Horizon Europe (HORIZON)

SEMEDFIRE
South Eastern Mediterranean
Excellence Development in Fire Research

Project number:	101079337
Project name:	South Eastern Mediterranean Excellence Development in FIre REsearch
Project acronym:	SEMEDFIRE
Call:	HORIZON-WIDERA-2021-ACCESS-03
Topic:	HORIZON-WIDERA-2021-ACCESS-03-01
Type of action:	HORIZON-CSA
Service:	REA/C/03
Project starting date:	fixed date: 1 December 2022
Project duration:	36 months

D5.3 Forest Fires Community Engagement Plan for Cyprus and the Region

Work Package	WP5
Deliverable Number	D5.3
Lead Partner	European University Cyprus (EUC)
Deliverable Type	R – Report
Dissemination Level	PU – Public
Due Date	Project Month-30 | 31/05/2025
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Version	Date	Changed page(s)	Cause of change	Partner
V1	07/02/2025	First draft		EUC
V2	07/03/2025	General review and editing		EUC
V3	31/03/2025	General review and editing		PCF
V4	14/04/2025	General review and editing	Mature Draft by Authors and Contributors	EUC / PCF
V5	19/05/2025	Final Draft	Final Draft to be reviewed and validated by Steering Committee	EUC
V6 (SyGMa submission)	28/05/2025	Final Submission-version (reviewed and validated by Steering Committee)	Validation by Steering Committee AND by Quality Assurance Managers	EUC

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1. Introduction

The "Southeastern Mediterranean Excellence Development in Fire Research – SEMEDFIRE" project is funded by the European Commission, through Grant Agreement no. 101079337, under its HORIZON EUROPE Programme, and more particularly within the WIDERA-2021-ACCESS-03-01 Twinning Topic. In full alignment with the WIDERA-Twinning-topic's requirements, SEMEDFIRE aims to enhance the capacities and knowledge-acquisition of the Widening institution; EUC, in Research-&-Innovation (R&I) and Research-Management-Administration (RMA) relating to Fire Safety and Fire Management. This is aimed through networking activities with five top-class leading counterparts at EU level; IMPERIAL COLLEGE, WAGENINGEN UNIVERSITY, PAU COSTA FOUNDATION, FRENCH GENERAL DIRECTORATE OF CIVIL SECURITY AND CRISIS MANAGEMENT and NIMES-Metropole, which represent a multifaceted, but complementary and synergistic, 'geography' of R&I philosophies and approaches, comprising:

- two leading Academic institutes in the area of fire safety and integrated fire management;
- a leading Foundation in investigating fires and communities-engagement;
- a Governmental Agency leading the EU-effort in operationally combating wildfires;
- an Agglomeration of Municipalities providing the tangible example of local governance in wildfire;
- representation of both Member States and an Associated Country;
- linking of the European Research Area (ERA) in a "compass" fashion: from north (UK) to central Europe (FR, NL), to the west (ES), and to the Mediterranean biogeographical region (ES, FR, CY) and its South-Eastern area (CY).

The networking-for-excellence and twinning-contributions of the internationally leading Advanced Partners in knowledge-transfer and capacity-building, focus on both EUC and within and for its surrounding targeted stakeholders from public governance, industry/ entrepreneurship, and civic society, at local and regional levels. It is hence scoped to raise the profile and reputation of EUC to such a level of ERA-excellence that it will be able to become a lighthouse of spreading fire-science excellence in Cyprus and the SE Mediterranean.

The document at hand, in accordance with the Grant Agreement (GA), constitutes Deliverable **D5.3 Forest Fires Community Engagement Plan for Cyprus and the Region**, prepared by the Widening Institution; European University Cyprus (EUC), collaboratively and with strong support from the Advanced Partner Pau Costa Foundation (PCF). Deliverable D5.3 constitutes the culmination of the work of WP5 and highlights how the Widening EUC puts to tangible use and praxis the expertise and knowledge transferred by the Advanced Partner PCF.

1.1. Contextualization for the Present Strategy-document

The present document entitled 'Forest Fires Community Engagement Plan' is complementary to the document named Integrated Fire Management (IFM) strategy in Cyprus. It gives details on how to answer to the challenges identified in the strategy, by proposing a first action plan on wildfire management for Cyprus with potential stakeholders and responsible for each action. We advise to read first the document on the strategy as it also presents the wildfire risk in Cyprus, the recent evolution of forestry and agricultural sectors and our vision on wildfire management for Cyprus. This IFM strategy document also highlights the specific role of the Department of Forests (DoF) in wildfire management and the need for whole society engagement in wildfire prevention.

Under the Auspices of the Ministry of Agriculture Rural Development and Environment of the Republic of Cyprus, through the SEMEDFIRE EU-funded project, and complementarily under the Auspices of the Office of the Environment Commissioner of the Republic of Cyprus (through the RESALLIANCE EU-funded project), the Centre-of-Excellence in Risk and Decision Sciences (CERIDES) of the European University Cyprus (EUC) brought together a great diversity of actors to support the development of integrated fire management in Cyprus. During participatory workshops, EUC-CERIDES facilitated participation from experts from Cyprus and across Europe to share their knowledge and to progressively develop, in collaboration with workshop's participants, a strategy and an action

plan for becoming a country more resilient to wildfire risk. In this work, contrary to past approaches which were more focused on wildfire suppression, a greater emphasis was placed on wildfire prevention, land management and collaboration between firefighters, foresters, farmers, livestock breeders, landowners, local communities and authorities to improve landscape resilience.

SEMEDFIRE project aims to enhance the capacities and knowledge-acquisition relating to fire management in Cyprus. The SEMEDFIRE Advanced Partner Pau Costa Foundation (PCF) supported the Widening Institution; EUC in the identification of these key actions, in close relationship with the Department of Forests (DoF) of the Republic of Cyprus. The identification of Strategic Management Areas in Cyprus, the use of prescribed fire and the development of controlled grazing in strategic areas were key actions on which our partner PCF gave us valuable inputs to facilitate their use in Cyprus. They are key elements of this stakeholder's engagement plan.

This work has been produced by European University Cyprus, CERIDES mainly in the framework of the EU-funded projects SEMEDFIRE (GA 101079337) but also took in consideration outputs of workshops done in the framework of ResAlliance, another EU-funded project (GA 101086600). The final goal of SEMEDFIRE project is to co-develop, before the end of 2025; a Fire Management Suite, an Integrated Fire Management Strategy, a Stakeholder's Engagement Plan for Forest Fires, and a White Paper on Fire Governance through Interagency cooperation for fire management in Cyprus.

1.2. Wildfire Peer Review Assessment Framework

The following chapters are presented using the Wildfire Peer Review Assessment Framework structure (Wildfire PRAF[1]) based on the Peer Review Assessment Framework (PRAF) developed to provide technical support for comprehensive and thematic reviews of disaster risk management within the UCPM 2020-2024 programme cycle. The PRAF covers all stages of the disaster risk management cycle structured on seven key topics on which the analysis should be based.

Wildfire peer reviews are a strategic tool for strengthening resilience against wildfires at the European, national, and sub-national level. The primary objective is to exchange knowledge on wildfire risk management across and beyond Europe through independent analyses conducted by experts from different Member States and UCPM Participating States. The **aim is to identify and share good practices that are already in place, identify areas for improvement, and collect recommendations for enhancing wildfire risk management systems**.

Figure 1: Main thematic areas of analysis for UCPM peer reviews on disaster risk management.

The present work and document are inspired by the wildfire peer review assessment framework and conducted as a **collaborative analysis supported by the partners engaged in SEMEDFIRE project**. In addition to the assessment process, our methodology also aims to build-up a common understanding on the need of integrated fire management strategy as well as capacity building of the involved stakeholders.

1.3. Responsible for action

In chapter 2, we proposed a list of action to facilitate the implementation of an Integrated Fire Management in Cyprus following the ideas developed in the integrated fire management strategy previously co-developed. For each action

[1] Wildfire Peer Review Assessment Framework, Avril 2024, https://civil-protection-knowledge-network.europa.eu/media/wildfire-peer-review-assessment-framework-wildfire-praf

of this strategy, we propose a "potential responsible" for its implementation and follow-up. Nevertheless, we precise that the implementation of most of these actions need a strong collaboration between different stakeholders. The denominated "potential responsible" is only a lead responsible in charge of facilitating the implementation of the action in coordination with the others relevant stakeholders.

In these potential responsibles, you will find the following stakeholders:

- **The Department of Forests (DoF)** in charge of forest fire prevention and suppression in the public forests and 2km around these areas.
- **Ministry**: The Ministry of Agriculture, Rural Development and Environment which have been strongly involved in this work and coordinate the departments of Forests, Agriculture, Environments and Water.[2]
- **Inter-Ministerial (and Council-of-Ministers):** when the action needs a political decision defining a responsibility to a specific governmental authority.
- **Civil Protection:** Presently named Civil Defence but we consider here the agency with extended capacities.
- **Fire Brigade** in charge of fire suppression outside of forests and 2km buffer, as well as **the Defence Fire and Rescue Service** for the UK bases territory.
- **Cyprus Organization of Agricultural Payments (CAPO/KOAP):** regarding financial support to vegetation management practices linked to agricultural and husbandry activities.
- **Local authorities:** District level and municipalities which have more capacities but also communities. The implementation of these actions may need support from governmental agencies, NGOs or research agencies.
- **Research Agencies**: for actions needing a scientific approach and collaboration with others European academic institutions, facilitating the capacity building of Cypriot organisations.
- **NGOs**: e.g. for facilitating the link and capacity building of local authorities and citizens.
- **Police** which are especially involved in fire investigation.

The below stakeholders haven't been listed as potential responsible for a specific action, but they are key stakeholders for an integrated fire management.

- **Farmers unions and representatives** in facilitating the implementation of adequate vegetation management practices
- **DG Growth – Directorate for Sustainable Development** which could facilitate adequation with others national actions plans
- **Cyprus Deputy Ministry for Tourism** have a role to play to ensure safety and behaviours of visitors
- **Department of Meteorology** is providing Meteorological data and inform about the high wildfire risk prediction.
- **Department of Agriculture** could support the definition and implementation of a policy for vegetation management with adequate agricultural practices
- **Department of Environment** could support in defining adequate recommendations for vegetation management practices to preserve biodiversity
- **Game and Fauna Service:** Responsible of the Birds Directive, they could support landscape adaptation and give recommendations regarding bird's habitats.

All the stakeholders upon have been involved through participative workshops as well as the business sector through the participation of the Cyprus Chamber of Commerce and Industry as well as a few private companies. More than 50 organizations (see list chapter 10 of IFM Strategy) and more than 100 people have been involved in one or more workshops of SEMEDFIRE and ResAlliance projects supporting the development of an integrated wildfire management strategy and action plan. We thus thank them for their active participation and essential contributions. We specify, however, that opinions expressed in this document are SEMEDFIRE consortium's observations, derivations and statements, and do not bindingly engage any stakeholders involved. This list also expresses the diversity of the stakeholders involved.

[2] Ministry website, opening speech of Minister at the Nicosia Risk Forum 2024 organized by EUC-CERIDES : https://www.gov.cy/en/speeches/speech-by-the-minister-of-agriculture-rural-development-and-the-environment-of-the-republic-of-cyprus-dr-maria-panagiotou-at-the-nicosia-risk-forum-2024-with-the-subject-safety-security-a/

2. Stakeholders' engagement plan

Below is presented a synthesis of key actions that could be implemented to facilitate the development of a wildfire risk integrated management in Cyprus. More details are given in the following chapters. This action plan should be discussed in a participative workshop in May 2025 with key stakeholders to confirm potential responsible proposed.

2.1. Wildfire Governance

This section covers the overall governance of wildfire risk management at the national and/or sub-national level. The actions proposed focus on the wildfire risk management policy and regulation, the horizontal and vertical coordination and cooperation among key stakeholders involved in wildfire risk management, wildfire risk financing strategies and systemic resilience.

Description of the action	Short or medium term	Potential responsible
Facilitate workshop on integrated wildfire management to improve understanding and engagement of local authorities and land planning agencies	ST	Research institutes?
Validate a short-term action plan to improve wildfire management based on this actual first analysis and proposed action plan	ST	Ministry
Promote the Landscape Fire Governance Framework at EU level to facilitate adaptation of actual EU policy to support vegetation management practices	ST	Ministry
Identify funding and assess payment for environmental services to develop vegetation management measures through present others EU or national plans and funding schemes	ST	Ministry
Assign a responsible for wildfire prevention outside of public forested areas and 2km buffer managed by the Department of Forests	ST	Inter-Ministerial (Council of Ministers)
Approve a “Lead Agency” to develop an integrated wildfire management plan with a coordinative role on prevention actions on the full territory.	ST	Inter-Ministerial (Council of Ministers)
Put in place stricter regulation regarding the use of fire during the wildfire season and ensure its implementation	ST/MT	Lead Agency (as approved by Ministerial Council)
Develop a legal framework and regulation to support partnership between landowners, local authorities and government to improve vegetation management and reduce wildfire risk in strategic areas.	ST/MT	Lead Agency (as approved by Ministerial Council)
Define clear responsibilities of each stakeholder for fire management regarding planning, prevention, preparedness, suppression and recovery measures	ST/MT	Lead Agency (as approved by Ministerial Council)
Develop a national fire management policy with a regulation on the use of fire in prevention and suppression (traditional fire, prescribed fire, backfire)	MT	Lead Agency (as approved by Ministerial Council)

Develop a legal framework to register volunteers and insure their safe and adequate participation to fire management in prevention and pre-suppression actions.	MT	Civil Protection
Built-up a regional alliance for wildfire management to enhance capacities in implementing integrated fire management and improve resilience to climate change.	MT	Lead Agency (as approved by Ministerial Council)

2.2. Wildfire risk assessment and communication

This section covers risk assessment processes addressing wildfire risk at the national and/or sub-national level. The action proposed focus on the three stages of the assessment process (wildfire risk identification, analysis, and evaluation). It also looks at the communication and sharing of results as well as risk awareness and communication processes with key stakeholders and the general public.

Description of the action	Short or medium term	Potential responsible
Put in place a pluri-disciplinary technical working group on wildfire management to support implementation of actions with a scientific support of research agencies	ST	Ministry
Develop a simplified risk analysis to define a first version of the strategic management areas where preventive vegetation management measures should be implemented (not only for public forest).	ST	DoF supported by research agencies
Harmonize and share a wildfire GIS database with relevant services and research institutes to improve general understanding of wildfire risk in Cyprus.	ST	DoF supported by research agencies
Develop a fuel load mapping and use fire modelling to better identify wildfire risk areas to prioritize prevention measures	MT	DoF supported by research agencies
Define the fire regimes in Cyprus and implement the full technical methodology to identify the strategic management areas to prioritize adequate preventive measures (vegetation management).	MT	DoF supported by research agencies
Train fire analysts in the Department of Forests to improve their skills in preventing and suppressing wildfire in Cyprus	MT	DoF
Assess the use of traditional burning to better regulate its use during the fire season and promote the use of alternative technics during high wildfire risk days.	MT	Research Agencies
Promote training for communicators to develop skills in participatory, and place-based communication[3]	ST	DoF
Develop an adequate communication campaign that spreads awareness of the need to improve vegetation management before fire season begins each year,	ST	Lead Agency (as approved by

[3] EU PyroLife Deliverable D17: Toolkit for fostering cocreation and participative community engagement with vulnerable communities at risk (download the full report here, or the factsheet here)

focused on rural and peri-urban population with targeted messages to each stakeholder group (e.g. residents, landowners, tourists/visitors, migrants, etc.).		Ministerial Council)
Develop sectoral and local wildfire communication programs based on the outcome of statistics, reports and risk perception analysis as well as the knowledge, interests and needs of communities.	MT	Lead Agency (as approved by Ministerial Council)
Create a communication and education plan on risk prevention and climate change (including wildfire management) for educational institutions using creative methods.	MT	Lead Agency (as approved by Ministerial Council)

2.3. Wildfire risk management planning

This section covers the processes for planning wildfire risk management at the national and/or sub-national level, with the aim of managing and reducing wildfire risk. Proposed actions cover also the engagement of key stakeholders, the methods for identifying and prioritising wildfire risk management measures, the monitoring, evaluation and reporting processes, and the policy coherence with other key planning processes linked to wildfire risk.

Description of the action	Short or medium term	Potential responsible
Develop and communicate forest management plan to identify risk management measures for public forests to reduce wildfire risk.	ST	DoF
Develop pilot projects on fuel management with engaged communities to support the development of a legal framework to implement vegetation management measures like controlled grazing in strategic areas	ST	DoF, NGOs and Research agencies
Develop local wildfire prevention and preparedness plan with local authorities in high wildfire risk areas and affected communities to improve resilience of the communities and their environment.	MT	Local authorities/ NGO
Facilitate elaboration of forest management plan in private forests to identify risk management measures to reduce wildfire risk.	MT	Lead Agency (as approved by Ministerial Council)
Define a pluriannual prescribed burning plan focused on strategic management areas validated by landowners and environmental authorities.	MT	DoF
Develop and validate a national integrated fire management strategy and action plan to better protect lives, infrastructures and eco-systems in Cyprus (including monitoring and evaluation process).	MT	Lead Agency (as approved by Ministerial Council)
Identify specific areas where agroforestry and vineyards should be promoted to act as green fire break to protect forests, ecosystems and human settlements.	MT	Local authorities
Develop a long-term vision to adapt the forest management to climate change and more extreme weather conditions (wildfire, drought, floods, heat waves)	MT	DoF
Develop a financial mechanism to promote widely vegetation management measures like controlled grazing in strategic management area and rural urban interface.	MT	Lead Agency (as approved by Ministerial Council)

2.4. Wildfire Prevention

This section covers important wildfire prevention measures aimed at reducing risks or mitigating adverse consequences of a wildfire event for people, the environment, and property, including cultural heritage sites. Proposed actions focus on the overall framework underlying the identification and implementation of preventive measures. It also examines the review of key landscape management measures, fire use laws, and guidelines in place, as well as their enforcement.

Description of the action	Short or medium term	Potential responsible
Ensure implementation and follow-up of forest management plans in public forest maintaining forest roads, fire breaks and implementing vegetation management measures (thinning, pruning, controlled grazing and burning…)	ST	DoF
Test prescribed burning and value demonstration results to develop specific recommendations to facilitate its adequate use in Cyprus.	ST	DoF
Train a team of the Department of Forests on prescribed burning and implement a first prescribed burning plan supported by experts.	ST	DoF
Increase state budget allocated to wildfire prevention initiatives through existing financial mechanism (CAP funding…) or new funding schemes.	ST	CAPO
Ensure communication and enforcement of the law regarding wildfire prevention to reduce fire ignition (fire ban during high wildfire risk days…)	ST	DoF / Police
Value rural areas and environment protection through dialogue and participation of citizens in vegetation management actions (like mechanical clearing around villages to create defensible space).	MT	Local authorities/ NGO
Promote the use of incentives or tax deduction for clearing dry vegetation around houses and villages (rural urban interface).	MT	Lead Agency (as approved by Ministerial Council)

2.5. Wildfire Preparedness

This section covers important wildfire preparedness measures aimed at establishing a state of readiness and capability of human and material means, structures, communities and organisations for ensuring an effective, rapid response to a wildfire event, achieved through advance action. Proposed actions focus on the overall process supporting the identification and implementation of preparedness actions but also present key preparedness measures linked to contingency planning processes, early warning systems, training, exercises and international exchanges, and development of response capacities.

Description of the action	Short or medium term	Potential responsible
Ensure wildfire preparedness for fire season (water supply, availability of human and material means, test operational procedures, ground and air patrol, telecommunication…)	ST	DoF / FS / CP
Improve early warning system to facilitate communication and information from/to the public and all governmental services (112 new generation).	ST	CP
Develop evacuation plan focussing first on high wildfire risk areas	ST	Local authorities (+FS)

Develop training for fire volunteers' teams in prevention and pre-suppression actions and improve coordination mechanism with authorities.	ST	Civil Protection
Improve communication tools for general public and responsible authorities for prevention, preparedness and emergency.	ST	Lead Agency (as approved by Ministerial Council)
Test and develop the use of smart sensing devices for early-detection and real time monitoring and support innovation.	ST	DoF + Local Authorities
Implement table-top and field exercise to test operational procedures and improve coordination in wildfire suppression operations	MT	DoF (+ Local Authorities)

2.6. Wildfire emergency response

This section covers activities and processes related to the response phase of a wildfire event. The proposed actions focus on process for assessing needs and impact, response operations, vertical and horizontal coordination processes.

Description of the action	Short or medium term	Potential responsible
Update operational fire-suppression and evacuation plans to clarify roles and responsibility of leading agency and local authorities in preparedness and suppression operations.	ST	Inter-ministerial (Council of Ministers/ Fire Service/ DoF/ Civil Protection
Update and communicate operational fire suppression plans depending on the risk of explosion and spread of fires as well as an Incident Command System (Forest Strategic Planning)	ST	DoF
Promote regional cooperation on wildfire management by mutualizing means and facilitating coordination during the fire season.	ST	Inter-ministerial (Council of Ministers) / DoF / Local Authorities
Organize training for practitioners regarding the use of technological tools for decision-making process for addressing an incident.	ST	DoF / CP / Local Authorities
Use a fire propagation model to improve prediction and response by improving fire-modelling capacity of the authorities (Decision support systems (DSS) using fire behavior models.	MT	DoF

2.7. Recovery and lessons learned

This section covers important wildfire recovery and review processes implemented in the wake of a major wildfire event. It focuses on the post-disaster phase and addresses the implementation processes of recovery and restoration plans, the build-back-better adaptation and climate proofing processes, and the lessons learned procedures in place to identify good practices, areas for improvement and wildfire risk management measures needed to mitigate risk and strengthen resilience.

Description of the action	Short or meidum term	Potential responsible
Clarify and harmonize wildfire investigation procedure to have a systematic standardized continuous data collection process (fire occurrence, behavior, cause, impacts)	ST	DoF
Following wildfire investigation, develop an action plan to reduce fire occurrence and ensure a follow-up on the implementation of the plan (eg: wild dump sites)	MT	Lead Agency (as approved by Ministerial Council)
Facilitate exchange of good practices in the regional between countries under same climatic and wildfire risk conditions.	MT	Lead Agency (as approved by Ministerial Council)
Assess the possible contribution of the insurance companies through a surcharge on insurance policies for natural hazards or others financial mechanism to contribute to prevention and recovery costs.	MT	Inter-ministerial (Council of Ministers)
Facilitate recovery process to build back more resilient communities and environment (cf planning).	MT	Lead Agency (as approved by Ministerial Council)
Create spaces that allow sharing emotions and validating lived experiences.	MT	Lead Agency (as approved by Ministerial Council)/ Local Authorities

3. Governance of wildfire risk management

As presented upon, this section covers the overall governance of wildfire risk management at the national and/or sub-national level. Actions proposed focus on the wildfire risk management policy and regulation, the horizontal and vertical coordination and cooperation among key stakeholders involved in wildfire risk management, wildfire risk financing strategies and systemic resilience.

3.1. Developing adequate governance & legislative framework

The DoF actions and its strategic planning[4] and forest law have been briefly presented in the IFM strategy document highlighting that the DoF has a key role in wildfire management but many others organisation have also responsibilities in wildfire risk management. If the Fire Service and the Civil Protection are also keys stakeholders in wildfire suppression, many others have a role to play, especially on the prevention and preparedness phases. An adequate governance and legislative framework would foster **long-term planning and investments on Integrated Fire Management** and facilitate **the development and enforcement of laws and regulations** concerning the use of fire, including clear rules for burning permit systems (legislation that regulates forestry and biodiversity management). We strongly advise **The Republic of Cyprus to consider promoting and regulating the use of prescribed burning, agricultural, traditional fires, and grazing.**

Fuel management programmes that determine the scale and location of mosaics and fuel breaks based on an appropriate analysis should be considered by **identifying Strategic Management Areas**, as well as landscape changes were needed (See Chap 4 for description of strategic management areas). The **need for more financial**

[4] Strategic Planning of Forest Department 2021 – 2023, https://www.moa.gov.cy/moa/fd/fd.nsf/fd48_gr/fd48_gr?OpenDocument

resources for fire prevention is highlighted. **Incentives and/or reduction of taxes for the urban cleaned areas** could be also an option proposed.

Along the lines of financial incentivisation, we highlight the importance of **valuing rural areas**, and activities and services of added value in the local communities. Potential such activities/services could include: sustainable and eco-friendly agroforestry products (e.g. honey, wax, tree-resin harvesting, forest-fruits' marmalades, wine, cheese, etc.), formats of low-intensity hotels (e.g. lodges, chalet-style cabins, yurt-style 'permanent tents', etc.), and formats of ecotourism. Regulated income and/or special tax and/or special funds could possibly further complement the incentivisation of the above.

Example of good practice in wildfire governance:
After the disastrous wildfires that occurred in 2017, Portugal took measures to implement institutional reforms aimed at improving an integrated management of wildfires. As part of these reforms, an integrated fire agency (Agência para a Gestão Integrada de Fogos rurais, AGIF) was established, which brought together conservation officials, the police, the armed forces, and private forestry firms to streamline both prevention and firefighting efforts. Additionally, a decree-law was passed in 2021 (Decree-Law No. 82 of October 13) that creates the Integrated Management System for Rural Fires (SGIFR), which is an integrated structure involving all entities in the area. AGIF ensures strategic coordination of the SGIFR. The National Plan for the Integrated Management of Rural Fires (PNGIFR), which was drafted by AGIF and approved through Council.

3.2. Assessing payment for environmental services

It's proposed to assess the possibility of putting in place **payment for environmental services mechanism**. This mechanism is especially used to better protect river basins of water resources used for potable water, facilitating development of organic farming and soil conservation techniques. These actions increase the quality and availability of water. Cyprus CAP strategy supports a similar mechanism as it shifts towards a new agricultural model, which respects the use of natural resources and commits to preserve and improve them with the aims of increasing the sustainability and resilience of the agricultural[5]

But **what about payment for fire prevention services?** Contrary to water, Cypriot citizens do not pay monthly for a fire service, at least not directly. Yet, a few proceed to infrastructures and life insurance against risks including (or not) natural risks, especially wildfire risk. In a few European countries, such insurance contracts contribute to a national fund for risk prevention. Would a similar fund be possible for wildfire prevention in the Republic of Cyprus?

In the region of Catalonia, north-est of Spain, a **specific scheme for an eco-service payment** is in development. As shepherds involved in grazing for wildfire prevention get specific constraints, they would be paid for their service in compensation of having to move their herds and having a probable lower production of milk. Since 2018, the Department of Climate Action, Food, and Rural Agenda of the Government of Catalonia has been offering an annual subsidy for fire prevention actions. Payment depends on two variables: managed hectares and the category of those hectares in terms of fire prevention. A financial mechanism to support shepherds could be also developed in Cyprus.

3.3. Develop supportive policy and legislation

Abandoned lands are mostly private lands. They are not forest but more brushlands that could eventually become a forest in a few decades. An adequate legislation should facilitate (and regulate) a better land management, especially in strategic management areas to better protect human stakes and Cyprus biodiversity.

For example, in Spain the private forest owners need to supply to the administration a forest management plan, especially in the Strategic Management Area identified as an opportunity to tackle wildfires. These plans identify the actions to put in place which could include controlled grazing for reducing fuel vegetation.

Other example in France where landowners are under **legal obligation to clear their land in specific fire-prone areas at specific time**. A GIS tool permits identifying if your land is affected by the legal requirement to clear bush (https://www.geoportail.gouv.fr/donnees/debroussaillement). If failure to clear the brush allowed a fire to spread that

[5] Cyprus CAP Strategic Plan

destroyed the property of others, you may be sentenced to up to 1-year imprisonment and €15,000 fine. If it's your home, your insurer can apply an additional deductible of a maximum amount of €5,000.[6]

In Cyprus, the Forest (amended) Law of 2018 dictates that any person who is not authorized by the Director of the Department of Forests and causes a fire in a State forest or within two kilometres of its fringes, as a result of reckless or negligent action or failure to take all necessary precautions, is guilty of an offense and is liable to imprisonment not exceeding 10 years and/or a penalty not exceeding 50,000€.

Building codes and vegetation management guidelines should be also developed to reduce the vulnerability of buildings and encourage or mandate the use of defensible buffer spaces. In addition, the housing policy should constrain the construction of houses on forest boundaries, which has been shown to dramatically increase the risk of fire, especially in the rural urban interface, as demonstrated by the recent fires (reducing urban sprawl).

3.4. Facilitate collaboration and ensure social diversity

Facilitating collaboration and connecting stakeholders is a key issue of Integrated Fire Management aiming at clarifying responsibilities of each stakeholder and facilitating complementarity of actions. The coordination could be done through a **Fire Management Committee**, which should be inclusive (e.g. gender-balanced, age/generations-representative, etc.) and quadruple-helixed; i.e. it should engage relevant competent Agencies/ Services of the Republic (e.g. Department of Forests, Water Development Department, Department of Agriculture, Department of Environment, Fire Service, Civil Defence, Game and Fauna Service, Town Planning, etc.), Representatives of the local Civic Society (e.g. Local Communities/ Townships, pro-environmental NGOs, Volunteer-groups, etc.), Local Financial Stakeholders (e.g. Companies, Agglomerations, Cooperatives, Representatives of Land-Owners, Businesses and SMEs, etc.), as well as Scientific Research and Innovation Actors (e.g. Universities and/or Research Centres). Participants of SEMEDFIRE workshops particularly highlighted the need for an overall “culture shaping” for the above, through capacity-building, training and coordination. Participants also highlighted the need to integrate research and innovation actors, so as to provide “independent” and “scientifically sound” counselling and guidance.

Unlike for water management, where there is funding via payments for water-supply and fees for sanitation services, the concept of “Fire Prevention” does not have specific financial “incomes”. As such, the above-described quadruple-helix collaboration should allow the sharing of resources available between Agencies/Departments/Services and Communities/Municipalities/Townships, as well as the mobilisation of organized volunteer-groups.

[6] More information on legal brush clearing in France: https://www.service-public.fr/particuliers/vosdroits/F33298?lang=en.

4. Wildfire risk assessment and communication

As presented previously, this section covers risk assessment processes addressing wildfire risk at the national and/or sub-national level. Actions proposed focus on the three stages of the assessment process (wildfire risk identification, analysis, and evaluation). They concern also the communication and sharing of results with key stakeholders and the with the general public.

4.1. Develop a better understanding of the fire risk in Cyprus

The wildfire risk analysis should focus on the vulnerability of people, buildings and ecosystems, especially using fire modelling. Social studies to better understand the ignition process would be needed to better target the communication campaign and reduce fire ignition during high wildfire risk days. **A single authority should be responsible for developing and/or coordinating wildfire risk assessment processes at the national level and across various sectors.**

The creation of a **technical working group on wildfire risk mixing governmental and research agencies** would improve data sharing to merge efforts and get more complementary projects. This working group would be able to support the creation of a clear GIS database on wildfire (probable cause, starting point, burnt area delimitation, vegetation fuel...) which should be shared to facilitate studies to improve fire prevention. Today, it's still very hard to get a complete database considering that there isn't one agency in charge of data collection.

The map below (Figure 2) presents a compilation of available data on fire in Cyprus (zone of responsibility of DoF, fire occurrence, possible cause, size and polygon of burnt area). This map has been produced by European University Cyprus, CERIDES. The dots are showing the starting point of fires, size is proportionate to burnt area and colour to possible causes (source: DoF, 2010-2020 and 2023, only for the areas under the effective control of the Government of the Republic of Cyprus). The black hatch indicates the areas burnt (source: EFFIS, 2008-2024). The green hatch areas are the public forests and the 2km buffer around, indicating where the Department of Forests is in charge of the planning and implementation of any measures deemed necessary to prevent forest fires (Cyprus Forest Law, 2012).

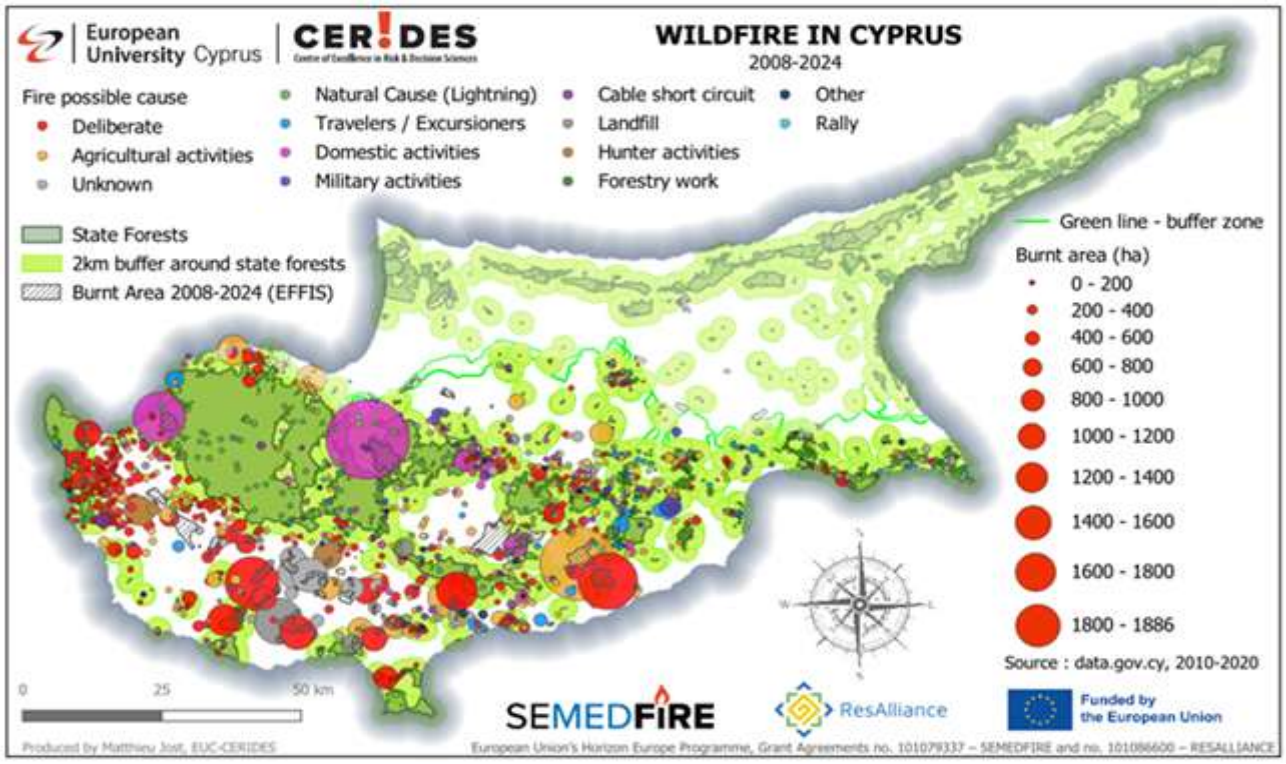

Figure 2 : Wildfire in Cyprus - 2008 to 2024, EUC-CERIDES

This map shows that wildfires starting from a natural cause (lightning) did not burn big areas whereas human activities are responsible for the vast majority of wildfires with a risk exacerbated in a climate change context, inducing higher temperatures and dry vegetation. Most fires started in rural and peri-urban areas where fire prevention is a shared responsibility.

4.2. Identify wildfire strategic management areas

Wildfire strategic management areas are land areas identified by wildfire experts (e.g. forest engineers and fire services) where vegetation management treatments should be carried out to change fuel models and prevent the occurrence of large wildfires. Strategic management areas are always defined within the territorial scope of an association of forest owners, Natural Park or forest massifs with the aim to carry out actions jointly with a landscape vision and thus optimise investments in forest management for fire prevention (Costa, et al. 2011).

The prevention of large forest fires through forest management allows optimizing management and extinction efforts and costs while fostering rural development. Considering that it is not possible to fully manage the agroforestry mosaic due to the lack of economic viability, the identification of strategic management areas allows land managers to focus economic resources on key areas where the efficiency of fire suppression will be higher, rather than allocating resources in all unmanaged forests.

A working session on strategic management areas happened in Cyprus in April 2024 leaded by Pau Costa Foundation and the DoF showed a real interest in this concept. Further actions to transfer this approach in Cyprus need to be planned beyond SEMEDFIRE project.

4.3. Improve risk communication to targeted groups

The objective of risk communication is to **reduce unplanned fires and losses by fire**. Risk-Communication should prepare populations and address in a specific way different target groups, such as scholars and specialists, rural population, wildland-urban interface population, tourists, general population, etc. An action plan must be defined to speak clearly to the general public, so that they understand wildfire hazard and what to do to better protect themselves and others.

Communication campaigns should **address all population groups (including tourists) about the advantages and disadvantages of fire use** in general, to permit reduction of unplanned accidental fires. Low-cost sustainable techniques and small-scale facilities should be promoted as an **alternative to burning** in rural production activities when the use of fire generates more negative than positive outputs. Such small-scale/low-impact techniques and facilities could potentially include house-level or neighbourhood-level composting, small-scale biorefineries (potentially providing the community then also with additional energy-supply), etc.

Figure 3 : Communication leaflet, DoF

Example of good practice in wildfire Communication:
In Cataluña, Pau Costa Foundation developed public awareness on land management through a partnership with Spanish Chefs and created a certification for products produced from participating herds aiming to make the end consumer more aware of the positive impact of consumption habits on reducing the risk of forest fires. For more information, see website : https://www.ramatsdefoc.org/en/

Participants of SEMEDFIRE workshops called for more awareness-raising activities targeting the population at risk, public debate, communication plan and strategies to be developed. These could be through local communication-&-information channels, including e.g. NGOs that could act as information points and dissemination-multipliers not only for the local population and residents, but also for visitors and tourists.

As presented in the Toolkit for fostering cocreation and participative community engagement with vulnerable communities at risk[7], there's a need to foster dialogue and participatory processes with communities around wildfire management. This toolkit also recommends facilitating and supporting (in)formal networks in the territory, promoting training for communicators to develop skills in participatory, and place-based communication as well as creating spaces that allow sharing emotions and validating lived experiences.

4.4. Input fire risk management in education strategies

Education programmes should be put in place regarding basics of landscape fire, environmental impacts, and fire use. Schools should also integrate **evacuation programmes for pupils/students.** The interactive stakeholders experienced **Pyropolis, a fire simulation serious game developed during SEMEDFIRE project to foster fire prevention and preparedness** is available for further development at local level to build-up fire management plan or for education purpose. It could be a useful tool to increase fire risk-awareness in schools. It could help children (and subsequently families) to develop a better understanding of the disaster-management cycle: Prevention - Preparedness - Response - Recovery. It would be an occasion to highlight that in this cycle everyone has a role to play, and not only in the response phase which is the focus of actual approach.

Pyropolis serious game could be adapted from feed-back received, for example it has been said there could be a stronger representation of NGOs and Farmers associations in the scenario, including especially fire volunteers. For education purposes, the game will need to present possible prevention or suppression actions to learn more during the game.

5. Wildfire risk management planning

As presented previously, this section covers the processes for planning wildfire risk management at the national and/or sub-national level, with the aim of managing and reducing wildfire risk. Proposed actions cover also the engagement of key stakeholders, the methods for identifying and prioritising wildfire risk management measures, the monitoring, evaluation and reporting processes, and the policy coherence with other key planning processes linked to wildfire risk.

5.1. Forest management plans

In Cyprus, the first forest management plans were drawn up during the English colonial period and focused exclusively on timber production. After independence, the drafting of forest management plans was limited to sensitive ecosystems of relatively high ecological value. With the inclusion of forest areas within the "Natura 2000" Network, the preparation of forest management plans becomes even more imperative to achieve the protection and rational management of habitats and species of wild flora and fauna. Precisely because of their utility in management planning, the development of management plans for all state forests has become legally mandatory as expressed in the Statement of Forestry Policy of 2013[8].

DoF targets preparation of comprehensive forest management plans for all state forests which cover all forest functions. Forest management plans are the basic tool through which the necessary measures, actions and projects are implemented to achieve effective and efficient forest protection and other management purposes. Preparation of forest management plans for private forests is also encouraged.

The forest management plans are prepared for an area with a total area of more than 100 hectares, while for areas smaller than 100 hectares management studies are prepared. Priority is given to the most important and sensitive areas, such as protected areas. The time horizon of each management plan or management study is ten years. However, extraordinary revisions will be made, when unforeseen events (fires) change the data and the purposes of the management of an area.

Forest management plans should be made more publicly available as well as the GIS data associated to facilitate implementation of prevention action by local stakeholders.

[7] EU PyroLife Deliverable D17: Toolkit for fostering cocreation and participative community engagement with vulnerable communities at risk, https://ec.europa.eu/research/participants/documents/downloadPublic?documentIds=080166e5f9f3b987&appId=PPGMS

[8] Statement of Forestry Policy of 2013 (*Original version available: https://www.moa.gov.cy/moa/fd/fd.nsf/fd16_gr/fd16_gr?OpenDocument*)

5.2. Improve community preparedness and resilience

The idea is to co-create adaptation pathways to reduce wildfire risk by valuing local knowledge and experiences as a strategic tool for adapting to wildfire, by creating spaces for social learning and amplifying/fostering the networking between participants throughout the process. The Pyropolis serious game created during SEMEDFIRE project could be used and adapted to participate to this social learning process.

Developing a resilient landscape through stakeholders' participation could contribute to the revitalization of rural areas. Actions not directly linked to wildfire risk could participate to this revitalisation like the use of green energy (awareness and income), the creation of a brand of local and regional farmers' products, the development of green areas to lower temperature, as well as the installation of green/solar roofs. **At community level, a climate holistic approach more than a wildfire focused approach would be more adequate, with a general objective of increasing the community resilience to climate change and related natural hazards** (including wildfire).

5.3. Ensure better land planning and define strategic management areas

Several land planning issues were raised while running Pyropolis serious game in SEMEDFIRE workshop in April 2024. Some with the objective of **facilitating intervention in case of emergency** and other ones focusing more on the **reduction of fuel in abandoned lands.** They are well interconnected with the goal of developing resilient landscapes including biomass management and preparedness actions.

Access for fire services is a key issue, and a forest fire analysis must be done to identify strategic management areas to ensure adequate opportunities for fire services to fight wildfires more safely. This analysis could also indicate key roads to maintain and if others must be opened. These roads (dirt paths) should be used by emergency services vehicles only but could also be accessed by tourists (hiking).

The development of more resilient landscapes could be achieved through an **agro-mosaic with more farming zones used as buffer-zones**, such as; vineyards or agroforestry plots or controlled grazing in forests. Farming ponds could also supply water in case of fire.

Evacuation and security plans should be developed at local level considering the diverse groups of people, different communication needs and knowledge levels, including the designation of gathering/rallying points.

6. Wildfire Prevention

As presented previously, this section covers important wildfire prevention measures aimed at reducing risks or mitigating adverse consequences of a wildfire event for people, the environment, and property, including cultural heritage sites. Proposed actions focus on the overall framework underlying the identification and implementation of preventive measures. It also examines the review of key landscape management measures, fire use laws, and guidelines in place, as well as their enforcement.

6.1. Prevention actions by Department of Forests

In order to reduce the probability of a fire to start, or to prevent the spread of an active fire, the following prevention measures are taken by the Department of Forests:

- Enforcement of the Law
- Provision of Picnic and Camping sites
- Education and publicity
- Fire protection plans
- Forest roads and Fire breaks
- Silvicultural treatments
- Water supply
- Landing spots for Helicopters
- Fire safety systems

We are not going to detail these actions but just underlined that these prevention actions should be also implemented over the DoF area of responsibility (public forests and 2km buffer around) where most of the wildfire start.

6.2. Promote and sustain vegetation management technics

The DoF indicate that vegetation management measures actually implemented in Cyprus for wildfire prevention are the following ones:

- Thinning and pruning of vegetation on both sides of the firebreak/road
- Cultivation of forest stands
- Opening/widening of firebreak/road
- Controlled grazing
- Controlled burning
- Cultivation of agricultural land

One of the key elements of vegetation management planning is the protection of communities from wildfires by creating a protection ring around each community. For implementing some of the measures on private properties, it may require obtaining consent from landowners or legislative regulation.

Vegetation management techniques should be more widely used and prioritized on strategic management areas. The idea of building volunteer teams for vegetation management has been submitted.

Example of good practice in wildfire Prevention:
In France, the legislation on wildfire prevention provides rules for legal clearing of woodland undergrowth (LCRs in title III, book I of its forestry code). The LCRs consist in most cases of clearing undergrowth on private land located less than 200 m from woods or forests, as well as a 20 m strip on both road shoulders open to vehicular traffic and railway tracks. In most cases, these obligations are the responsibility of private owners or the managers of infrastructures. Mayors, under their policing powers, must ensure that obligations are respected on their territory and can impose fines if rules are ignored. In addition, mayors in the departments concerned are advised to draw up a communal plan to prioritise the areas to be cleared of undergrowth and indicate that communes can provide for collective undergrowth clearance, carried out by municipal services and 're-invoiced' to owners. Four years ago, 32 provinces were subject to LCRs, number which today have increased to 46, in the aftermath of the increased risk of wildfire.

6.3. Developing controlled grazing in strategic areas

Cyprus has a lot of **abandoned and unmanaged land** with **numerous owners** of small parcels and is under similar **fire risk** conditions as Spain; with a dry climate and vegetation. Consequently, the **fuel materials** available in the forest and around the forest are high, with potential high slopes. This makes Cyprus an adequate land for transferring the practice of controlled grazing. Nevertheless, such practice is facilitated in Spain by the legislation in place requesting **forest management plans** for forest owners, especially in **strategic management areas**. Today nothing similar exists in Cyprus and an adequate **legal framework** would have to be developed to facilitate the implementation of controlled grazing for wildfire prevention which would most probably end in an update of the forest law.

This work is a governance issue needing a strong involvement of the government with a **potential leadership of the DoF** and adequate financial scheme to answer to the actual **limited availability of funds**. It also highlights the importance of **defining strategic management areas**, places where specific management practices should be put in place in priority to give more opportunities to tackle wildfire. The risk of **over-grazing** and potential **lack of water** should also be considered and livestock zones defined. Today, these strategic management areas are not defined in Cyprus but the DoF expressed a strong interest in this concept.

Lack of shepherds and lack of training opportunities for shepherds has been also expressed by SEMEDFIRE workshop's participants as an obstacle as well as the potential lower milk production in controlled grazing practice. Today the job of shepherds is not attractive enough. Nevertheless, there's a local demand for white cheese and sheep/goat/donkey milk, especially with the recent halloumi certification. This practice is easily scalable and could be started by a pilot project to facilitate the elaboration of an adequate framework with the governmental agencies. In addition, there's a clear need for a better management of abandoned lands and all stakeholders agree that actions should be taken! The Cyprus DoF also already have experiences in grazing the forest, especially in the region of Drouseia and PCF could further support capacity transfer from Fireflocks project in Catalonia[9] A project similar to

[9] Fireflocks synthetic presentation: https://eufarmbook.eu/en/contributions/662286fc09ab01702bca456d

Fireflocks in Cyprus could be an opportunity to promote shepherds, showing them acting for wildfire prevention to protect population and biodiversity more than the ones responsible for the biodiversity losses by overgrazing.

Protect and support local biodiversity: Stakeholders working on biodiversity preservation should be included from the beginning to avoid overgrazing but also to facilitate the implementation of controlled grazing that may need environmental authorization in specific areas. For biodiversity stakeholders, controlled grazing should be seen not as a treat but as a chance to protect it. Nevertheless, specifications should be developed with the biodiversity experts to insure adequate grazing.

6.4. Assessing the potential use of prescribed fire

An additional vegetation management measure which is widely used for wildfire prevention around the Mediterranean basin is prescribed fire / controlled burning. **As indicated in the Cyprus Wildfire Prevention Law of 1988 (220/1988): burning vegetation residues is possible between December 1st and March 15th with permission from the DoF**. And the Forest Law of 2012 indicates that any person who is not authorised and lights a fire within a public forest or within 2 km of its fringes is guilty of an offence and is liable to imprisonment not exceeding 10 years and/or a fine a penalty not exceeding €50,000.

If not clearly explained, we could understand here that a person could be authorised to light a fire which would open the possibility of prescribed fire. Nevertheless, the forest law would need to be amended to clarify the framework and conditions. Today the DoF does not receive any request, but agricultural/traditional fires are commonly used.

To better assess the feasibility of prescribed burning in Cyprus, Pau Costa Foundation supported EUC-CERIDES to organize a demonstration on prescribed burning on Mars 2025. This event has been a great success and the DoF is willing to further develop prescribed burning in Cyprus. A few staff of the DoF should participate to an adequate training organised by PCF in November 2025 to plan and organize further prescribed burning in Cyprus for the end of the year and beginning of 2026.

7. Wildfire Preparedness

As presented upon, this section covers important wildfire preparedness measures aimed at establishing a state of readiness and capability of human and material means, structures, communities and organisations for ensuring an effective, rapid response to a wildfire event, achieved through advance action. Proposed actions focus on the overall process supporting the identification and implementation of preparedness actions, but also present key preparedness measures linked to contingency planning processes, early warning systems, training, exercises and international exchanges, and development of response capacities.

7.1. Preparedness by Cyprus Department of Forests

For the detection and early reporting of fire incidents the following measures are taken by the DoF:

1. Fire Lookout stations
2. Ground patrol
3. Air patrol-Airplane and Drones
4. Automatic fire detection system
5. Information from the public and other Government Services
6. Telecommunication system

Figure 4 ***: Ground patrol, DoF***

Figure 5 ***: Lookout station, DoF***

Figure 6 ***: Fire detection system, DoF***

Figure 7 ***: Drone patrolling, DoF, Cyprus***

Figure 8 ***: Airplane patrol, DoF, Cyprus***

7.2. Wildfire preparedness guidelines and contingency plans

Guidelines and technical documents dealing with the implementation of risk preparedness measures should be in place. Regulations and guidelines dealing with the development and implementation of contingency plans at different territorial levels (national, sub-national, and local) should exist and be effectively enforced. Wildfire contingency plans should be regularly revised and, if necessary, updated after major wildfire emergencies. Procedures and/or guidelines dealing with methods to review, update and evaluate contingency plans should be in place.

In addition, early warning communication systems should be defined by using an inclusive, community-based approach. Specific social-cultural needs and the needs of the most fragile groups should be addressed.

EXAMPLE OF GOOD PRACTICE IN WILDFIRE PREPAREDNESS:
Forest Forecasts could be also a useful tool to communicate on wildfire risk, depending on the present and forecast weather conditions. With the aim of preventing fires that everyone adapts their behaviour according to the foreseeable fire danger, Forest Weather indicates a level of danger of forest fires established from weather forecasts and the dryness of the vegetation. Example of the French Météo des Forêts by Météo France.

7.3. Improve pre-detection strategy by incorporating volunteers and innovation

As communicated by the DoF, the average response-time to a fire by the Fire Service and DoF is quite short (around 12 minutes). Nevertheless, it is crucial that the fire is detected at the early stages. As such, there is improvement that

could be achieved in pre-detection. Bureaucracy, segmentation of responsibilities, limited financial resources, limited knowledge transfer and flexibility in adopting technological tools (sensors, drones, smart agriculture…), are potential barriers for improvement.

To improve preparedness and early detection, trained volunteers could be engaged to support forest monitoring (potentially monitoring biodiversity as well). It would need to develop training for fire volunteers' teams in prevention and pre-suppression actions and improve coordination mechanisms with authorities. This would be facilitated with the creation of a legal framework to register volunteers, train them, and ensure their safe and adequate participation in fire management in prevention and pre-suppression actions.

In terms of incorporation of innovative technologies; **dense networks of low-cost specialised sensors** could be established throughout the forests (i.e. thus detecting early the exact location of ignition and warning immediately nearby and/or central response-stations), in combination with unmanned systems further supporting surveillance and early-warning, as well as potentially facilitating even early-intervention. For example, there could be unmanned ground vehicles "patrolling" and "ready to respond" if the ignition-point is close by, as well as unmanned aerial platforms (copter-style and/or fixed-wing) which could be providing aerial surveillance and even rapid-response if properly equipped and happening to fly close to possible ignition.

1.4. Develop a training program and joint exercises

Different institutions/teams should participate in joint training to enhance interoperability and cooperation (e.g. armed forces, civil protection, fire brigades, forest services, forest owners, volunteers).

The private sector, in particular owners and operators of infrastructures or systems that provide essential services should be trained and participate in joint training programs.

Different types of exercises should be organised on a regular basis: full-scale (FSX), table-top (TTX), command-post (CPX). Population, community volunteers and civil society organisations, as well as the private sector (in particular owners and operators of infrastructures or systems that provide essential services), should be involved in exercises.

8. Wildfire emergency response

As presented previously, this section covers activities and processes related to the response phase of a wildfire event. The proposed actions focus on process for assessing needs and impact, response operations, vertical and horizontal coordination processes.

8.1. Operational fire suppression plan

The Forest Strategic Planning includes the development of operational fire suppression plans depending on the risk of explosion and spread of fires as well as an Incident Command System. To control forest fires the sooner possible with minimum losses, a number of suppression measures are taken by the DoF through its internal firefighting task force, forest staff, training, firefighting tools, fire engines, crawler tractors, air means. The average response time registered from 2000 to 2023 is around 12 minutes indicating the effectiveness of the fire control system that is implemented in Cyprus.

8.2. Improve inter-agency collaboration

In Cyprus, there's a need for improving civil protection organisation to better cope with wildfire, floods, droughts and extreme weather events (hail, heat waves). It's a very transversal subject deeply linked to governance but also to management practices, technology and innovation issues. Improvement needed cover early warning systems, use of technological tools, forecasting, assessment of damages and collaboration of the various agencies and services (Civil defence, Department of Forests, Department of Agriculture, Water Development Department, Department of Public Works, local communities and municipalities, Fire Services, civic society and volunteers' organisations). Fire management interconnects with many stakeholders in many disciplines and there's a need to clarify responsibilities for each stakeholder. For wildfire suppression, the DoF is in charge inside the public forests (+2km around) and the Fire brigade responsible anywhere else. But responsibility for wildfire prevention outside of a public forest (+2km around) need to be clarified. To be noted that in the framework of SEMEDFIRE project, with the support of the French Civil Protection (WP6) and Nimes Metropole, further work is planned on interagency cooperation which will bring complementary information.

9. Recovery and lessons learned

As presented previously, this section covers important wildfire recovery and review processes implemented in the wake of a major wildfire event. It focuses on the post-disaster phase and addresses the implementation processes of recovery and restoration plans, the build-back-better adaptation and climate proofing processes, and the lessons learned procedures in place to identify good practices, areas for improvement and wildfire risk management measures needed to mitigate risk and strengthen resilience.

9.1. Rehabilitation of burned and other degraded areas

Large tracts of land, especially private forestland, are burned every year and in some cases before the ecosystem reaches maturity. Other important degradation factors are grazing (at least in some areas), quarrying as well as mining in the past. DoF targets restoration of the vegetation and the landscape with appropriate techniques in burned and otherwise disturbed and degraded areas as soon as possible, to restore the original ecological and aesthetic characteristics to the greatest extent possible and to prevent their further degradation.

DoF ensures immediate restoration of burned state forest lands following natural processes as much as possible and providing incentives and support to local authorities and owners of burned private lands. Actions from DoF also include regulation of grazing in areas degraded by overgrazing, restoration of the environment in old mines, quarries and other degraded areas, as well as establishment of vegetation in areas threatened with desertification. During the selection of the species, the use of species that are beneficial for the local fauna and beekeeping is also considered.

Figure 9 : Post Fire Management - Restoration works of burnt areas - anti - flood works

Figure 10 : Photos: Post Fire Management - Ground preparation and planting by volunteers, DoF

Figure 11 : Artificial regeneration, DoF, Cyprus

Figure 12 : Natural regeneration, DoF, Cyprus

9.2. During recovery phase, build back more resilient!

We highlight the work done by the Department of Forests and Water Development Department on the recovery phase to facilitate soil and water retention. A publication on work done after Arakapas fire in 2021 has been produced and is available on ResAlliance website[10]. After analysis of the fire ignition and spread of fire, the recovery phase is a phase of reconstruction, an adequate time for inputs to reduce vulnerability. After such a disaster, the population impacted is more eager to adapt and specific measures could be put in place to support local authorities to build back more resilient.

9.3. Ensure application of lessons learned

Cyprus has many occasions to test procedures and to identify good practices or areas for improvement as wildfires happen often. Each wildfire highlights weaknesses. For example, the Paphos 11th of June 2024 wildfire highlighted the issue about illegal dumps spread around Cyprus as the fire appears to have started in an illegal rubbish dump. Then a discussion started on how to manage and avoid the illegal dumps. After each big wildfire and after each fire season, a shared debriefing is necessary to identify potential reasons of success to highlight good practices but also weaknesses on which specific wildfire risk management measures would be needed to mitigate risk and strengthen resilience. Fire services are every year under a huge stress during the fire season and building-up from their experiences is needed to improve their conditions of intervention and chances of success in the fire battle.

[10] On-stream ponds for soil retention on burnt or degraded areas, EUC-CERIDES, 2024: https://eufarmbook.eu/en/contributions/6644d34aa613cc9ed34a0a1b

10. Conclusion

The elaboration of this document has been possible with the participation of more than 100 persons which gave their inputs during participative workshops. Half of these participants were coming from 20 different governmental agencies (list in Chapter 11). If the stakeholder's engagement plan proposed in this document is not a governmental action plan, but it has been build-up in strong relationship with governmental authorities.

Taking this in account, we could highlight two points. Firstly, the aim of integrated fire management and the possible actions have been presented and discussed in workshops so the stakeholders involved are awarded of the need of change in wildfire management and know about the potential solutions and actions that should be implemented, briefly presented in this document. The output of SEMEDFIRE project is not just the content of this document but the fact that its content is partly known by key stakeholders of wildfire management in Cyprus.

Secondly, the content of this action plan is not just academic recommendations on what should be done to put in place integrated fire management in Cyprus, but also actions proposed by Cypriot stakeholders responsible of the improvement of wildfire management in Cyprus. Tacking in account that half of the participants were governmental authorities, we could believe that there's a willingness and capacity to put these actions in practice. Nevertheless, the precise definition and timing of these actions as well as the potential "responsible for action" still need to be discussed, elaborated, and then finally validated at the appropriate decision-making level (e.g. Council of Ministers).

We especially highlight that this action plan is inter-ministerial and that to be confirmed, validated and implemented, it needs a lead agency to facilitate the process and follow-up. Today the Department of Forests has the main role in forest fire management and should continue to be the main stakeholders for prevention and suppression of forest fires. But we believe that facilitating an integrated wildfire management on the full territory of Cyprus is another cap for which the DoF would need support especially in governance, planning and communication.

Finally, we want to highlight that a strong connection should be developed with other action plans on risk management and climate change adaptation. At the local level, building an action plan to increase the resilience of the community and its environment, responsibility of the local authorities, should consider all the natural risks and improve the landscape resilience to wildfire risk.

EUC-CERIDES strongly encourage and will support the organization of another participative workshop with governmental authorities to end-up this action plan and continue discussion on how to adapt the plan to facilitate its effective implementation to better protect lives, infrastructures and ecosystem of Cyprus from large wildfire.

11. List of participants

The organizations listed below have been involved in one or more workshops of SEMEDFIRE and ResAlliance to develop this integrated fire management strategy, and we thus thank them for their active participation and essential contributions. We specify, however, that opinions expressed in this document are SEMEDFIRE consortium's observations, derivations, and statements, and do not bindingly engage any stakeholders of the below list.

This list also expresses the diversity of stakeholders involved.

Name of the organization	Number of persons involved
Business and Industry	**8**
Cyprus Chamber of Commerce and Industry	1
ENVI Services Ltd	1
Geomatic	1
Inntenet	1
Things Green AE ltd	2
Self-employed	1
Kitasweather	1
Civil society organization	**10**
BirdLife Cyprus	1
Friends of the Earth	1
Laona Foundation	2
Terra Cypria	3
Phoenix	1
Paradisiotis LTD	1
KEMA	1
Farmers & representatives	**7**
Euroagrotikos	1
New Agricultural Movement (NAK)	1
Panagrarian Union of Cyprus (PEK) - Farmers Union	3
Panagrotikos Agricultural Association	1
Union of Cypriot Farmers (EKA) Agricultural Association	1
Government & local authorities	**51**
Civil Defense	7
Cyprus Deputy Ministry for Tourism	1
Cyprus Organization Of Agricultural Payments (CAPO)	1
Defense Fire and Rescue Service	2
Department of Agriculture	5
Department of Environment	6
Department of Forests	7
Department of Meteorology	2
DG Growth - Director of Directorate for Sustainable Development	1
Fire Brigade	2
Game and Fauna Service	2

Ministry of Agriculture, Rural Development and Environment	1
Office of the Commissioner for the Development of Mountain Communities	1
Office of the Minister of Agriculture, Rural Development and Environment	2
Platres Community Council and Troodos Network of Thematic Centers	1
Sewerage Board of Limassol-Amathus (SBLA)	1
Water Development Department	5
Office of the Commissioner for the Environment	3
MARDE - Directorate General for the Environment	1
Research Community	**11**
Agricultural Research Institute (ARI)	2
Cyprus University of Technology - Eratosthenes Centre-of-Excellence	2
Eratosthenes Center of Excellence	3
Frederick University (Nature Conservation Unit)	1
KES Research Center	1
Open University of Cyprus	2
Partners	**26**
European University Cyprus - CERIDES	14
Wageningen University, the Netherlands	4
Pau Costa Foundation, Spain	3
DGSCGC, France	3
Nimes Metropole, France	1
EMYS, Spain	1
Imperial College of London, UK	2
AGIF, Portugal	1
Others	**2**
Ambassade de France à Chypre	2
Grand Total	**118**

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