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NEWS

PROJECT

GUARDIAN - Green Urban Actions for Resilient fire Defence of the Interface Area

Riba-roja de Túria, Spain

TOPIC

Climate adaptation

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Zoom in: GUARDIAN community engagement - How can residents contribute to fire resilience

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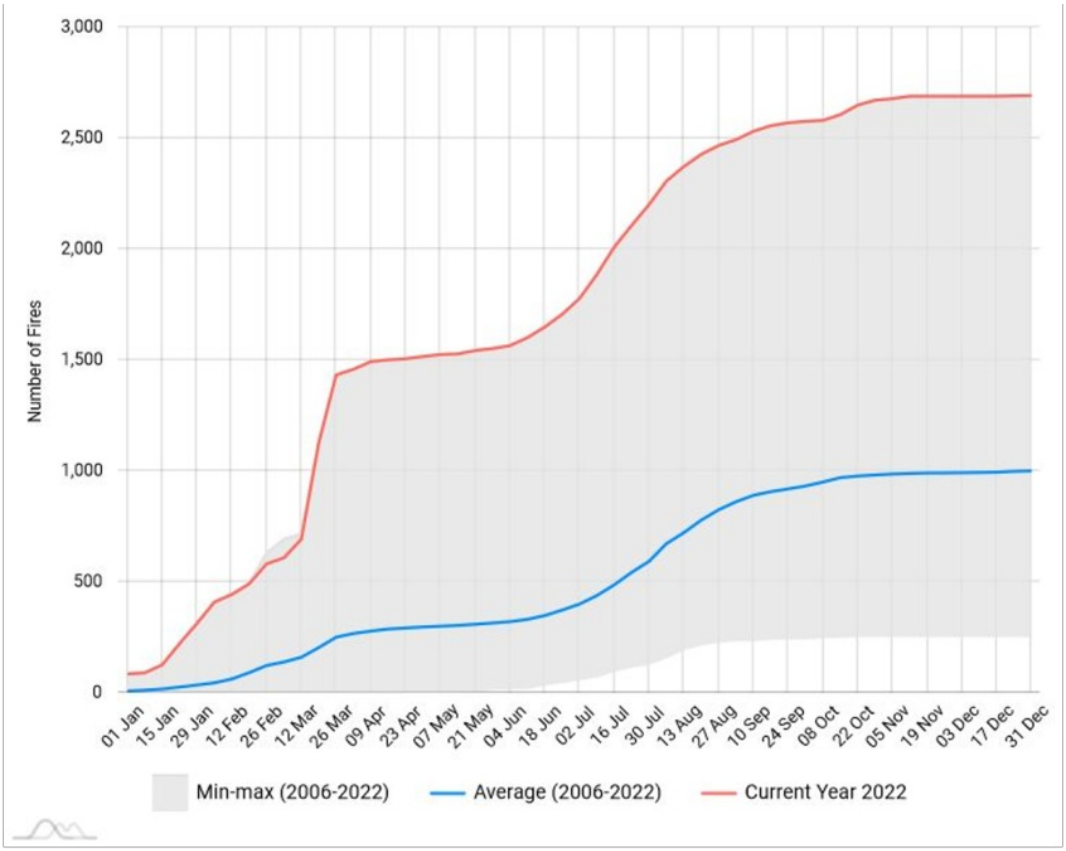
In this zoom-in the UIA expert Elsa Pastor digs into the participatory approach that GUARDIAN has implemented to engage communities within the global process of fostering fire resilience.

All actors have been addressed and empowered to become part of the GUARDIAN solution: residents, first-responders, and local policy-makers. In the next sections, you will find updated data on wildland-urban interface (WUI) fires at EU level, which provide evidence of how complex civil protection is in this type of fire emergencies. You will become familiar with international programs of fire risk awareness and preparedness that have inspired GUARDIAN partner Medi XXI to develop their approach to work with local communities. You will learn the foundations for fire resilient communities and pick up the diversity of tools and resources that Medi XXI has developed and applied for Ribaroja del Túria and Paterna communities capacity-building. Last, you will find, as wrap-up, the lessons learnt through this journey that can be of help to implement risk awareness and preparedness programs in other WUI fire prone areas.

WUI fires: a major civil protection challenge

As we have already seen during recent years, forest fires represent a rising problem in Europe. We already discussed about the root causes of this in past web article 1(e.g. global warming, rural abandonment, increasing urban pressure on forests, etc.), but we did not have the chance to share some figures highlighting this issue. Indeed, the 2022 fire season confirmed an increasing trend in terms of wildfire occurrence, intensity and area threatening wildland-urban interface communities. Actually, as it can be observed in Figure 1, figures from 2022 fire season were significantly worse than the average trend for number of fires and burned area.



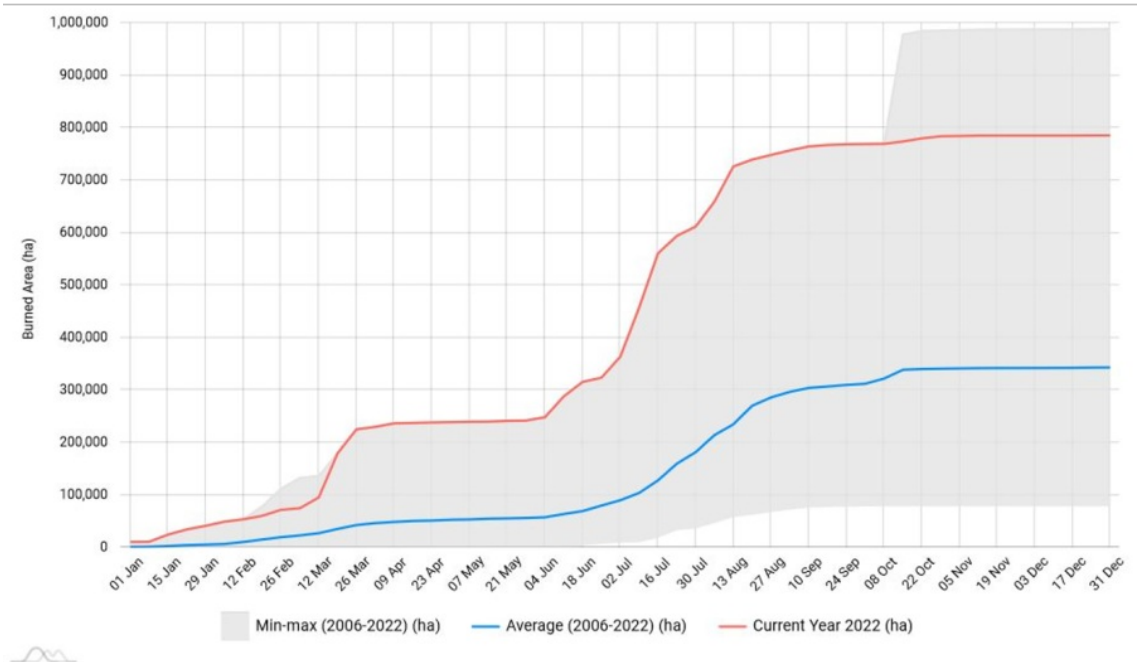


Figure 1: Seasonal trend of wildfires for EU countries, corresponding to fires of 30 ha or larger. Top: Number of fires; bottom: Area burnt. Source: EFFIS

The degree of damage observed during past summers has been unprecedented in several EU regions, even in those habituated to handle wildfire incidents. In 2018, the residential area of Mati, Greece, suffered a fire that killed 102 people and reduced more than 600 buildings to ashes. In the summer of 2021, numerous fires ravaged southern Turkey, killing 9 people and destroying hundreds of homes. Algeria also suffered several fires, with 65 deaths, and Greece, southern France, southern Italy, Cyprus and Sardinia had severe outbreaks with multiple affected towns. As for this last fire season, in July and August 2022 significant fire events took place across Europe especially in France, Portugal and Spain, but also in areas historically considered non-fire prone (e.g. UK, Germany, Czech Republic). It is worth mentioning, on one hand, the Pont de Vilomara fire incident (July 17th 2022, central Catalonia, Spain (Figure 2)) where the fire damaged 168 houses (20 severely damaged/destroyed). This has to be considered as an extraordinary degree of impact within Catalan WUI fires historical records, as houses, mostly made of non-combustible materials, tend to survive fire impact. On the other hand, I would not miss the opportunity to mention 2022 UK fires (east London, Norfolk, Lincolnshire and Sheffield) with 60 structures destroyed, which provides evidence (once again) that there are emerging fire-prone areas in northern latitudes

not adapted to wildfires.

Figure 2: Pont de Vilomara Fire impact. Source: Sergi Boixader

WUI fires are one of the most complex civil protection challenges of our society. Fire fighters' capacities have often been exceeded in recent events, as, in a WUI fire incident, it is not only a forest fire that has to be managed but also a fire percolating through inhabited areas, where people and assets must be protected. Public authorities already acknowledge that the solution has not to rely on increasing suppression efforts and resources but on a complete paradigm shift towards prevention and preparedness taking benefit from Integrated Fire Management strategies (see past Journal 1 for a complete description of the overall IFM cycle). Certainly, this is where communities have an important role to play together with other involved actors (e.g. first responders, risk managers, policy makers, etc.). People living in WUI areas have to be aware of the risk they face, and they have to be well-prepared and self-protected in case of fire impact. Unfortunately, there is still a long way to go to generally consider Mediterranean WUI communities as fire resilient, because, as explained by Medi XXI CEO Ferran Dalmau:

> Many people living in WUI areas are not aware of fire risk and home ownership implies ownership of the risk to which that home is exposed

The lack of education, awareness and training of (mostly urban) population is a critical issue in the development of fire risk adapted communities. According to recent studies (McCaffrey et al., 2013; Mort et al. 2020), citizens have generally a low knowledge and perception of what it means to live with this risk, which affects the degree of preparedness and self-protection, both necessary during the preventive, emergency and recovery phases in case of a WUI fire.

International programs on community awareness and preparation

Although there is not an EU-genuine risk awareness and preparedness framework tailored for WUI communities, some international programs might be inspiring to foster community resilience in Europe. Let me go through the basics of those that can provide successful examples of citizens' empowerment (Figure 3):

- FireSmart Canada: This national program helps Canadians increase neighbourhood resilience to wildfire and minimize its negative impacts. It was founded over 20 years ago to address common concerns about wildfire in the wildland urban interface. The FireSmart strategy combines several types of resources (Phone App, checklists, manuals, brochures, guidelines, online courses, personalized risk assessment, etc.) to be applied both at home-owner level and at community level to increase fire resilience through capacity-building in terms of risk awareness, prevention and preparedness.
- Firewise USA: Similar to FireSmart, the national Firewise USA program provides a collaborative framework to help neighbours in a geographic area get organized, find direction, and take action to increase the ignition resistance of their homes and community and to reduce wildfire risks at the local level. It was created on 2001 and run by NFPA (National Fire Protection Association) a global non-profit organization devoted to safety in all sorts of fire scenarios.
- Safer Together Victoria (Australia): As some other state initiatives in Australia, Safer Together is the program used in Victoria to reduce fire risk, fostering fire and land agencies to work together with communities. With a particular focus at landscape scale, Safer Together strategy relies on involving local communities in decision making about wildfire risk management to determine tailored risk reduction strategies and solutions.

Figure 3: Risk awareness and preparedness programs in Canada, Victoria (Australia) and the USA.

The GUARDIAN approach for empowering local communities

Inspired by those international examples, GUARDIAN has been implementing an EU-pioneering approach focusing not only on risk mitigation infrastructure and technology (i.e. green belts, water canyons) but also on developing a complete fire risk awareness and capacity-building program for Ribaroja del Túria and Paterna local communities. Indeed, this strategy has the focus on *wildfire resilience* rather than *wildfire resistance,* as disaster management has to involve not only mitigation based-strategies but also the development of a robust organizational and community capacity to respond to those (Tierney and Bruneau, 2007).

The conceptual framework used by Medi XXI to increase communities' fire resilience (Figure 4) is inspired in well-known approaches of other disaster resilience strategies that have proven robust and successful in communities facing other natural risks such as floods or seismic events (e.g. Oladukun and Montz, 2019). This framework is based on the idea that community's resilience is an intangible concept that reflects community's capacities to withstand, respond to and be recovered from a disaster. Sources of resilience can be found on the 5 well-known capitals (5C) that any community has: human, social, physical, natural and financial capital (Porrit, 2005). Capacities that are usually valued in disaster resilience are i) hazard absorption capacity (i.e. the threshold of hazard that can be assumed by a community), ii) resources availability and accessibility and iii) resource utilization efficiency (Oladokun and Montz, 2019). Regarding the approach used by GUARDIAN to consider wildfire resilience, those capacities can be found in the following specific capitals:

- Human capital: health, training, risk awareness.
- Social capital: community cohesion, engagement, shared interests, mutual trust and reciprocity between actors.
- Natural capital: natural resources properly managed for risk mitigation.
- Physical capital: infrastructures and equipment for fire suppression.
- Financial capital: financial resources to meet self-protection and resilience goals.

Figure 4: Diagram of the GUARDIAN fire resilience strategy based on the 5 capitals.

This approach allows designing and implementing capacity-building-oriented actions for communities, as has been done by Medi XXI in GUARDIAN. Ferran Dalmau and his colleagues have planned and carried out different types of activities, detailed later in this zoom-in, to increase Ribaroja del Túria and Paterna capacities for fire resilience apart from designing and building the GUARDIAN water infrastructure and green belts. They have also put the focus on human and social capital, and, as stated by Ferran:

> Working with communities is very challenging, even more than fire protection engineering!

This is completely true as community transformation processes are complex, long lasting and multi-dimensional, as they have to balance long-term goals with short-term concerns. The success of GUARDIAN in this regard has relied on applying the following principles, inspired by Rotmans et al., (2001):

- Long-term thinking (at least within a 25-year framework) instead of short-term policy implementation. Resilience to wildfire scenarios requires long-term goals, as wildfire involve long-term impacts.
- Thinking in terms of more than one domain (multi-domain) and different actors (multi-actor) at different scale levels (multi-level). Definitely, there are several socio-economic dimensions to consider for wildfire resilience as well as many different stakeholders at local, regional and national level.
- A focus on learning, with a special learning-by-doing philosophy. A participatory approach has to be foreseen in all training and risk awareness activities so to be efficient.
- Keeping a large number of options, i.e. counting on a wide playing field with a large variety of resources: media resources, lectures, experimental burnings, field trips, etc.

Let me highlight the capacity-building toolbox that Medi XXI has developed over the years for WUI communities:

Risk awareness gatherings

Wherever the community is located, Medi XXI team has the flexibility to deploy their resources and share their vision to the neighbours and local stakeholders (Figure 5). The main aim of these sessions is twofold: in one hand, this activity is used to capture the community's problems and needs so that to start a co-creation process for increasing wildfire resilience. On the other hand, sessions are also used to gather data on fire risk awareness through specific surveys, which include questions as:

- How do you perceive the possibility of a forest fire occurring in your town?
- How do you perceive the possibility that the fire may affect your home?
- At what scale do you think it is most important to carry out actions to reduce forest fire risk? National? Regional? Local?
- Do you think that there might be measures that can be taken at the homeowner level or community level?
- Do you know if there are wildfire self-protection planning instruments designed and deployed in your town?

Sessions are specially tailored for residents, but similar activities are usually undertaken to get the engagement of other stakeholders as well: the vision of first-responders, local fire risk managers and policy makers is also needed

and included in this participatory approach.

Figure 5: Risk awareness gathering at Gata de Gorgos (Alicante, Spain, 2018) performed by Medi XXI technicians.

Creative workshops for training and education

Through a large diversity of techniques, education and training workshops are specially designed to a large variety of target audiences (residents, schoolchildren, vulnerable groups such as elderly people or people with functional diversity, first-responders, local fire managers, etc.).
Training and education topics cover both general aspects (i.e. climate change and climate adaptation, wildfire resilience, integrated fire management, wildfire behaviour, wildland-urban interface fires) or more specific fire-related topics (e.g. fire suppression means, self-protection, prescribed fires, emergency management, etc.).
Medi XXI undertakes these activities in different environments and formats; talks and conversations, field trips, practical demonstrations, serious games through Virtual Reality exercises, etc. (Figure 6).

Figure 6: Top left: Poster announcing a workshop with live demos at Ribaroja del Túria: top center: training of portable fire suppression water canyons; top right: education activity with real fire on WUI fire risk. Bottom left: self-protection training activity with Ribaroja del Túria residents; bottom right: training activity with first-responders at Ribaroja del Túria.

Home assessment through door-to-door visits

This activity consists on a voluntary property assessment regarding vulnerability and risk mitigation measures through door-to-door visits (Figure 7). A formally trained assessor visits the property with the resident and review key aspects regarding home vulnerability and self-protection potential. The list of aspects usually discussed are:

- The potential use of residents' resources in case of fire emergency: water from swimming pools, tanks or ponds linked to self-protection kits; garden's vegetation watering to increase fuel moisture, etc.
- The main components of structure's vulnerability: glazing systems, vents, roofs and their maintenance, etc.
- The presence of residential fuels (either natural or non-natural) around the structure and their distance within the home-ignition-zone: shrubs, ornamental trees, green hedges, outdoor furniture, secondary structures, sheds, etc.
- The protocol applied in case of emergency by first-responders and the role of residents in this: evacuation, confinement, stay-and-defend, etc.

Figure 7: Home visit at Ribaroja del Túria

Lessons learnt from GUARDIAN public participation process

Medi XXI technicians have learnt through the years how important (and challenging!) is to have a community engaged through the adaptation process of becoming fire resilient, and GUARDIAN has not been an exception. They have the objectives of their activities 100% clear and they know what can (or cannot) be expected from current Mediterranean WUI communities, which have (generally) a poor baseline in terms of fire risk awareness and education.

Despite that, there are some basic messages that are successfully conveyed through Medi XXI capacity-building program and that we certainly believe that those have a long-lasting effect. For instance, we are sure that GUARDIAN communities are nowadays aware of what they should do in case of fire and what they should not do. They are fully aware that they can be part of the solution if they prepare their homes appropriately and they deploy (if possible) a stay-and-defend strategy or part of the problem if their response is not adequate (Figure 8). This might seem a rather simple achievement, but believe me, it is not. These lessons save lives and make emergency management less complex.

For a capacity-building program tailored for WUI fire communities to be fully successful, there are some requirements that Medi XXI have already identified. Some of them are easy to achieve/implement, some others

are not that straightforward. This is the list of the "must-have" items to be considered when designing the implementation of a risk awareness and education program in WUI communities:

- Political will: this is a basic step. If local politicians are not engaged in the process, the program will fail. Fortunately, this has not been the case in GUARDIAN, as local policy-makers of both municipalities (Ribaroja del Túria and Paterna) have always been supportive. Of course, the clue is making them fully aware of the fire risk their municipalities have. Educating politicians before educating residents is a must.
- Ensuring a "critical mass" of engaged residents: There is a minimum percentage of WUI residents that have to actively participate in the capacity-building program to take effective action for change. Engaging community leaders (from neighbouring associations and local organizations) is a must. Local "allies" are needed to foster mutual trust and have communities receptive to changes.
- Ensuring successful training of first-responders: this is particularly needed when there are specific risk mitigation resources to be activated in case of fire (as in GUARDIAN). Resources have to be used efficiently to guarantee full performance. Training of all actors (not only residents) is a must.
- Monitoring and evaluation of program performance: how good our program is? How successful our training has been? How aware of fire risk our communities are? To find quantitative metrics for an abstract concept as fire resilience is a very challenging task, but receiving reliable and objective feedback is a must.
- A global risk awareness and preparedness framework: we need a global scheme to create a common culture on risk prevention and preparedness. Inspired by Firewise or FireSmart efforts, the foundations for an EU-specific program have been already developed through many different research and implementation initiatives, being GUARDIAN just one of those. Having an EU program to foster community resilience and empower more and more citizens is truly a must!

Figure 8: Left: Inadequate response to a wildfire situation from a resident at a WUI (using water buckets and not wearing highly flammable clothing, versus Right: two residents wearing personnel protection equipment and deploying a water line in a safe zone.

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