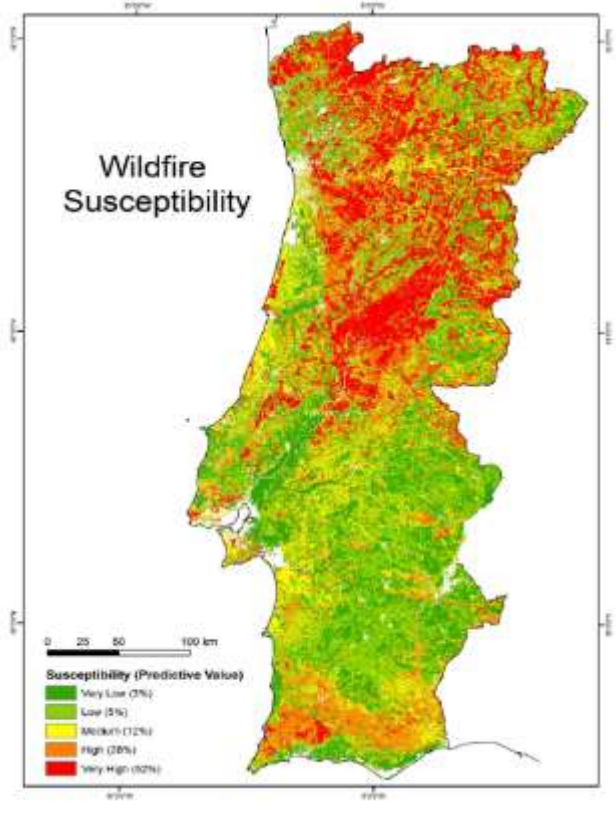

Figure 1. Susceptibility to wildfire in Portugal (Verde & Zêzere, 2010)

RESEARCH QUESTION

SNA = promising approach to analyse actors´ network in NRM

RQ: *How can an SNA approach contribute to ACoM to FF risk reduction?*

Research for the thesis **M.Sc. Territorial Planning** linked to the **BRIDGE** Project (PCIF/AGT/0072/2019) and **TRAGOF** Project (CiTUA/IST).

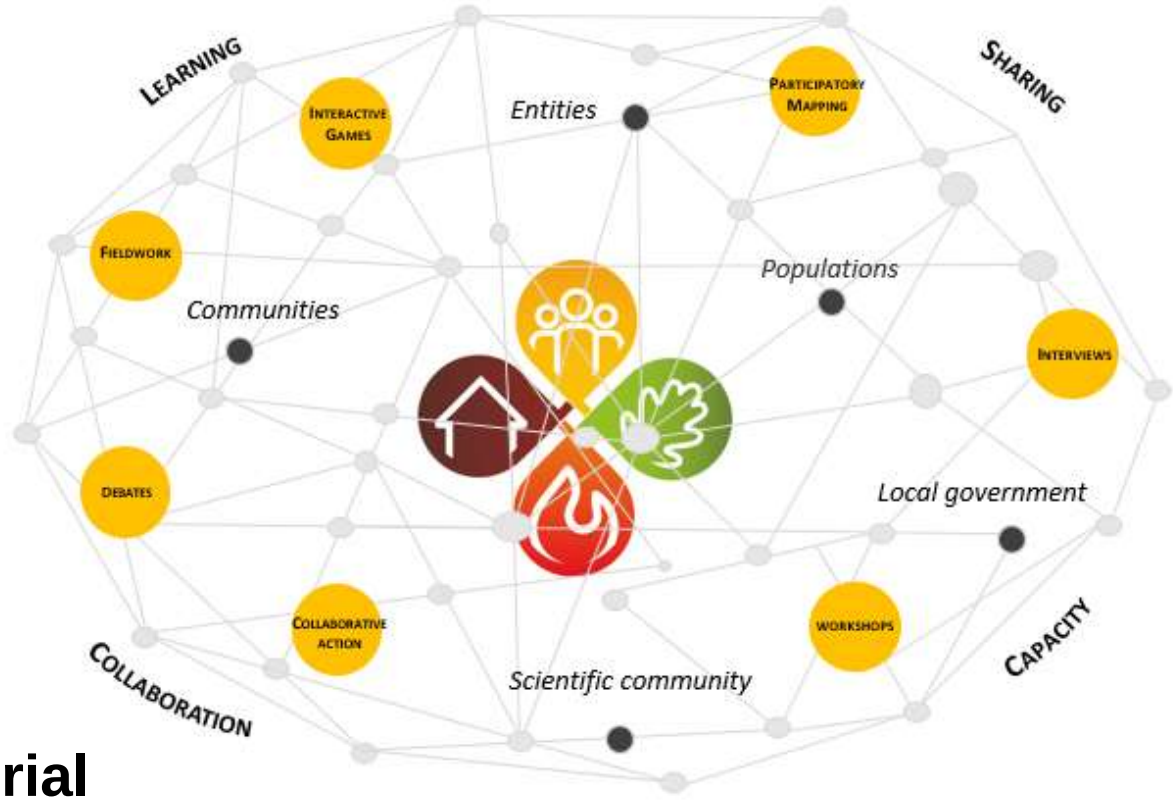

Figure 2. Bridge Project (2021/2023)

LITERATURE REVIEW - OVERVIEW

Adaptive co-management (ACoM) - approach to NRM that integrates:

- **Social learning and experimentation** in adaptive management and
- Linking functions (vertical and horizontal) and **collaborative management**

SNA - analyse **patterns of interactions** and **the position of actors within the network** in social systems (actors´ network):

- Network structure
- Dynamics of interactions and flows
- Role of the actors within the network

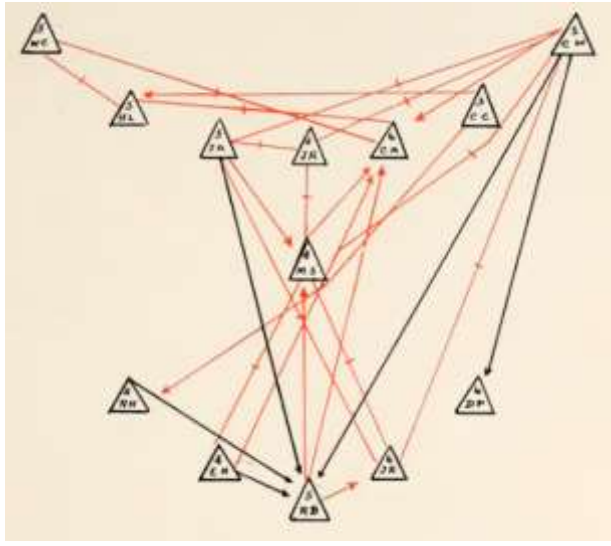

Figure 3. Sociogram of a football team (Moreno, 1934)

LITERATURE REVIEW - OVERVIEW

85 studies of SNA in NRM published between 1992 and 2017 that analyzed:

- Network structure – Cohesive (A), Centralised (B), Compartmentalised (C)
- Role of central actors within the network
- Strong interactions *versus* weak interactions
- Positive and negative effects of network aspects on NRM / ACoM

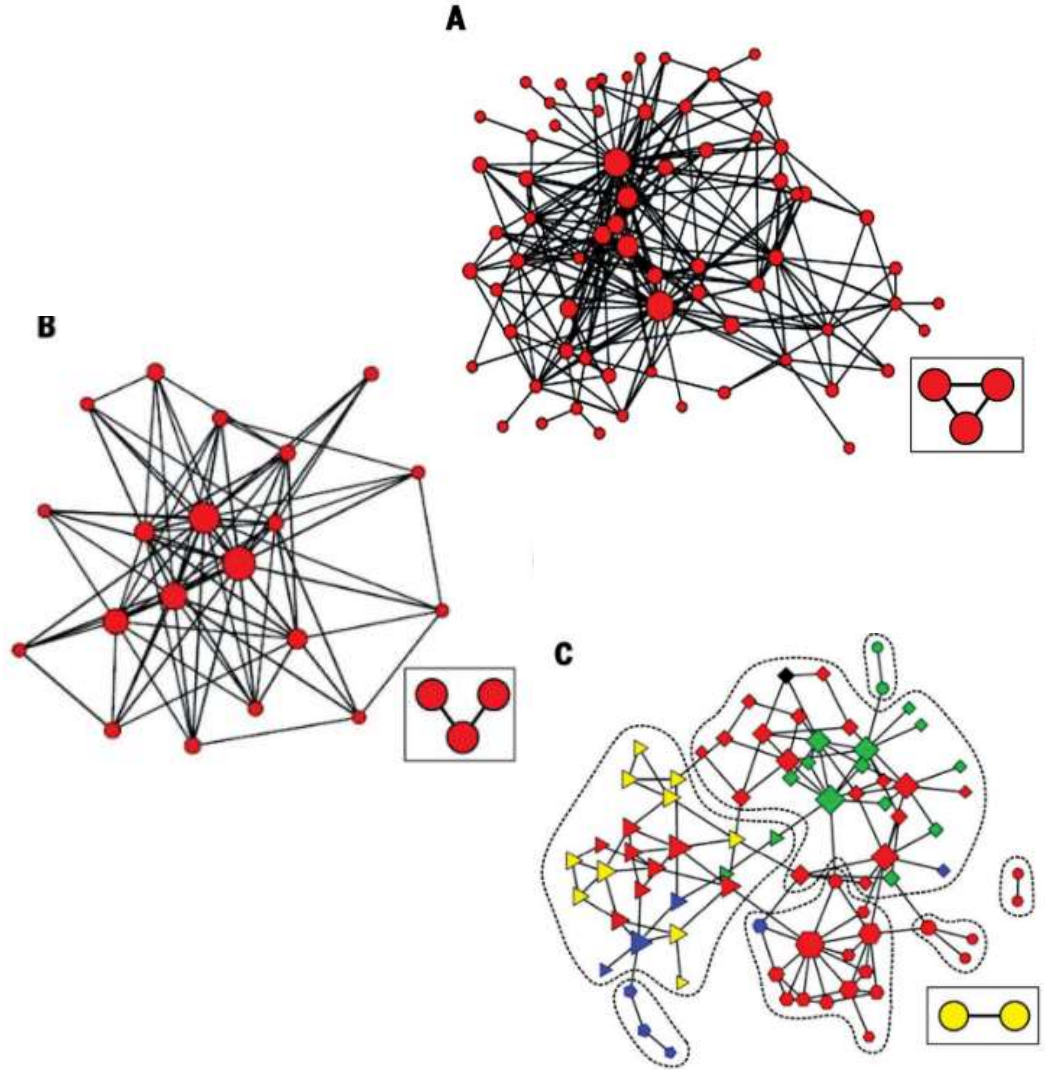

Figure 4. Types of collaborative networks in NRM (Bodin, 2017: 2)

SERRA DE MONCHIQUE (CASE STUDY)

Monchique is located in the District of Faro, southern Portugal

- Forest mass of intensive eucalyptus and pine monoculture
- Small and fragmented private forest properties
- Rural depopulation and abandonment of extensive forest assets

Severe fires: 2003 / 2018 → extensive risk areas

Classified as FF priority intervention area by ICNF (DFCI, 2021)

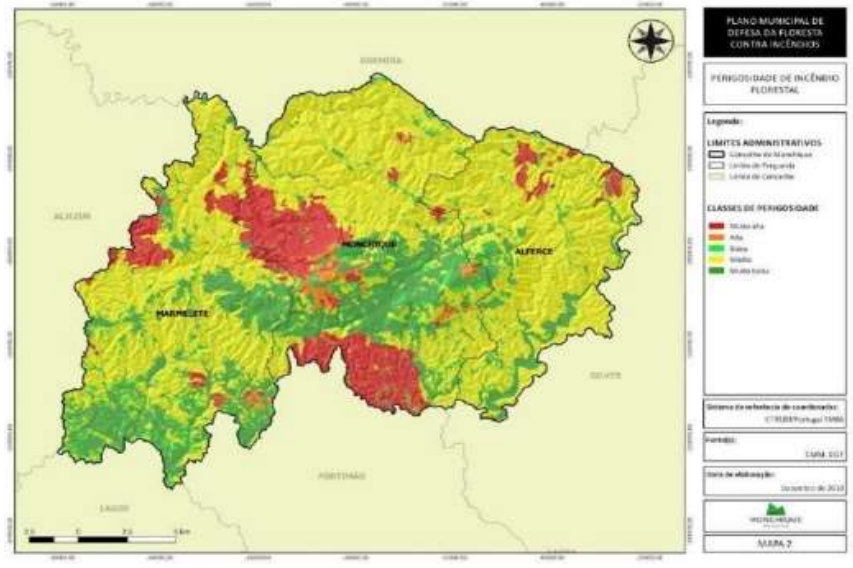

Figure 5. Susceptibility to forest fires in Monchique (PMDFCI in OTIS, 2019)

SNA APPLIED TO CASE STUDY

Actors' network (SNA boundaries)

<u>29 Entities of SGIFR:</u> (29 answers, 100%)

- Government
- Public agencies
- Third Sector, Forest associations
- Pulp and paper Companies

<u>Landowners of Monchique</u> (24 answers, 10.6%)

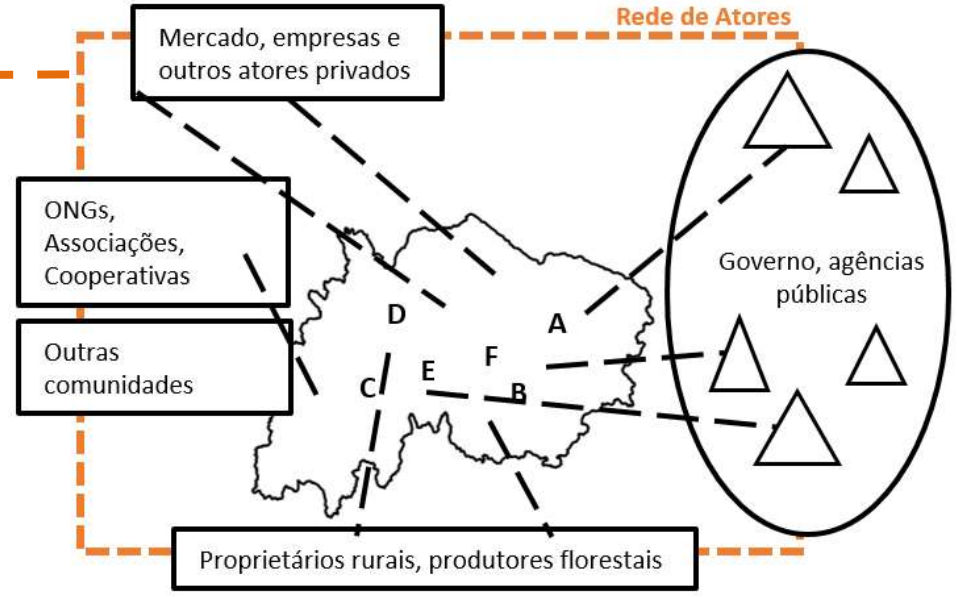

Figure 6. Co-management as governance (adapt from Carlsson & Berkes, 2005: 69)

Graph Theory (sociogram/sociometrics)

Density / Reachability / Network Centralisation / Node Degree / Betweenness Degree)

RESULTS – ENTITIES OF SGIFR

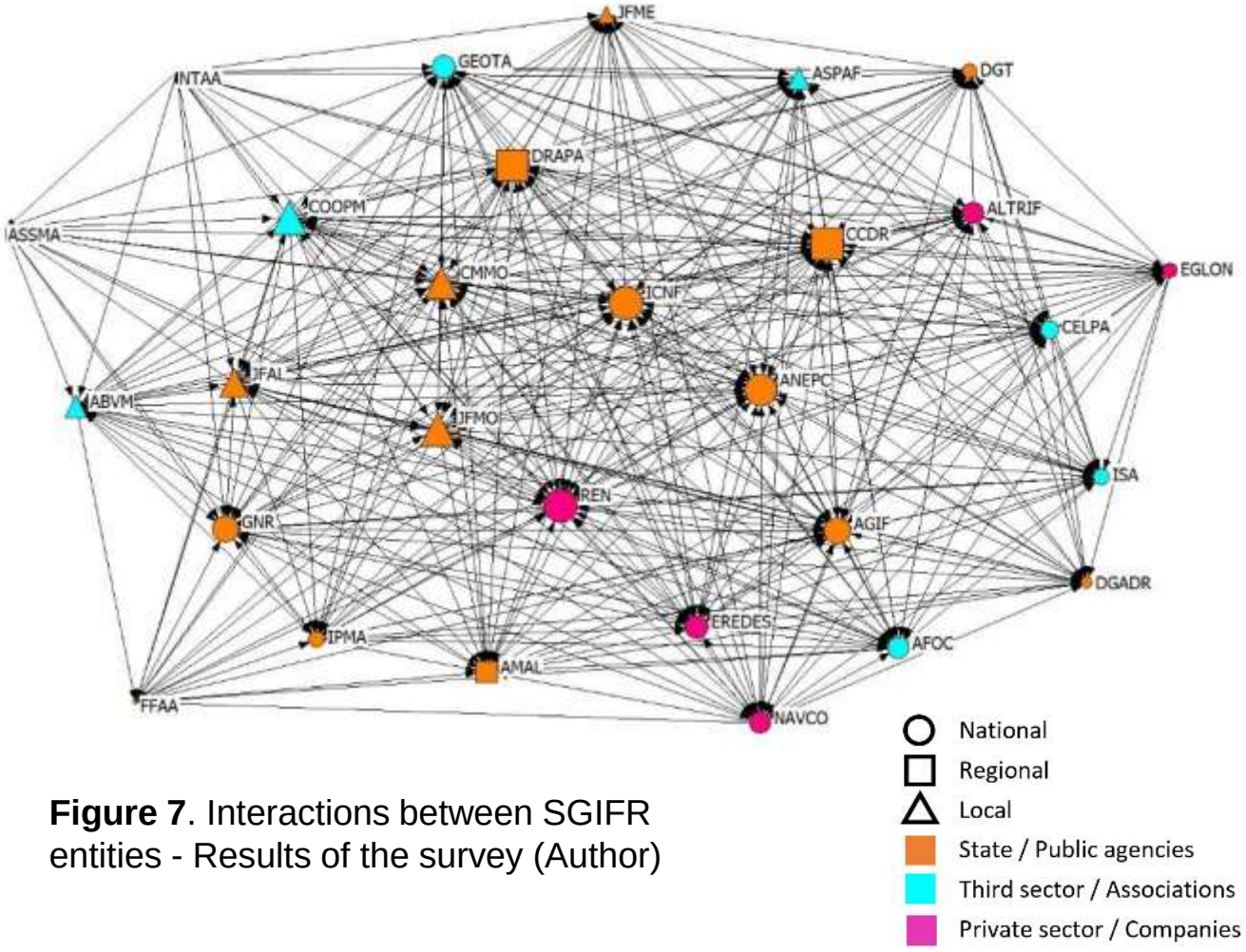

Figure 7. Interactions between SGIFR entities - Results of the survey (Author)

Density 66.62%

(541 of 812 possible interactions)

Cohesive structure with different intensity/frequency of interactions:

- ❑ 117 weight 3 (high) - 21.63%
- ❑ 167 weight 2 (medium) - 30.87%
- ❑ **257 weight 1 (low) - 47.50%**

Reachability - **all entities are reachable** to each other (path 1)

RESULTS – ENTITIES OF SGIFR

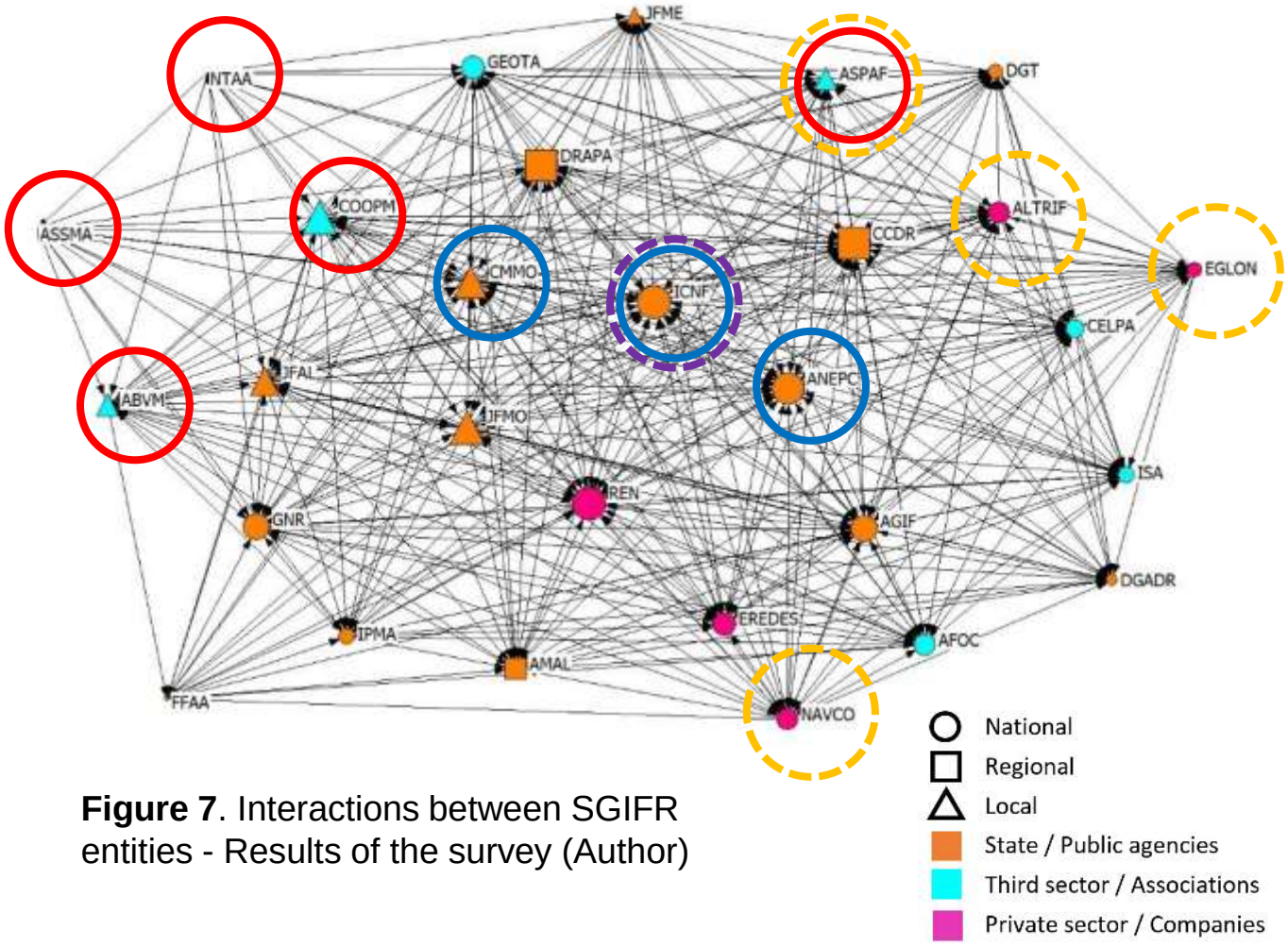

Figure 7. Interactions between SGIFR entities - Results of the survey (Author)

Ntwk Centralisation Degree 23.5%

Node Degree (actors 'position):

(**central**) Local government (CMMO) and national public agencies (ICNF / ANEPC)

Betweenness (intermed.): ICNF

(**peripheral**) Local entities including forest producers' associations and pulp and paper companies

RESULTS – FOREST LANDOWNERS

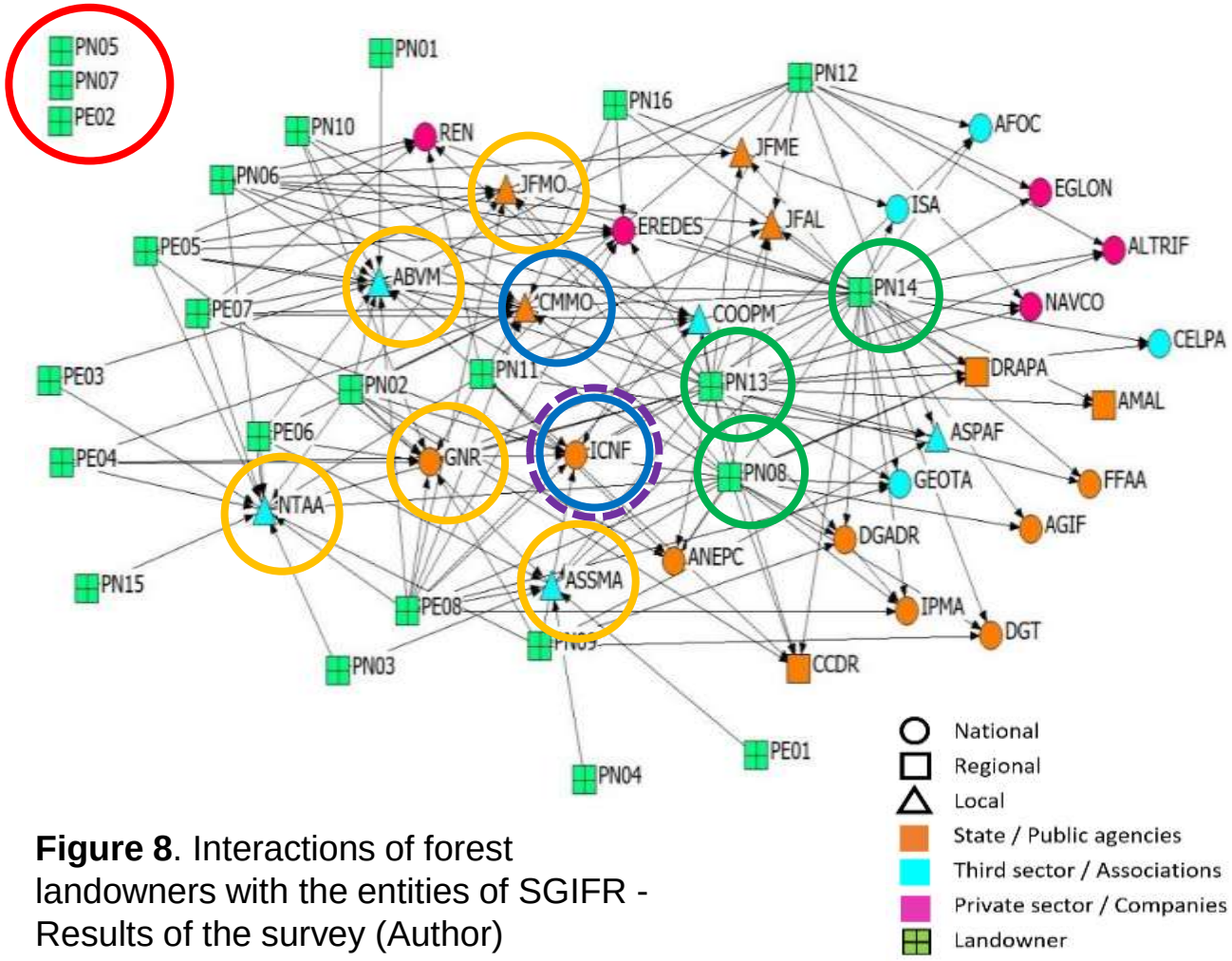

Figure 8. Interactions of forest landowners with the entities of SGIFR - Results of the survey (Author)

How do forest landowners interact with the SGIFR entities?

24 forest landowners (sample)

High interact.: **PN14**, **PN13**, **PN08**

No interacti.: **PN05**, **PN07**, **PE02**

Node Degree (**high interactions**):

- (**central**) CMMO / ICNF
- (**peripheral**) NTAA / ABVM / JFMO / ASSMA / GNR (local office)

CONCLUSIONS

Positive aspects of actors' ntwk in Monchique (**initial phase of ACoM to FF risk)**:

- ✓ Facilitates communication and dissemination of knowledge (cohesive)
- ✓ Central actors to "link" entities (weak ties) and foster trust, innovation and collaboration within SGIFR

However, a **more decentralized structure** should be pursued in the long term **to integrate local entities and forest landowners:**

- ✓ Integration of local visions, knowledge and practices within SGIFR
- ✓ Reduce the "control" of central actors in the flows and in decision-making process
- ✓ Facilitate the sharing of tasks and collaboration involving local actors

CONCLUSIONS

SNA approach can contribute to:

- ❑ Identify and analyze the actors' network involved in the management of forest territories at risk of forest fires
- ❑ Identify gaps and opportunities to enhance social learning and collaboration
- ❑ Build strategies on the current network structure to promote ACoM

Thank you!

BRIDGE Project: https://bridgecomunidade.pt/

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