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BRIDGE – a participatory-action research project for community engagement in forest fire risk prevention

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Abstract

This brief introduces the BRIDGE research project, its core objectives and the main activities that are being developed in view of stimulating local action for forest fires risk reduction. BRIDGE is a participatory action research project (PCIF/AGT/0072/2019) that aims to develop an integrative approach to different forms of knowledge and action, linking science and local communities, to reduce the vulnerability and enhance strategies for forest fire risk reduction, mainly through collective and preventive action. It was initiated in March 2021 as a consortium coordinated by the Instituto Superior Técnico, Universidade de Lisboa, also including the Laboratório Nacional de Engenharia Civil and the Universidade of Algarve. BRIDGE adopted the Monchique municipality (southern Portugal, Algarve region) as a case study, but aims to develop knowledge, tools and experiences that can be shared with other forest fire risk prone regions in Portugal and elsewhere.

An Innovation Laboratory (InnoLab) is central in BRIDGE as a privileged space aiming to promote dialogue and knowledge sharing between local communities, science and organizations involved in forest fire risk reduction, in this case in the Monchique municipality. The main objective of the InnoLab is to bring together all relevant multiple actors that act, directly or indirectly, in the management of forest territories to promote social learning about forest wildfire risk, strengthening networks and building skills and capacities, both socially and institutionally, to foster participatory processes focused on forest fire risk reduction. A Participatory Mapping method was adopted in InnoLab involving the local community, in particular landowners of Monchique, placing them at the centre of the process of identification, analysis and management of forest fire risks, valuing local knowledge and experiences to reduce vulnerabilities and strengthen adaptive capacities from the perspective of local resilience.

This brief will share achieved outcomes with the participatory mapping involving local landowners of Monchique. It represented an important social practice to foster capacity-building and collaborative actions to forest fire prevention. It also represented an opportunity to promote social learning to better understand forest territories focusing on key issues in forest fire prevention, local vulnerabilities and adaptive capacities, to trigger a Community-based Disaster Risk Reduction (CBDRR) process in Monchique.

1. The BRIDGE Project

This brief introduces the BRIDGE research project, its core objectives and the main activities that are being developed in view of stimulating local action for forest fire prevention. BRIDGE is a participatory action research project (PCIF/AGT/0072/2019) about the development of strategies for forest fire risk reduction, mainly through preventive action. It builds upon scientific and local knowledge and engages local community

action. BRIDGE means linking science and local communities to reduce the vulnerability to forest fires risk. It was initiated in March 2021, with the Instituto Superior Técnico, Universidade de Lisboa coordinating a consortium that includes the Laboratório Nacional de Engenharia Civil and the Universidade of Algarve.

BRIDGE main objective is to integrate different forms of knowledge, explore the nexus society-science-policy to contribute to stimulate forms of local action that build upon communities improved capacities of self-protection and management of local territories and ecologies. BRIDGE builds upon bottom-up approaches but also on top-down approaches, to connect to relevant policies and management orientations that are established at national and European levels. BRIDGE adopted the Monchique municipality (southern Portugal, Algarve region) as a case study, but aims to develop knowledge, tools and experiences that can be shared with other forest fire risk prone regions in Portugal and elsewhere.

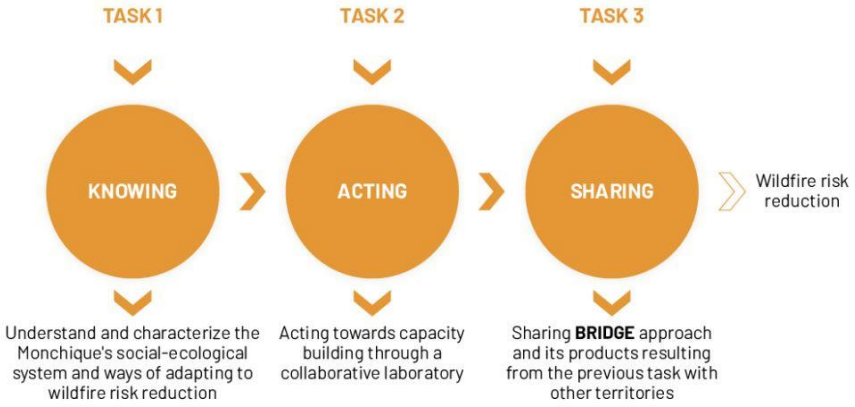

Figure 1. Main tasks of BRIDGE Project (own authors)

BRIDGE is structured in three main tasks (**Figure 1**). The first task is dedicated to improve our project team knowledge on the socio-ecological systems in Monchique and what have been forms of human adaptation to fire risk. The second task is the essence of the participatory action research during which, through the development of a collaborative innovation laboratory (InnoLab), the project aims to improve local capacities and promote dialogues that enable collective learning and sharing of knowledge and experiences on forms of reducing forest fire risks and local vulnerability. The third task aims to share with the outside communities and other territories prone to forest fire risk, what have been learnings and progresses achieved with the local community in Monchique.

In this brief we introduce our conceptualisation of the InnoLab where those collective debates are being and will be further promoted, and also share achieved outcomes from participatory mapping methodology applied in InnoLab meetings involving local landowners of Monchique. These meetings represented an important social practice to foster capacity-building and collaborative actions in view of forest fire prevention and an opportunity to promote social learning on key issues in forest fire prevention and adaptive capacities that can lead to better local resilience.

2. InnoLab: conceptualisation

An Innovation Laboratory (InnoLab) is central in BRIDGE as a privileged space aiming to promote dialogue and knowledge sharing between local communities, science and organizations involved in forest fire risk reduction. The main objective of the InnoLab in Monchique is to bring together all relevant actors that act, directly or indirectly, in the management of forest territories, promoting social learning about forest fire risk, strengthening actors' networks, building skills and capacities, both socially and institutionally, and fostering participatory processes focused on forest fire risk reduction. The ideation of the InnoLab is anchored in the support to create a common purpose of sharing knowledge and experiences and build together multiple forms of collaboration that can stimulate and promote a community-based disaster risk reduction (CBDRR).

Participatory mapping has been widely used in processes of CBDRR (e.g., Gaillard and Maceda, 2009), promoting knowledge exchange among various actors (Rizzi and Porebska, 2020). The use of this methodology

allows visual expressions of the realities perceived by the community, realities expressed through 'filtered' characteristics of the territory (Bartolucci et al., 2022). It contributes to the interpretation of risk areas, local vulnerabilities, allowing the identification of critical issues for a successful disaster risk management and to direct desired and useful risk reduction measures for the community (Cadag and Gaillard, 2012).

In March and April 2022, BRIDGE developed a participatory mapping methodology in InnoLab meetings with local landowners in Monchique, placing them at the centre of the process of identification and analysis of forest fire risk, valuing local knowledge and experiences to strengthen adaptive capacities from the perspective of self-organisation and local resilience (**Figure 2**). In total 30 landowners were involved in the participatory mapping, as members representing one of the followung organisations: Association of Forest Producers of Barlavento Algarvio (Aspaflobal) and/or Agricultural Cooperative of Monchique (Coopachique), A Nossa Terra Environmental Association and Monchique Alerta Association, the last formed by local landowners directly affected by the 2018 forest fire in Monchique.

Figure 2. Participatory Mapping with landowners of Monchique (BRIDGE)

An interesting aspect observed in the participatory mapping involving landowners in Monchique are the different local visions and interests related to forest territories. While some see the forest resources as a source of income based on forest production (in general Portuguese landowners and members of Aspaflobal and/or Coopachique), others focus on the valorisation of forest resources from the perspective of the landscape and local biodiversity (mainly in foreign landowners and members of the associations Nossa Terra and Monchique Alerta). However, even with different interests, visions and expectations, an interesting result of the participatory mapping was the convergent local knowledge of different groups of landowners about the current fire-prone areas, the main factors of forest fire risk and the local vulnerabilities of Monchique's forest territories.

The participatory mapping resulted in an important and valuable georeferenced database (GIS), elaborated on the basis of the perceptions of Monchique's community of landowners and the knowledge of local actors who act directly in the management of Monchique's forest territories. The GIS database resulted in the Integrated Map (Figure 3) containing information such as: location of participants' properties and/or houses, commonly used local access routes, forest areas of relevance and interest to participants, identification of vulnerable residents in the context of forest fires (children, the elderly, people with special needs, etc.), currently fire prone areas, main risk factors and local vulnerabilities in Monchique.

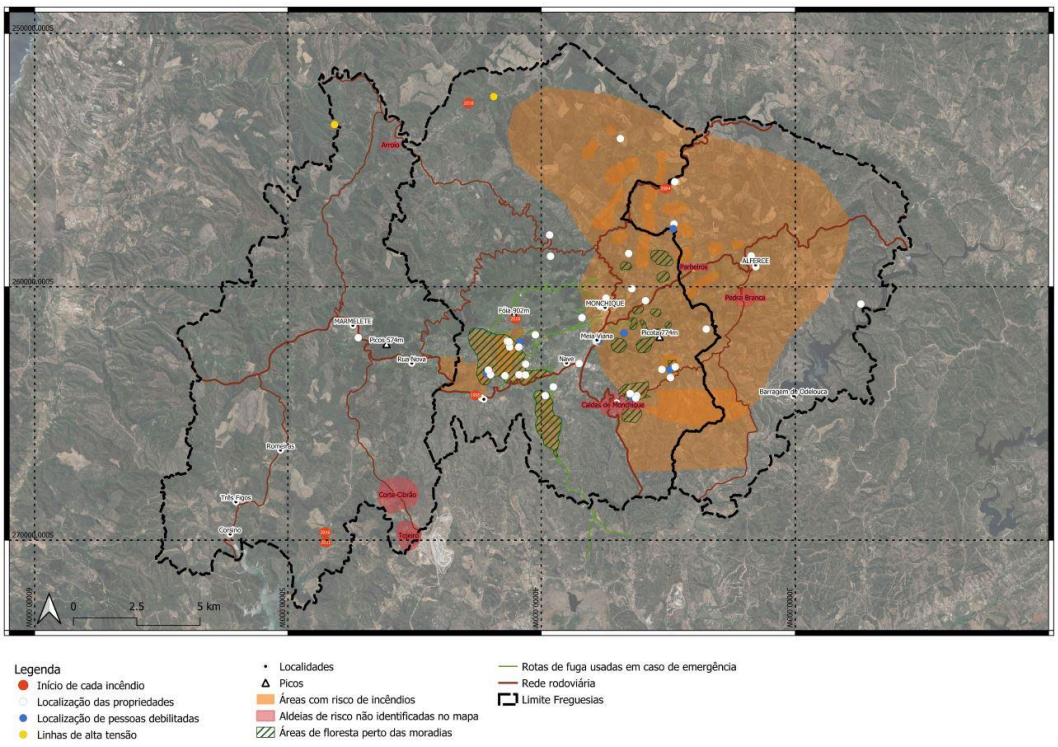

Figure 3. Participatory Map with landowners of Monchique (BRIDGE)

This GIS database, and the respective information that resulted from the debate and collective reflections involving the community of landowners, can contribute to (re)orient strategies for forest fire prevention with a bottom-up perspective, based on local knowledge and expectations. It can also contribute to (re)direct plans, programmes and policies (PPP) tailored to the local reality and specificities of Monchique, for example, the review of the Municipal Forest Defence and Fire Fighting Plan (PMDFCI) and the review of territorial development plans (e.g. Municipal Master Plan, Landscape Management and Recovery Plan, among others).

In line with scholars' suggestions in the literature, the participatory mapping also represent the opportunity for a collective debate on key issues in disaster risk management, promoting a fair and balanced dialogue (Kurastmoko et al., 2017), as well as better understanding of the territory through a social learning process (Kienberger, 2014; Wolf, 2021). In BRIDGE it is emphasized that beyond an important database that integrates diverse views, experiences, and local knowledge, the participatory mapping represents an important social practice to extend adaptive capacities to disasters (Haworth et al., 2016).

The participatory mapping developed in the BRIDGE InnoLab represent, therefore, an opportunity to involve landowners of Monchique in a social learning process on key issues in forest fire risk and prevention. Thus, it contributes to increase the understanding of forest territories, with a potential to reduce vulnerabilities and strengthening adaptive capacities to forest fire risk from the perspective of self-organization and local resilience, as well as to trigger a community-based disaster risk reduction (CBDRR) process in Monchique.

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