20-30 NATIONAL PLAN FOR INTEGRATED RURAL FIRE MANAGEMENT

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AGIF
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01 INTRO-DUCTION

01

The 2017 rural fires[1] affected citizens and natural and built heritage, leaving in their wake a devastation never before seen in Portugal or any other western Europe or Mediterranean country. The discussions held after 2017 resulted in an agreement on the systemic weaknesses identified by the Independent Technical Committee (ITC1), some of which deep-rooted and known, such as the lack of prevention or failure to integrate knowledge with management operations. The scale of the tragedy and the resulting social clamour demanding that such a tragedy not be repeated required an ambitious approach, drawing on all available national capacities and the best international knowledge available to reduce the occurrence of rural fires and the resulting damage to acceptable levels from an environmental, social and economic perspective.

Both the reports drawn up[2] and the discussions held in society and among experts widely recognised that the more severe and frequent fires are the result of the over simplification of a complex problem, where the main solutions and investments (improvement of the road network, more water points, rapid fire detection and suppression), although effective in the short term, have the opposite effect in the medium term since they overlook vegetation build-up and distort the people's perception of the risk[3]. Prevention failed, it was said repeatedly, in a system that mitigated the consequences but neglected to tackle the root of the problem.

Given the complexity associated with the engagement and commitment of all stakeholders – not only public entities but also, in particular, the private entities who own the majority of the

[1] In different biotas it is known as Wildfire, Bushfire, Rural fire, Forest Fire or Wildfire, as fire is understood to be the simultaneous release of energy, light and flames as a result of the uncontrolled combustion of flammable materials in space and in time, in rural, forest or bush land.

[2] Independent Technical Committee (2017) 'Analysis and determination of the facts surrounding the Pedrógão Grande, Castanheira de Pera, Ansião, Alvaiázere, Figueiró dos Vinhos, Arganil, Góis, Penela, Pampilhosa da Serra, Oleiros and Sertã fires, between 17 and 24 June 2017'. Lisbon, Assembly of the Republic, 297 pp.; Independent Technical Committee (2018) 'Assessment of the fires that occurred between 14 and 16 October 2017 on Continental Portugal. Final Report. Independent Technical Committee'. Lisbon, Assembly of the Republic, 274 pp.; Viegas *et. al* (2017) 'O complexo de incêndios de Pedrógão Grande e concelhos limítrofes, iniciado a 17 de junho de 2017', ADAI/LAETA, University of Coimbra, Coimbra.

[3] A risk is deemed the potential loss associated with the vulnerability of an element exposed to a phenomenon, taking into account the susceptibility of an area to that same phenomenon, and the likelihood of it occurring.

Portuguese territory – , it was imperative to establish an Integrated Plan that included a strategy and action plan, with the involvement of all agents, with the purpose of making severe rural fires in Portugal a rare event.

This challenge was embraced in 2017 by the Task Force for the Installation of the Integrated Rural Fire Management System (NPIRFM) with the hosting of an international meeting where information was gathered on the best practices implemented in other countries with similar problems. In the first quarter of 2018, a study was conducted on the model that was in place until 2017, on the outline and requirements of the new Integrated Rural Fire Management System (IRFMS) and the organisation thereof, taking into account the guidelines set out in Resolution of the Council of Ministers No. 157-A/2017, of 27 October 2017, defining the structural changes for rural prevention and suppression, lending substance to the ITC1's proposals. In light of this alignment, the strategy and mechanisms for the 2018 fire campaign were designed and AGIF played an active role in the work of the Portuguese National Planning Program (PNPOT), which this 2020-2030 National Plan for Integrated Rural Fire Management supplements.

With the formal start of the project teams' work, from July to September 2018, public entities were asked to give their input as to their ambitions, proposals and contributions, which were consolidated in a joint development with the broad participation of the State's Central Administration. Once the vision and strategic goals had been defined, work and reflection sessions were held with public and private stakeholders, consolidating the diagnosis and gathering proposals for measures for each one of the strategic goals defined.

The Independent Technical Observatory (ITO), formed in late 2018 at the Portuguese Parliament, was involved since the consultation for the submission of proposals for the plan arrangement[4]. The ITO drafted technical studies, reports and information notes[5] intended to improve the aforementioned documents.

[4] Meetings held on 23/11/2018, 7/2/2019 and 24/11/2019.

[5] On the forest planning plan (February 2019); assessment of RCM 12/2019 (March 2019), the analysis of the ICNF and ANEPC's organic laws (April, 2019) and, finally, the opinion on the 2030 strategy, as part of the public debate.

As provided for in Resolution of the Council of Ministers No. 12/2019, of 21 January 2019, the Agency for Integrated Rural Fire Management (AGIF, I. P.) delivered the first version of the National Plan for Integrated Rural Fire Management (NPIRFM) to the government on 7 March 2019, and several meetings were held thereafter to gather the input from public entities and their supervisory authorities, while at the same time plenary, bilateral and sector-specific technical consultation meetings took place.

The strategy and process chain documents approved by the Council of Ministers on 5 December 2019 were made available for public consultation for sixty days on the consultalex.gov.pt website. During this period, 73 nationwide Q&A sessions were held, which were attended by more than 2,000 people. One hundred and fifteen written contributions were received, enabling the improvement of the documents made available for discussion and a significant improvement of the National Action Plan.

Given that this is an integrated plan, with the participation and involvement of all stakeholders in the process, the solution presented includes the key contributions and proposals following public consultation, thereby consisting of the 2020-2030 Strategy and Action Plan.

The 2020-2030 Strategy establishes the vision and values, identifies the context, defines the strategic guidelines and goals, sets targets and introduces a new governance and risk management model, detailed in the individual process chain document.

It is based on this strategic underpinning that the Action Plan develops, sets priorities and details the course of action, or projects to be implemented, with the respective timing, budget and entities primarily responsible and stakeholders, incorporating and also enhancing measures that have been implemented in the past two years.

Portugal's pledge to carbon neutrality by 2050 is also of note. For this to happen, the country's carbon sequestration capacity will have to grow by 13 million tonnes per year, an amount which implies reducing the area burned every year in rural fires by half. Given the temperature rise known today, we must achieve this goal as quickly as possible.

The NPIRFM proposes the establishment of a regional Action Plan, to be implemented gradually and without interrupting operation of the system during the phased implementation, based on the processes identified as being a priority and using, where appropriate and possible, *ad-hoc* pilots and programmes allowing a validated and sustainable implementation. This process is all the more so relevant knowing that the Integrated Rural Fire Management System (IRFMS) will be arranged territorially in the NUTS II and NUTS III territories, which requires the development of institutional coordination mechanisms aligned with this territorial organisation, anchoring the transition in a change-based management programme based on territorial pilots, jointly involving the Institute for Nature Conservation and Forests (ICNF, I. P.), the Republican National Guard (GNR), the National Emergency and Civil Protection Authority (ANEPC), the Armed Forces, local authorities, fire brigades and Forest Producer Organisations (FPO).

Moreover, implementing the IRFMS and its respective process chain[6] requires review of the legislative acts that established the earlier mechanisms, namely Decree-Law No. 124/2006, of 28 June.

The 2020-2030 strategy and action plan for the NPIRFM establishes 2019 as the base year of implementation, during which the initiatives provided for under Resolution of the Council of Ministers No. 157-A/2017, of 27 October 2017, will be carried out, along with those defined in the action plans of the various public bodies, in the National Budget Law and other legislative acts, as well as separate initiatives that are subsequently published aimed at mitigating weaknesses identified over time.

[6] Document Defining the Process Chain of the Integrated Rural Fire Management System.

02 VISION, MISSION AND PRINCIPLES

02

The National Plan for Rural Fire Management (2020-2030), its Strategy and Process Chain (this document) and the Action Plan aims to fulfil the Vision where Portugal is expected to be after 2030.

VISION

This shared vision, *of a* ***Portugal protected from severe rural fires***, allows us to embrace the challenge with determination and confidence, knowing that only by working together will we achieve the intended goals.

This vision acknowledges that rural fires cannot be completely avoided and, as such, we must prepare the territory, the people and operational personnel to work the land in a way that improves safety for all, while at the same time using fire[7], in a technically sustainable manner, as an environmental factor commonly used in agricultural, forest and habitat management.

With a focus on prevention, by educating and raising awareness among communities to change behaviours and with an ambitious vegetation management programme, any severe rural fires that may occur will be in fewer in number, destroy much less property and will be a lesser threat to people's lives and safety.

This vision sees fire as a tool for managing wild land and an ecological element, provided that technical fires are used, encouraging its replacement as a tool for eliminating scrublands and slash with alternative solutions, such as collecting slash for energy generation or composting.

[7] Fire is understood to be combustion characterised by the emission of heat accompanied by smoke, flames or both.

MISSION

This vision is in line with the mission to ***protect people and property from rural fires and develop wild land, ensuring ecosystems are properly tended to by*** identifying strategic guidelines and their respective goals, for which a unified action plan and projects for the 2020-2030 period must be continuously implemented, replacing the current National Forest Fire Protection System (SDFCI).

The IRFMS and its processes are designed for greater simplicity, flexibility, specialisation and rigour, allowing the entities to see the results of their actions by using integrated resources and efforts at the service of the community, in strict collaboration therewith, to carry out complex operations efficiently and effectively.

The NPIRFM applies to the entire territory[8], linking all public and private entities and all citizens and encouraging them, through an action programme with sufficient resources, to fastidiously undertake their responsibilities and duties.

PRINCIPLES

The IRFMS is based on principles that embody its culture. This culture should be internalised by the various entities involved in the IRFMS, and by citizens. It is embodied in the initiatives of the entities for the community and the action of citizens to ensure their own safety.

The principles governing IRFMS initiatives are described below, are in line with the principles of the Food and Agriculture Organization (FAO) (2006):

[8] The development of a process is recommended for the planning and scheduling of specific initiatives for the Autonomous Region of Madeira during 2020, adapting the strategy, process chain and the 2020-2030 action plan according to the needs identified with the RAM.

1. CLARITY OF PURPOSE

Each initiative carried out under the IRFMS must clearly be included in the strategy approved at national level and support the established goals. The responsibility and commitment of each of the entities that make up the system and the coordination between them must be clear, just as the way in which their intervention *fits in at territorial level* and how it serves the national strategy must be clear to the agents, whether organisations or individuals.

2. AWARENESS OF THE COMPLEXITY OF THE MISSION

Each initiative carried out under the IRFMS must ensure that it is part of an integrated prevention and suppression management strategy, guarantee that the upstream assumptions are ensured and assess the downstream effects of the respective initiative, establish the partners involved and the circumstances under which it develops. Acting in such a complex environment, with multiple interconnected variables, implies creating virtuous cycles that combine the maximisation of the rural space, effective and sustainability-oriented subsidisation, a better weight distribution of income among owners, appropriate structuring and registration of forest property, better supervision, better knowledge of land use and the necessary behavioural changes.

3. ACCOUNTABILITY

Each initiative carried out under the IRFMS requires prior clarification of the responsibilities of the different System components, in all stages of implementation, thereby ensuring the appropriate allocation of resources needed (e.g. financial, human and other resources) and the corresponding coordination between the various entities, focusing particularly on inter-ministerial cooperation, ensuring the ultimate responsibility and authority lies with the central structures for planning and control. The responsibility undertaken by the different territorial levels (national, regional, sub-regional and municipal) of the System reflects a high level of transparency that allows for the delegation of powers to those on the ground and the consequent mobilisation and accountability of regional and local agents.

4. SUBSIDIARITY

An initiative is always carried out as close to the area in which its effects are to be produced, with intervention by a higher hierarchical or organisational level only occurring when there is a lack of response or the inability to carry out the initiative. No central level entity will intervene until all lower levels have exhausted their capacity.

5. COOPERATION

Each initiative carried out under the IRFMS must ensure the necessary cooperation and coordination of efforts between the various System entities, both at central and local level, in prevention and suppression, through strategic and operational coordination. The System requires cross-cutting coordination between the different ministries and central bodies and selectively decentralises their intervention, thereby ensuring coordination and supervision on the ground and the involvement of local agents and owners.

6. COMPETENCE

Each initiative carried out under the IRFMS must incorporate the most relevant scientific knowledge and international best practices in the design and implementation thereof. Each entity must invest in the training of its human resources and in the technical upgrading of its equipment and processes so as to ensure an increasingly effective, efficient and capable system.

7. EXPERIENCE

Each initiative carried out under the IRFMS must incorporate lessons learned from previous initiatives, implementing the solutions that proved appropriate, correcting identified errors and endeavouring to maximise results. More than rewarding or penalising, the evaluation of each initiative must aim primarily at learning from the experience and from mistakes to move on to the next initiative. The benefit of experience lies not in establishing a routine, but in the ability to take a critical look at past initiatives, identify mistakes made and use that knowledge to improve future practices.

8. FLEXIBILITY

Each initiative carried out under the IRFMS, whether for prevention or suppression, must follow the approach most suited to the type of threat, the property at risk, resources available, the landscape, the type of property, weather conditions, the crops of the institutions and communities in question, and have a flexible command system that takes possible changes in these conditions into account and is capable of adapting to them and ensuring the necessary adaptation of all other agents involved.

9. BALANCE

Each initiative carried out under the IRFMS must have a clear link to the targets set, ensuring a balance between prevention and suppression activities so that individual synergies do not take precedence over the whole. System stability through the participation of each entity will determine much of the success of the outcomes and will guide the strategic commitment of each organisation.

03 THE FOUNDATION FOR CHANGE

In 2017, one hundred and seventeen lives were lost and dozens of people were injured during the fires that occurred at that time. Hundreds of homes and industries, agricultural structures and machinery were destroyed, animals were lost and the country gained an undeniable sense that fires with devastating consequences way beyond what the people were used to seeing on television are real. Moreover, it become abundantly clear that this problem, usually referred to colloquially as being limited to forests, was anything but. These fires ignored the boundaries of forest occupation. More than forest fires, they are rural fires, affecting both uncultivated and farm lands and, in some cases, even green urban areas.

The seriousness of what happened in 2017 poses a renewed challenge to Portugal. Renewed because it is not new, in so far as severe rural fires had already occurred in 2003 and 2005 which, at the time, saw several reports drawn up and public debates held on the matter. So much so that in 2017 the fires did not catch the country completely unawares. Indeed, Resolution of the Council of Ministers No. 65/2006, of 26 May 2006, approved the National Forest Fire Protection Plan (PNDFCI), the purpose of which was to ensure that the national territory was protected against rural fires focusing on 5 strategic pillars: i) increase territorial resilience, ii) reduce the occurrence of fires, iii) improve the effectiveness and efficiency of fire suppression, iv) restore and rehabilitate ecosystems and communities, and v) adopt an efficient organic and functional structure.

NATIONAL FOREST FIRE PROTECTION SYSTEM (2006-2018)

There was a system in place in 2017 and at the time this chapter was written. A system that, according to that same PNDFCI and to Decree-Law No. 124/2006, of 28 June 2006, is based on three pillars of action: one for structural prevention, overseen by ICNF, I.P., an intermediate pillar for surveillance, detection and inspection, overseen by the GNR, and, finally, the suppression,

mop-up and fire surveillance pillar, overseen by ANEPC[9]. In 2006 this system was known as **the Forest Fire Protection System (SDFCI)**.

Under the SDFCI, ICNF, I.P., vested with the functions of national forestry authority and the pillar of prevention, is responsible for coordinating the planning and monitoring of the implementation of the PNDFCI. It was incumbent upon ICNF, I.P. to define the principles and methodology for designing municipal sector plans which would assess and approve, and also replace the civilian governments in district sector planning. ICNF, I.P. was also given the responsibility of monitoring the development and use of forest fire protection systems (RDFCI) which comprises all the rural forest fire protection infrastructures and the implementation thereof (or development of the instruments required for implementation) and all preventive interventions on the lands it directly managed.

The GNR, responsible for coordinating prevention, surveillance, detection and inspection, in the overlap between the SDFCI and the Integrated System for Protection and Relief Operations (SIOPS), approved by Decree-Law No. 134/2006, of 25 June 2006, permanently made available decision support information to the national and district civil protection commands through their military personnel posted there. Operational prevention initiatives are coordinated by forming a Forestry Information Maintenance and Exploitation Team (EMEIF) which works together with each district command, with the GNR also ensuring the operation of the National Lookout Tower Network (RNPV), forest patrols and fire suppression interventions. The GNR also plays a key collaborative role in the implementation of exceptional measures included in the declarations of a State of Alert issued pursuant to the Basic Law on Civil Protection and also collaborates when required by the engagement plans, or when the seriousness of the situation so requires, always as part of the respective command and within the framework of specific legislation.

It is incumbent upon ANEPC to plan, coordinate and implement emergency and civil protection policies (namely for prevention and response to major accidents and disasters), policies for the

[9] This paragraph refers to the current names of the entities that replaced those that existed in 2006 when the PNDFCI and the aforementioned legislative act were approved. ICNF was then known as the Directorate-General for Forest Resources (Direcção-Geral dos Recursos Florestais), and ANEPC as the National Civil Protection Authority (Autoridade Nacional de Proteção Civil).

protection and relief of populations and those for the coordination of civil protection officers, as provided for by law. ANEPC is, therefore, competent and responsible for the cross-cutting organisation and coordination of all civil protection operations that significantly exceed the domain of rural fires and coordinates the suppression pillar, as established under the SDFCI.

As indicated above, this model is still in force and aims to prevent, detect and suppress fires. To this end, it was consolidated by means of vast and increasing annual public expenditure which, for 2016, is estimated to have reached €143 million[10]. With only about 20% of the annual budget earmarked for prevention (if one considers the average annual expenditure to be €31 million for 2016), the reduction of the fuel load in forests and scrublands was insufficient, although there was a slight change in the behaviour of the population, demonstrated by the reduced number of ignitions (<5%/year). Improved detection, surveillance and suppression also resulted in a system that ensured a better initial attack: 96% of ignitions become fires covering less than 10 ha. However, the concentration in 2 to 3 weeks of the year of only 4% of uncontrolled ignitions explains more than 90% of the burned area. We know that the more demanding situations occur over a few days of the year, when weather conditions decisively limit ignition, progression, effective prevention and successful suppression (Pereira *et al.*, 2005; 2006, Trigo *et al.*, 2006, 2013).

When the PNDFCI was in force (2006-2018), the number of ignitions[11] trended downwards, but the burned area indicators were below the targets set for 2012 and 2018, e.g. the total annual burned area could not be kept below 100,000 ha nor could the annual burned area in forest stands be kept consistently below 25,000 ha of stands[12]. Other targets for the period, such as reducing the number of rekindles and eliminating fires spread across more than 1,000 ha, were never reached[13]. Although initial attack and surveillance improved, prevention in forests was not

[10] Source data 2016: ICNF and FFP activity report, CTI annex 8, aligned with the EMSGIFR Team; data provided by the GNR; data provided by ANPC.

[11] The average number of ignitions between 2006 and 2012 was 21,465, and between 2013 and 2018 stood at 13,843, 35.5% less than the previous period.

[12] 25,000 ha corresponds, approximately, to 0.8% of the forest stands, the target set for 2018 under the PNDFCI.

[13] Rekindles should be less than 1% of annual occurrences, but the average for 2006-2018 was 8%, and reached 15% in 2011. Fires that spread across more than 1,000 ha should have been eliminated. However, in the 2006-2018 period fourteen fires covered more than that. The only year in which no fires covering more than 1,000 ha were recorded was in 2018.

implemented, resulting in the increased vulnerability of the system to extreme weather events (Beighley and Hyde, 2009; Collins *et al.*, 2013; IESE, 2015; AR, 2015; OTI, 2019). Moreover, the SDFCI found it difficult to maintain results in light of the ageing population in rural communities, landscape changes and climate variability, and was unable to implement prevention and adapt to high impact low probability phenomena.

2017 LESSONS LEARNT

The severe fires of 2017 led to the creation of two Independent Technical Committees (ITC) at the Assembly of the Republic, bringing together experts appointed by the various parliament groups and others appointed by the Council of Rectors of Portuguese Universities (CRUP). These ITC published two reports, one commonly associated with the Pedrogão Grande fires, although it also focused on other areas, and another related to the rural fires of October of the same year.

The reports identified several weaknesses, some specific to a particular area and others that cut across the different components of the SDFCI in the following areas:

- *Structural prevention*: lack of fuel management, no use of landscape-scale mosaics, minimal active forest management.
- *Surveillance, detection and inspection*: unable to adapt resources to projected operational needs, lack of monitoring of the implementation of the plans, absence of operational meteorology applied to rural fires.
- *Suppression, mop-up and post-fire surveillance*: populations unaware of the practices to follow in case of a rural fire, the areas of intervention of the various agents is unknown, misperception of the potential severity of fires.
- *Qualification*: significant difference in the qualifications and professionalism of the different institutes involved in the system, deterioration of the voluntary scheme in terms of number of agents and the training thereof, limited number of personnel from professional intervention forces.

- *Knowledge*: lack of incorporation of current scientific and technical knowledge in operational decisions.
- *Governance*: weak leadership of the national forest authority, lack or absence of coordination between those responsible for prevention and suppression operational personnel, lack of understanding of land use by suppression agents, absence of a specialised command that combines the actions of the various entities in an emergency situation.

As a result, when the SDFCI was tested under very demanding conditions it proved incapable of providing the required response, mostly due to inadequate harmonisation of priorities and the levels of intervention of the different entities, as described in detail in the Independent Technical Commission's report. Cross-cutting double weaknesses were also identified in the SDFCI: not only are there shortcomings in the three pillars of action, there are also shortcomings in the smooth operation between them, that is, in the coordination and cooperation at national, regional and local level. The way in which forces are organised and the SDFCI is structured has proved to be a source of difficulties. Because it is divided into three tiers, there tend to be inadequacies in the production of information and breakdowns in communication between the various actors, inconsistent with a functional system with the systematised gathering and smooth flow of information, capable of addressing the problem.

UNDERSTANDING ROOT-CAUSES OF THE PROBLEM

The SDFCI cannot, however, be dissociated from the Portuguese natural and socio-economic context that has shaped its development as a formal fire risk management system. Does the landscape and human occupation impede the success of the SDFCI? The introduction of the mechanical-chemical agrarian model in the 1940s, which made smallholder family-operated farmlands less competitive, and the subsequent migration saw thousands of hectares used for cultivation or grazing transition to forest occupation (scrublands and wooded areas). This change in occupation, strengthened by the public and private mechanisms to promote artificial

afforestation is known as the 'forest transition process'[14] and is closely linked to the fire problem in Portugal (Mather e Pereira, 2006), described in detail by Oliveira *et al.* (2017).

To the south of the Tagus river, the large landholding found economic viability in implementing forestry and silvopasture in vast areas previously occupied by dry cereal crops, by cultivating eucalyptus stands and with extensive pastoral activity in the agro-system of the cork oak and holm oak groves. On the northern coast of the Tagus river, populated by small-scale properties, with poor soil and on steep slopes that supported subsistence farming, the classic forest management models did not have the scale to allow implementation of good forestry or silvopasture practices which would help reduce the threat and create sustainable value. However, the urban and industrial fabric expanded across forest land along northern Portugal's Atlantic coast as a result of the rural exodus, creating an extensive and jagged urban-rural interface. In turn, in the countryside north of the Tagus river, villages and sparsely populated areas became surrounded by former farmlands overrun by wild vegetation and once managed forest areas (woodlands and scrublands) that were now abandoned.

This forest transition was very quick as a result of a negative demographic change over a period of 50 years. The rural population that in the 1960s accounted for 60% of the total population, fell to the 5% of today. Not only have many of the lands once dedicated to agriculture been abandoned, village and localities have seen their population dwindle, with the remaining inhabitants no longer depending financially on the land to create value, except for some agricultural activity to supplement an industrial job or local services, since their well-being was now supported mostly by their income as part of the smaller working population, but essentially by pensions and remittances sent by their migrant relatives.

After the 1970s, an increase in production factors and a drop in the amount paid to landowners for wood products discouraged management of pine forests and other indigenous species on

[14] A theory that explains the growing occupation of wooded areas due to technological and demographic changes, substantiated when the net balance between the areas that transitioned to forest occupation and those that were lost to other uses is positive. Whether natural or artificial, in this transition there may still be a change in the management goals of these areas, thereby changing the paradigm of these pre-industrial, industrial and post-industrial models.

smallholdings, while public policies promoted afforestation with new pine and eucalyptus stands. Given the inability to introduce a forest management model that would aggregate the properties for a thought-out intervention at a landscape level, separating ownership from management, it developed haphazardly under a rental dynamic by the thousands of landowners, transforming a landscape once made up of many mosaics of farming and grazing land in a monotonous landscape into a *continuum* of industrial forest (essentially for milling) and scrublands with high fuel loads.

Since the 1990s, globalisation, urbanisation and common agricultural policy prompted the abandonment of traditional agriculture. Between the two most recent agricultural censuses, it is estimated that 1 million hectares of useful arable land stopped being used, left fallow, undergrazed or abandoned, thus contributing to the continuum of combustible materials. In the past two decades there has been an increase in the proportion of burned agricultural or once agricultural area, significantly affecting rural populations, their property, crops and animals, thus contributing to the concept of 'rural fire', as opposed to 'forest fire'. Strictly speaking, these much larger areas, occupied by woodlands, scrublands, pastures and non-irrigated farmland or areas with several non-urban uses, which require intervention, correspond to over 8 million ha. In the past 15 years, the landscape was affected by more than 291,000 ignitions, resulting in 1.9 million ha of burned area, which is very close to the 2.5 million ha most susceptible to fire in the continental territory, which contain more than 70% of the area burned over the years (Verde e Zêzere, 2010).

CHALLENGES AHEAD

With the already mentioned demographic variation and the aforementioned timeline, one can see that in sparsely inhabited areas a small number of ignitions led to large fires which explains the more than two thirds of burned area, whereas the inhabited coastal districts, such as Viana do Castelo, Braga, Porto and Aveiro, where 70% of fires are concentrated, make a much smaller contribution to the burned area given that the landscape is formed by different patches

surrounded by urban areas (consolidated or not) or farmlands. This is compounded by social pressure regarding response mechanisms, which is greater in more inhabited regions.

According to the PNPOT[15], double ageing (lower birth rate and increased life expectancy) will contribute to population decline (above 1%) and the inversion of the age pyramid across the country. This will have more of an impact in the interior of the country as internal migration is expected to continue to the two metropolitan areas and the major cities. Given the close correlation between the number of occurrences and population density (Pereira et al. 2006, Catry *et al.*, 2010), an increase in occurrences on the outskirts of metropolitan areas and a reduction in inland rural areas is expected.

This results in fires that every year threaten life, peri-urban heritage, infrastructures, farmlands, forests and conservation areas, hinder forestry investment in the interior and cause damage to the environment and its ecosystems, feeding the vicious cycle of abandonment. If prevention is not operationalised (clearing vegetation and reducing ignitions), which breaks this cycle and helps reduce the number of fires and vegetation build-up, as described by Collins *et al.* (2013), Portugal would be caught in a 'suppression trap' where suppression forces with increasingly greater advances are, despite everything, unable to stop the spread of fire in extreme weather conditions and would otherwise become a victim to it, creating opportunities for vegetation build-up that will later burn on days when the weather only makes suppression efforts all the more difficult.

In fact, vegetation build-up and severe weather, as far as making fires more difficult to control, increase the chances of personal and property damage, which has been on the rise (2010, 2013 and 2016)[16]. The SDFCI is very vulnerable to weather, with more than two thirds of the inter-annual variability of the burned area explained by weather variables. This will also happen with other similar mechanisms, such as in Spain, but with less dispersion in the average number of fire outbreaks per wooded area, which is five times less than the national average in Portugal.

[15] Law No. 99/2019, of 5 September 2019.

[16] According to the most recent final report on burned areas published by ICNF, in 2016, estimated environmental and material losses amounted to €241 million, €286 million and €368 million in 2010, 2013 and 2016, respectively.

According to the PNPOT, the pressure on ecosystems, populations and the economy as a result of climate change is a very relevant variable given that all projections until 2040 estimate that the maximum temperature in the summer will rise between 0.5ºC along the coast and 2ºC in the interior, and may even reach 3ºC and 7ºC with an increase in frequency and intensity of heat waves. With regard to rainfall, which affects annual vegetation growth and the propensity thereof to burn, the scenarios for 2100 estimate a 20% to 40% reduction in precipitation during spring, summer and autumn. The combined effects of heat and drought will result in more days of the year being prone to fire and increased dead fuels and, in particular, live fuels, which will mean a considerable increase in extreme fire danger days (Durão e Corte-Real, 2006; Trigo *et al.*, 2013).

It would thus seem that in 2030 Portugal will be more vulnerable, emphasising the duality between the north coast, south and interior and the Tagus river valley, and with the central mountain massif further marking the divide between the country's homogeneously warmer south and the more moderate temperatures in the north. The south, therefore, is expected to continue to have its fire regime dependent on vegetation build-up (fuel limited, in the words of Pausas and Munõz, 2012), so it is very important to maintain the agroforestry system and scaled management of the wooded areas in the Alentejo region and the Algarve, while the north and central coast will be more exposed to weather variables (more and hotter days). This move northward, to territories with more woody vegetation and steeper slopes, will make extreme events such as those of 2017 more likely and frequent, thereby significantly increasing exposure of forest and natural assets to the risk and exposing peri-urban populations in the central coastal region and north of the country to the effects of very intense and fast-spreading fires.

Large fires will therefore be increasingly more likely, particularly in areas without aggregate management of trees and shrubs, which, should land continue to be used in the same way, will occur north of the Tagus river, in a landscape where there is a significant lack of planning and active management and where communities with behaviours that are inappropriate to the circumstances use fire carelessly. An inadequate perception of the risk, which places too much expectation on protection under a suppression system that, despite operational improvements, will also have its limitations, requires the simultaneous implementation of multiple holistic and participatory solutions that are put into practice in an integrated and cross-cutting manner

together with the initiatives of the action plans and adjusted to the regional realities and dynamics. For instance, taking the aforementioned weaknesses into account, frequently and repeatedly investing in reducing the fuel load along the north coast around vulnerable or critical infrastructures and buildings and their surrounding forests and scrublands will be a priority, alongside aggregate management of land use and occupation, which implies paying particular attention to the socio-economic incentives for landowners and the empowerment of their associations or cooperatives and regulation of the markets that exploit forest resources.

In the south of the country, longer and more severe droughts may also result in fast-spreading fires. It is, therefore, crucial to maintain the pastured agroforestry mosaic, intervene in wooded areas with greater fuel load, ensure a reduction in incidental occurrences associated with the use of machinery or energy transport, and anticipate the need to equip suppression crews with airtankers and skidder-type machinery in anticipation of a possible water shortage in dams.

Organisation of the landscape and property and the responsibility that places on landowners and local authorities is not insignificant. And, given the social and economic causes, which explain widespread vegetation build-up and makes economic life and activity that much more vulnerable, and despite the existing fire detection and suppression systems, it is very important to be able to design public policies and incentives that can be applied regionally to mobilise private landowners, who own most of the land, preferably through associations, such that they become an active part of building more adaptive and resilient landscapes.

SOCIO-ECONOMIC DYNAMICS

According to the diagnostic report approved by Resolution of the Council of Ministers No. 13/2019, of 21 January 2019, emphasising the size, contribution and importance of the forestry sector and the forest industries to the national economic accounts (2.5% of the GDP and 9% of exports), forest areas (wooded areas and scrublands) occupy more than two thirds of the territory and contribute to the generation of other non-wood goods and services, particularly ecosystem services. However, there are constraints and challenges, in particular loss of profitability for landowners

(increased operating management costs and drop in the sales price) who choose not to intervene and abandon their assets to the increasing fire risk. Market failures in wood products, which have worsened given the asymmetry of negotiating power between atomised production and concentrated demand, are compounded by the absence of mechanisms (policies and incentives) which still do not allow landowners to harness the environmental services generated. For many landowners, the damage and loss of potential value is, thus, a rational decision that leads to abandonment. The private property structure is extremely fragmented, especially to the north of the Tagus (rural properties cover an average of 0.57 ha in 14 of the 18 districts), which, due to the administrative costs, unit operating costs and context associated with individual management of small plots, makes the already fragile economic return on the more profitable forest species (eucalyptus, pine and cork oak) even weaker, and especially on the slow-growing indigenous species. Added to this dysfunctionality of management is the fact that there are a lot of landowners, in particular heirs, who are unaware of the location, boundaries and ownership of the lands, which, in most cases, are thus left unmanaged.

It should also be noted that 24% of Portuguese rural land is used for the productive exploitation of forests, 36% are wild, that is, unmanaged or poorly managed and, as such, exposed to several inter-related risks, in particular fires, pests, diseases and the spread of invasive species.

As regards management, the report states that it is shared between private (84%), common (14%) and public (2%) landowners, which makes Portugal one of countries with the largest percentage of privately owned forest land in the world. Compared to the rest of Europe (EU-28), where 40% of the forest is publicly owned (ranging between 86% in Bulgaria and 19% in Austria), it becomes clear how unique the forest ownership regime in Portugal is.

In light of the above, one might say that forest maintenance, in Portugal, very much depends on the intensity and frequency with which scrublands are managed. The expansion of forest cover will continue for as long as informal and local solutions are successful, which are closely linked to economic activity that creates benefits for those who are closest and to practices that ensure forest protection.

RISK GOVERNANCE EVOLUTION

The separation of forest use in the national context saw institutions and operators in Portugal significantly delay the adoption of structures with technical and operational personnel (knowledge body) to govern and manage the risk effectively (Oliveira, 2017 and Pacheco *et al.*, 2015). For example, the delay in the forestry association movement (1990s), the insistence on attributing the problem of fires or their size to arsonists or lack of detection, and the trouble the government has in regulating the exploitation of forest resources, which does not have a tree felling law because there are no records on a significant portion of the territory. Activate policies for encouraging joint management by rural landowners must therefore be deepened or the rules of inheritance and succession law changed. With regard to active policies, the integration of public energy, industry, environmental, agricultural, forestry, nature conservation, spatial planning, regional development, employment, education, economic, legal and fiscal policies is key.

Law-making is common following major fire seasons. However, either due to failing to implement intentions or programmes or the lack of continuity thereof, there has been no scaled and aggregate management of the areas that burned in the past two decades, as a result of socio-economic dynamics and low return on forest investments. As there is now a need to review legislative acts concerning fires, as a result of the transformation determined by Resolution of the Council of Ministers No. 157-A/2017, of 27 October 2017, and to design simpler processes that are less time consuming and require less government resources, legislation on the regulation of forest use and nature conservation also needs to be improved and requires serious political attention, as identified in the legislative acts mentioned above, given that much of the problem stems from the rights and obligations of the thousands of landowners and heirs who hold an overwhelming majority of the land. As such, if the path that leads to the Portuguese people becoming less exposed to the danger of severe events is to create mosaics and areas that extend far beyond a single property, then mechanisms that foster different forms of aggregate management must be created, thereby enabling control of land occupation and use and, in particular, a change in fuel load.

The dispersion of ownership, the need to align policies – such as spatial planning of forest and grazing lands – and the usefulness of improving some legal provisions is an excellent opportunity to mitigate one of the problems in national territory: inefficient protection of buildings and the best way to manage the surrounding flammable vegetation. In the absence of established practices of fire-resistant construction in rural spaces or the promotion of building consolidation to increase collective protection, the legal provisions concerning fuel management bands around the properties, which are excessive or inadequate, do not suffice. As such, a more defined and varied technical regulation of the territory, taking the landscape features into account, is needed. Such a regulation will allow economic and social aspects associated with fuel management of the interfaces to be considered, providing for the possibility of promoting productive interventions in rural spaces. Furthermore, it is important to ensure that the insurance associated with the buildings covers external risks and that it favours practices to reduce the exposure of property to the respective hazards.

Having identified the landscape and dispersion of property and noted the important role citizens play in resolving the problem, we would be remiss not to mention the weaknesses in governance that also influence the success of the SDFCI and any other system that comes after it. Fire response crews were arranged into three levels of hierarchy (national, district and municipal). However, this was not reflected in other areas, such as planning and prevention. The responsibilities are scattered among the central government, municipalities and non-government organisations that established themselves as relevant stakeholders, thus requiring major horizontal and vertical cooperation in all areas of intervention beyond fire suppression. Of particular note are the recent reports that analyse the problem, in particular the reports published by the ITC (2019; 2020) and Audit Court (2019).

Despite the significant involvement of the Regional Development and Coordination Committees in the 1990s with regards to planning – including that of forest land – , there was insufficient capacity to continuously implement a process that would ensure the link between the national outlook and operational planning at intermediate level and the subsequent and organised operationalisation of prevention at municipal or local level envisaged in the Regional Forest Planning Programme (PROF). It, therefore, is hardly surprising that once the Basic Law on Forest

Policy (Law No. 33/96, of 17 August 1996) was approved in 1996, the provisions of Article 10(2)(d) were not implemented '*establish a national, regional and sub-regional structure to plan and coordinate fire prevention and detection initiatives and for collaboration in fire suppression operations*'. The policy withdrawal of the district level and the emergence of the NUTS II and III at the end of the 20th century as a planning unit, and the more recent creation of Intermunicipal Committees, suggest a harmonisation of the structuring of political, institutional and operational governance at this level, making a multi-municipal system key to ensuring consistency in planning and evaluation.

Finally, with ownership of the landscape fragmented and governance requiring increased coordination, the perception of risk also needs to be improved given that the national context requires very precise communication targeting heterogeneous audiences of all ages, based on the best forecasting, prediction and decision support practices. Geographic information systems and facilities for characterising land occupation and susceptibility to fires are of limited use. The use of fire behaviour modelling technology, which could help predict the expected spread of a fire and to act in a timely manner, has been minimal, hindering targeted and timely communication. Given the complexity of the problem and the multiplicity of actors and different views on the problem, significant investment is needed in risk communication for a consistent and technically feasible management policy.

This is, therefore, the national context that requires change. A context of uncertainty in the face of climate variability and inter-annual weather variability, orography and land occupation and use, and the expected social and economic resistance to the transformation. Since the problem lies at landscape level social initiatives must be urgently implemented, ones that increase the value of rural areas and mobilise the respective owners (public, community and private) to carry out aggregate management of their property, by establishing an association or co-operative which is a very important part of the solution (land occupation and use at landscape level). To ensure scaled management, it is necessary to implement vegetation management practices that reduce the threat, encourage changes in behaviour and prepare citizens and communities for the possibility of extreme events, by creating more effective forces to help prevent such events or to manage them when they are unavoidable.

Because changes need to be made in order to address the problems identified, this Plan explains, *ex ante*, the goals and targets set for the 2020-2030 period and identifies and establishes the procedural changes that need to be made during implementation thereof, including in the planning, prevention, pre-suppression, suppression and post-fire processes, and the cross-cutting activities such as governance, qualification and information and communication systems. To reach a stage where knowledge and the use of fire can be capitalised in prevention rather than only in the suppression of fires, the root cause of the structural weaknesses identified must be addressed and the leverage points identified to change the system and behaviours and to transform the landscape in the desired direction.

INTEGRATED WITH NEW PUBLIC POLICIES

To this end, the Plan's strategy is rooted in other public policies, thereby finding coherence and consistency. First in the **PNPOT**, a very important instrument of the Territorial Management System and which emphasises the concern with the territory and its vulnerability to fires in its various technical components, including diagnosis and scenarios and, particularly, the strategic thinking that shapes it. By prioritising the importance of the value of natural assets for nature conservation, the economy of the forestry and agroforestry sectors as anchors for the development of rural land, and by encouraging the improvement of territorial governance, emphasising its criticality as a tool for preventing and mitigating the increased risk of climate change, the PNPOT is an excellent framework for designing the strategic guidelines of this Plan.

However, another preceding framework was also considered in this regard, the **Portuguese Forest Policy Law** (Law No. 33/96, of 17 August 1996), which contains a set of guidelines, two of which have already been implemented in the transformation process that started after 2017 and which will contribute significantly to solving the problem of fires, in particular the approval of the Regional Forest Planing Instruments (PROF) and organic law of ICNF, I.P. in 2019, which establishes the institution as a national, regional and sub-regional organisation tasked with planning and

coordinating fire prevention and detection initiatives and collaboration in rural fire suppression operations.

Another related policy instrument is the **National Forest Strategy** (Resolution of the Council of Ministers No. 6-B/2015, of 4 February 2015) which, in 2015, recommended 'that irrespective of the ongoing interim evaluations, the core measures of the PNDFCI (2006-2018) must continue to be implemented, particularly the full operation of the organic structures created for the harmonious implementation thereof'. **The reports published by ITC1 and ITC2 recommend** systemic changes, including at strategic level (specialisation of the RFM and RFP pillars), in risk governance and risk management processes, and establishing priorities, particularly those that effectively and harmoniously ensure the link between and coordination of policies and initiatives. At the end of 2019, an audit report published by the Audit Court (2019) highlighted the lack of coherence between the national and municipal levels of the DFCI planning structure, thus strengthening the case for improving the fire risk governance structure.

In addition, the **National Nature Conservation and Biodiversity Strategy** (Resolution of the Council of Ministers No. 55/2018, of 7 May 2018) recognises the value of natural heritage, promotes the improvement of the conservation status and encourages society to appropriate natural values and biodiversity.

With regard to national, European and international emission commitments, of note is the **Roadmap for Carbon Neutrality 2050** (RNC 2050), published in July 2019, which is the long-term strategy submitted to the United Nations Framework Convention on Climate Change, stating that '*the goal is to reduce Portugal's GHG emissions between 85% and 90% by 2050, compared to 2005, and offsetting remaining emissions with agriculture and forestry, through a trajectory that reduces emissions between 45% and 55% by 2030 and between 65% and 75% by 2040*'.

In this regard, the Portuguese strategy is based on reducing emissions and increasing forest sequestration, where a critical success factor is a 60% reduction of burned area (from an average of 164,000 ha between 1998 and 2017 to 70,000 ha per year in 2050), thereby ensuring that burned areas do not become scrublands, that the average yield increases with better management, the afforestation of 8,000 ha of non-forest areas and that small ruminants are used to reduce fuel

loads. In view of the fact that peak emissions are linked to years with a larger burned area, 2017 explains the marked rise in emissions (more than 10 Mt of Co2e), making it crucial to design strategies that reduce the likelihood of the events of 2003, 2005 and 2017 repeating themselves. The monitoring of emissions, resulting from changes in land and forest use for the 2021-2025-2030 period, is enhanced by the pledge made by Portugal (Regulation (EU) No. 2018/841 of the European Parliament and of the Council of 30 May 2018).

Finally, it is important to note that the **National Strategy for Preventive Civil Protection** (Resolution of the Council of Ministers No. 160/2017, of 30 November 2017) sets five strategic goals aligned with the priorities of the **Sendai Framework**, namely a) strengthen risk management governance, b) improve knowledge of risks, c) design strategies to reduce risk, d) improve preparedness to face risks, and e) engage citizens in understanding the risks.

THE PROCESS

Essentially, the NPIRFM development process began, as already mentioned, with sharing the problem and challenges to be overcome in working sessions involving the heads of the central government and listening to the stakeholders. Subsequently, the weaknesses, strengths, opportunities and threats (commonly known as SWOT) were reflected upon and the main challenges and critical success factors identified and systematised, comparing them with international benchmarks and the challenges and recommendations set out in specialised policy briefs (Rego *et al.*, 2018 and UFRO, 2019). This technical exercise was later compared with the policy and spatial planning instruments in force.

Despite the consistency of these diagnoses and proposals the situation has worsened, making the operational programmes, which are all the more urgent to overcome the barriers identified, even more complex and demanding. Recognising the systemic nature of the problem, the NPIRFM adopts a holistic and multi-level approach to contribute to the much-needed paradigm shift.

04 THE STRATEGY

4.1. THE INTEGRATED RURAL FIRE MANAGEMENT SYSTEM

Since Portugal is a signatory to the UN Sendai Framework for Disaster Risk Reduction (UNDRR) 2015-2030 and member of the FAO, which endorses the principles and guidelines for fire management, an integrated fire management system has been adopted as part of the strategy. In essence, these systems take into account sectoral policies that are in line with and based on operational planning and management, including the importance of social, economic, cultural and ecological value aimed at minimising damage and maximising the benefit of fire. These systems combine fire prevention and suppression strategies, which include techniques that regulate the proper use of fire (FAO, 2006; Rego *et al.*, 2010). These integrated planning and operation systems must be supported by dynamic risk assessment (hazard, value and vulnerability and exposure, taking into account social and weather scenarios) and be focused on efficiency and effectiveness, with programmes dedicated to reviewing legislation, empowering institutions, governance, planning, knowledge management, educating the community, vegetation management, creating a warning and alert system, preparedness and risk mitigation, restoring the capacity of communities and the environment, and monitoring (FAO, 2006).

Considering fires as a complex socio-economic problem, with multiple public and private actors that are affected differently, political and operational decisions should be supported by risk assessment, evolving from the current paradigm of simple statistical analysis to a probabilistic risk analysis, discussing cost-benefit alternatives and deliberation (Renn *et al.*, 2011). This progression towards an integrated system, both in terms of governance and operational management, will be decisive for implementing this vision, since minimising potential damage as a result of extreme events is the strategy's ultimate goal. Empowering institutions is critical for the IRFMS to achieve

this goal and will require the use of scientific knowledge through agents capable of operating processes with a clear assignment of responsibilities.

Protect Portugal from severe rural fires – the vision outlined in the strategy – is in line with the mission to *protect people and property from rural fires and develop wild land, ensuring ecosystems are properly tended to.*

To fulfil this mission, that has two distinct, complementary and interdependent purposes and requires different approaches and techniques, the previous system must change.

As such, the IRFMS is based on two pillars of action that the Independent Technical Committees consider key to reducing the impact of rural fires. These two pillars, Rural Fire Management (RFM) and Rural Fire Protection (RFP), are a significant difference in relation to the previous plan[17], in force between 2006 and 2018.

They require specialisation and the resulting qualifications in order to be able to more effectively manage land and what are becoming increasingly more complex events. Furthermore, they will help support the path to professionalisation and thus ensure a more stable resource availability, less dependent on the increasingly unpredictable critical periods. This system addresses the weaknesses referred to in the previous chapter and the concept of dual involvement – balancing prevention and suppression, as stated in Resolution of the Council of Ministers No. 157-A/2017, of 27 October 2017, embodied in the Single Directive on Fire Prevention and Suppression, Resolution of the Council of Ministers No. 20/2018, of 1 March 2018, and continued under Resolution of the Council of Ministers No. 12/2019, of 21 January 2019.

[17] PNDFCI – National Forest Fire Protection Plan.

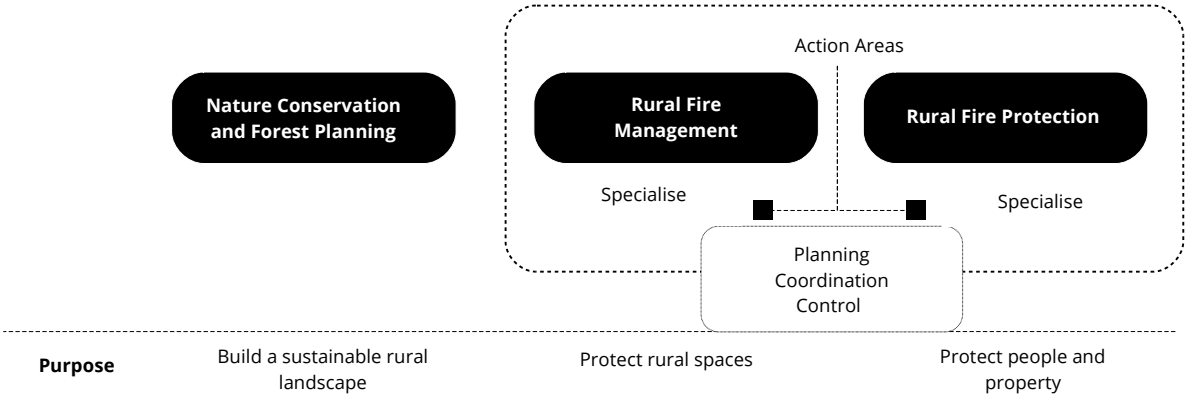


Figure 1. Macro design of the new competence and specialisation model

The political responsibility to protect rural spaces through proper fire management falls to the member of the government responsible for the environment, while the protection of people and property is ensured by the member of government responsible for home affairs. This division, technically anchored in the classification of rural and urban land[18], clarifies the responsibilities of the two main public institutions (ICNF, I.P. and ANEPC) in the prevention and mitigation of fire risk, respectively, in rural spaces (Rural Fire Management) and the surrounding buildings and industrial areas (Rural Fire Protection). The success of the new system depends on the smooth integration of these responsibilities.

These two institutions will be provided cross-cutting support from local authorities, fire brigades, the GNR and Armed Forces as well as other civil society organisations, such as farm and forest producer organisations, in all procedural stages, from planning to restoration, including prevention, surveillance and suppression.

[18] The classification and reclassification of land is established in an inter-municipal or municipal territorial plan, pursuant to Regulatory Decree No. 15/2015.

The strategic coordination and monitoring of the IRFMS falls to AGIF, I.P., created by Decree-Law No. 12/2018, of 16 February 2018.

According to its statutory duties and policy guidelines, AGIF, I.P. facilitates the coordination, at supraministerial level, of the public policies, programmes and initiatives to be carried out under the IRFMS, including the involvement, participation and cooperation of the various public and private entities that are part of the system and in which managers, landowners (forest and farm land) and local authorities will play a decisive role. Once the processes in which they intervene have been defined, these institutions ensure the effective and efficient reduction of the risk (fuel management in wooded areas and scrublands) in rural territory, the surrounding areas and buildings, helping to minimise risk behaviours in the population.

The first innovative change introduced is the development of a supraministerial platform to coordinate the system, with which AGIF, I.P. was tasked, for planning, strategic coordination and evaluation linked to the ICNF, I.P. and ANEPC's pillars of action, which will, to the extent applicable, carry out fire management and fire protection.

Similarly, the financial dimension of the IRFMS fits in with strategic coordination, with AGIF, I.P. responsible for producing consolidated information on the overall budget for the system, based on the budgets of each entity and the respective sources of funding.

The organic structures of ICNF, I.P. and ANEPC were reviewed so as to balance and complement each other given that the system’s level of sub-national intervention takes place at regional and multi-municipal level, eliminating the district level in place to date. It is also essential to review the legislative acts concerning Municipal Civil Protection Services and the Technical Forest Offices.

It should be noted that, generally speaking, the functioning of the State and other public authorities has gradually abandoned the district approach. The design of the system aims at progressively accommodating this new arrangement in the institutional relations with the other entities.

The existence of new chains of command, as a result of the introduction of regional and multi-municipal levels, must also be considered in the sectoral legislation establishing rules of operation.

Fire Bridges, the Special Civil Protection Unit, the GNR, Forester-Firefighters and the Armed Forces are the main agents in fire suppression across the entire rural territory, and in the preparation and pre-suppression stages, intervening in accordance with their qualifications and skills and following ANEPC's principle of unity of command, as laid down in the Basic Law on Civil Protection, the Integrated System for Protection and Relief Operations (SIOPS) and in the Operations Management System. This principle is in line with the joint operational command approach, respecting the hierarchies of each of the forces whose skills and mission are pre-established and managed by the commander of relief operations. It is estimated that a total of 11,000[19] accredited or to be accredited operational personnel will be part of the force during the critical period.

ICNF, I.P. coordinates prevention efforts on rural land and ANEPC coordinates prevention in the urban and surrounding areas (population clusters, industrial areas and other infrastructures used by people and typified in specific legislation). These entities contribute to designing prevention and suppression measures for each land type. ANEPC is tasked with commanding suppression operations.

Because of its experience and transversality, the GNR is entrusted with coordinating inspection, surveillance and detention, and also supports prevention and suppression operations, according to the strategic guidelines of the IRFMS and the technical needs identified by INCP, I.P. and ANEPC.

It should also be noted that implementing the system necessarily requires the commitment of local authorities, particularly in prevention activities, encouraging the self-protection of towns and villages and people, and reinforcing the responsibility of each citizen and landowner.

It was already with this new system in mind that during 2018 a programme was launched to transform the SDFCI, paving the way towards the IRFMS, that included 11 ministries and

[19] Includes more than 6,000 elements that are not firefighters: 2,000 forester-firefighters from forest producer organisations and municipalities, 475 employees from ICNF (CNAF and CNVN), 260 forester-firefighters from Afocelca and 3,380 elements of the GNR (Forest Rangers, SEPNA, spotters from the lookout tower network and 1,185 GIPS).

underpinned by 4 fundamental pillars of action: reform the existing system, ensure the safety of the people, increase the resilience of the territory, and qualify and empower the system.

Most of the initiatives under this transformation strategy were carried over to 2019, which define structural, political and legal changes, such as the transfer of command and management of aerial support resources to the Air Force, the new organic laws of ANEPC and ICNF, I.P., reinforcement of the GIPS and the subsequent UEPS, creation of AGIF, I.P., and implementation of the NPIRFM, those which make a decisive contribution to consolidating the gradual change of the system.

This transformation accounted for total expenditure in the IRFMS with a more significant weight on the prevention pillar, justified by increased fuel management, spatial planning and surveillance initiatives, prioritising major risk areas, building operational teams and their resources and equipment. There was also a significant increase in investment in awareness-raising campaigns and protecting people with the implementation of integrated risk communication programmes.

Investment in the suppression pillar also increased compared to 2016, channelled mainly towards building up the force by increasing the number of personnel and resources across the four levels of engagement, increasing the number of on-call aircraft and improving interoperable decision support systems.

High-level responsibilities, which condense the responsibilities of each of the system entities, are presented in the table below (table 1) and described in more detail in a separate document. In line with the detailed procedures, the respective responsibilities are separated into each of the stages in the system's process chain, from planning to post-fire, as described below.

Table 1. Summary of the responsibilities of the IRFMS entities

	PLANNING	PREPARATION	PREVENTION	PRE-SUPPRESSION	SUPPRESSION AND RELIEF	POST-FIRE
AGIF, I. P.	• Coordinates the preparation of the National Plan for Integrated Rural Fire Management, implementation and respective reviews, and the consolidation of regional-level instruments • Participates in the integration of public policies	• Coordinates and implements the global communication strategy with the system entities • Implements awareness-raising campaigns	• Encourages joint prevention activities • Ensures information is up-to-date in the information and communication system	• Helps interpret weather forecasts and risk assessment to inform decisions on issuing warnings and alerts • Defines the rules for identifying fire risk and hazards • Pre-positions experts	• Makes experts available for the decision-making, command and control process • Gathers and provides information for efficiency assessment	• Coordinates the lessons learned process • Compiles and analyses information on damage and operating costs
ICNF, I. P.	• Plans the new landscape model • Designs operational guidelines and the RFM budget according to the national strategy	• Heads the national programme to reduce ignitions • Implements awareness-raising campaigns • Ensures operational management 365 days a year and the logistics of operational RFM structures	• Ensures implementation of a landscape fuel management programme • Ensures the creation of the primary system and promotes other rural fuel management and development activities	• Supports risk assessment and decisions on issuing fire danger warnings • Helps define the rules for identifying fire risk and hazards • Pre-positions resources • Participates in decisions to raise the state of alert and pre-positioning	• Provides support by committing specialised RFM resources, including machinery • Provides support in command and control together with ANEPC	• Identifies, records and reports damage assessed under RFM • Defines stabilisation and restoration interventions • Implements stabilisation and restoration interventions on the land it manages
ANEPC	• Designs operational guidelines and the RFP budget according to the national strategy	• Heads the Safe Village and Safe People programmes • Helps local authorities to identify shelters and conditions for evacuation • Implements awareness-raising campaigns	• Promotes the creation of the secondary system and other fuel management interventions in the interface's built-up area	• Forms the risk assessment unit to support operational decisions and decisions on issuing warnings and alerts • Ensures populations are warned • Determines the raise in the state of alert and pre-positioning	• Develops and coordinates command and control in the SIOPS, according to the Operations Management System (SGO), based on capacity and independently of the entity • Tactically coordinates aerial support resources	• Identifies, records and reports damage assessed under RFP on the interoperable platform
GNR	• Draws up operational guidelines, determines the size of its force and budget	• Coordinates inspection to confirm compliance with legal provisions concerning fuel management and the use of fire • Implements awareness-raising campaigns • Implements controlled fire initiatives together with ICNF, I.P • Keeps a standing force of the UEPS at the ready for initial attack and fire suppression in the rural and peri-urban spaces	• Coordinates inspection to confirm compliance with legal provisions concerning fuel management and the use of fire	• Coordinates inspection, surveillance and detection and conducts initial ground and/or aerial attacks • Coordinates the National Lookout Tower Network (RNPV)	• Uses suppression resources • Conducts initial ground attacks using helitack crews or brigades, supports extended attacks and sets up roadblocks, limits movement and opens corridors for relief forces • Helps evacuate people who are in danger	• Investigates the cause of a fire together with ICNF, I.P.

	PLANNING	PREPARATION	PREVENTION	PRE-SUPPRESSION	SUPPRESSION AND RELIEF	POST-FIRE
FFAA	• Draws up operational guidelines, determines the size of its force		Implements the clearing of fuel breaks, improving itineraries and maintaining water points	• Ensures a deterrent presence in areas agreed with ICNF, I.P. together and in coordination with the GNR	• Supports mop-up and rekindle surveillance operations • Provides support in logistics operations • FFAA (Air Force): Observes and coordinates aerial support resources committed to the theatre of operations • Provides machinery and engineering equipment for operations	Helps evacuate people
Fire Brigade	• Takes part in the discussions for planning and drafting operational guidelines	• Helps local authorities to identify shelters and conditions for evacuation • Helps in the capacity-building of communities	• Helps local authorities in the safety checks to protection and relief equipment • Checks its own equipment • Helps farmers with waste burning	• Pre-positions response crews	• Carries out suppression activities according to its capacity • Helps in relief operations	• Helps in restoration activities • Helps the GNR by preserving evidence for them to investigate the causes
Local authorities	• Assesses the national operational guidelines at local level with transposition into municipal planning	• Keeps an inventory of protection infrastructures such as places of refuge and shelters, evacuation routes and water points • Prepares the operational response and logistics through the SMPCs • Raises awareness among citizens • Implements the Safe Village and Safe People programmes at local level	• Carries out safety checks to protection and relief equipment • Promotes the creation of fuel breaks and reduces the fuel load according to the law	• Pre-positions response crews • Issue local warnings to the population	• Provides logistics support in operations • Helps in relief operations	• Lists damage • Helps the populations return to pre-fire conditions • Helps re-establish services
IPMA	• Designs strategies for improving the weather information provided and contributes towards professional qualification	• Implements procedures for improving weather and fire danger products for dissemination to the various authorities and action plans for internal and external training • Provides weather information	• Feeds weather and climate information into the information and communication system for assessing weather hazards and the potential risk	• Provides real-time weather and fire danger information and provides decision support to the risk assessment unit	• Supports the risk assessment unit in the analysis and development of weather conditions in the short and very short term (within up to 24 hours) and of fire danger.	• Assesses weather conditions and the performance of fire danger indices in the outbreak, progression and behaviour of fires.

Table 1 (cont.). Summary of the responsibilities of the IRFMS entities

	PLANNING	PREPARATION	PREVENTION	PRE-SUPPRESSION	SUPPRESSION AND RELIEF	POST-FIRE
Managers of infrastructures of public interest	• Design strategy and planning based on national operational guidelines	• Monitor and carry out fuel management around infrastructures				• Assess damage to infrastructures • Help re-establish services • Intervene in the restoration of infrastructures
Forest owners, farm owners and forest producer organisations (including AFOCELCA)	• Take part in discussions of the planning process	• Participate in adopting best practices for self-protection and the reduction of ignitions	• Carry out fuel management, protect buildings and manage fire protection systems in areas they manage	• Pre-emptively position resources based on the risk	• Support suppression and mop-up operations through forester-firefighter crews	• Report damage and take part in land restoration activities
Directorate-General for the Territorial Development	• Designs strategies for improving territorial information as well as methods for coordinating spatial planning with forest fire protection planning instruments • Coordinates the preparation of landscape plans	• Systematises information and produces official and themed mapping products, in particular orthophoto maps, a Digital Terrain Model (DTM), Land Cover Map (COS), Land Use Map (CRUS), Cadastral Map (CC) and a Land Vulnerability Map	• Ensures availability of geographical, land and cadastral information in the system (IRFMS) and monitors the development thereof			
CCDR	• Participates in the planning and identification of sources of funding	• Provides technical support to local authorities				
Directorate-General for Agriculture and Rural Development and the Regional Directorates for Agriculture and Fisheries	• Design agricultural mosaics and aligns support decisions together with ICNF, I.P. based on fire prevention services, a specific scale, morphology of the patch and type of crop	• Participate in rural property resizing projects and improving knowledge thereof • Participate in raising awareness among farmers and pastoralists of best practices in eliminating slash and using prescribed fire	Fuel management, new landscapes and land development practices			Participates in inventory and supporting farmers, landowners and pastoralists, and providing support in emergency and restoration operations

Table 1 (cont.). Summary of the responsibilities of the IRFMS entities

4.2. THE PROCESS CHAIN

A process chain has been defined in the model used for the NPIRFM for the IRFMS, which includes assigning responsibilities under each process, properly preparing the partners such that all operational personnel and decision-makers are better prepared to act and decide, the system's budget patterns, shared by all partners for efficient allocation of public funds, and defining the monitoring and evaluation process, which contributes to the continuous improvement of public policies and programmes.

The process chain comprises six stages and twenty-one processes, which are briefly described below and can be analysed in more detail in Annex II, providing precise knowledge of who is assigned which responsibility in each activity under the IRFMS.

The process chain has six stages, as indicated in figure 3.

Figure 3. Stages in the IRFMS process chain

STAGE 1 - PLANNING

Planning defines the interventions and resources needed to implement the programmes and projects that will help fulfil the IRFMS's mission and implement its vision. In the process chain, planning involves three major processes:

- Strategic guidelines and integrated planning (PL1), to establish national guiding principles that are transposed into regional and local instruments and allow operational guidelines to be prepared;
- Operational guidelines (PL2), which reflect the national strategy adapted to the different levels;
- Budget and funding (PL3), which results in the system's annual budget and attracting different funding, ultimately allocating funds to entities and activities.

STAGE 2 - PREPARATION

Preparation includes the major processes that are linked to planning and implementation aimed at ensuring that citizens and organisations are also prepared to act in accordance with the best safety practices. There are two major processes involved in preparation:

- Education and community capacity building (PR1), to drive changes in behaviour and the implementation of self-protection measures through the active participation of citizens and society at all times when it comes to incorporating good practices into their daily lives. Educating and empowering communities is also essential to ensuring more effective risk communication;
- Risk communication (PR2), to help improve risk perception and consequently encourage the adoption of self-protection measures more suited to the rural fire risk, with the centralised transmission of information and dissemination throughout the entire process chain.

STAGE 3 - PREVENTION

Prevention involves implementing initiatives that reduce exposure and vulnerability to fire, acting on these variables so that the fire does not have destructive effects or so that even the elements at risk reduce or cancel out exposure. Prevention involves four major processes:

- Rural land management (PV1), to implement initiatives that prepare the territory for fires, such as fuel management, protection systems, new landscapes and development practices;
- Protecting buildings (PV2), to create and maintain good practices for protecting buildings and population clusters;
- Checking safety conditions (PV3), to confirm the state of repair and operation of protection and suppression structures and facilities, including shelters and places of refuge and protection systems;
- Inspection (PV4), to confirm compliance with prevention measures and to flag nonconformities with the necessary georeferencing.

STAGE 4 - PRE-SUPPRESSION

Pre-suppression is a state of preparedness, of paying attention to the need for immediate intervention, that precedes suppression to ensure the system is ready and has the best information. Pre-suppression involved three major processes:

- Risk assessment (PS1), to analyse the parameters that determine an increase in response capacity and information to the population;
- Surveillance (PS2), to dispatch surveillance resources and deterrent security forces to critical areas;
- Pre-positioning (PS3), to preventively position suppression and relief crews in critical areas.

STAGE 5 - SUPPRESSION AND RELIEF

Suppression and relief is the stage that involves extinguishing a fire (fire suppression) and relief operations to help those who are affected or will be affected by the spreading of a fire. Suppression and relief involves five major processes:

- Initial Attack (SC1), to dispatch rapid response teams for fire suppression and relief;
- Extended Attack (SC2), to provide reinforcements for suppression and relief operations when fires extend beyond initial attack capacity;
- Mop-up and extinguishment (SC3), to eliminate hot spots to prevent reignition and rekindles, and to declare a fire extinguished when the likelihood of rekindle is low;
- Restoring safety (SC4), to assess safety for the return of displaced populations and re-opening roads;
- Implement emergency civil protection plans (SC5), to support operational personnel and the affected population.

STAGE 6 - POST-FIRE

Post-fire operations include processes the take place after the fire, or even during a fire, but in sectors that are considered safe. To simplify the process chain, and in an iterative interpretation of this procedural model, continuous improvement is considered the final process in the chain, despite continuous improvement itself being a process that is shared by any other stage of the process chain. As such, post-fire involves three major processes:

- Investigating the causes (PE1), to determine the causes of a fire;
- Restoration (PE2), to restore the land and help communities get back to normal;
- Continuous improvement (PE3), to identify weaknesses and introduce corrective measures in the system by implementing a lessons learned process, including using knowledge and research centres.

Each process details the steps and the description of the processes that comprise it, and the assignment of responsibilities. In line with the values of the system, particularly competence and experience, this detailed information is provided in a separate document, which is reviewed periodically.

4.3. ENABLERS

The IRFMS process chain is supported by enablers, which are understood to be the system's cross-cutting activities or initiatives that sustain or promote the success of each process. The enablers of the process chain are considered to be governance, qualification and the information and communication systems.

4.3.1. GOVERNANCE

Given the ambiguity of the values-at-risk and the uncertainty of responses, the multiple entities that are directly or indirectly part of the system have different views on the problem, the risks and, consequently, the most appropriate solutions to address it. The institutional context (actors, rules, conventions, processes and mechanisms) is crucial as it is where risk information is collected, analysed and communicated, and where decisions are taken. It is important to consider the IRFMS's governance dimension since it acts as a bridge between risk managers, stakeholders and decision makers (Renn, 2005).

The risk governance process in Portugal involves the political and institutional coordination of the system at three levels – national, regional and local. These are not immune to the growing incorporation of this matter into the European and global framework, such as the Sendai Framework for Disaster Risk Reduction, the 2030 Agenda and the Sustainable Development Goals, or to the demands of a society that is increasingly more aware of the exposure to risk and less tolerant of vulnerability.

The various legislative acts published since 2017 have clarified the institutional framework of the IRFMS, identifying the agents and their respective responsibilities, such as the institutional model that was approved and implemented by Resolution of the Council of Ministers No. 12/2019, of 21 January 2019, or the Single Directive on Prevention and Suppression, Resolution of the Council of Ministers No. 20/2018, of 1 March 2018, denoting the coordination between multiple agents with

shared capacities and responsibilities in their various rural and peri-urban areas of jurisdiction who ensure the management of rural spaces – prevention – and the application of effective and, insofar as possible, efficient techniques and tactics – suppression – in conjunction with any related or derivative risks.

AGIF, I.P. is responsible for the planning and strategic coordination and evaluation of the IRFMS and, pursuant to Articles 10 and 11 of Decree-Law No. 12/2018, of 16 February 2018, the Coordination Council and the Advisory Board are, respectively, responsible for the liaison and coordination, at national level, of the public IRFMS entities and for consultation, at national level, of the entities involved in the IRFMS. In other words, it is up to these two bodies to ensure fire risk governance according to the principles of cooperation, participation, prudence, transparency and environmental, social and economic sustainability, thereby reducing the exposure and vulnerability of people, natural spaces and property, and who advise on monitoring and the measures resulting from evaluation of the Plan.

At national level, macro-policies and strategic guidelines that reduce the danger (vegetation) and change behaviours (landowners, users and the direct or indirect beneficiaries of rural lands) should be created. Since resources are finite, legislative proposals should accompany a multi-annual budget programme for prevention and suppression efforts. As regards the regional and local levels, institutional consultation of the respective actors should be conducted ensuring a bottom-up technical framework for risk management tasks.

Moreover, transversally, many other agents and public policy sectors gravitate towards the matter of rural fires, as can be seen from the strategic action goals set for the IRFMS: spatial planning and rural development policies, fiscal policies, nature conservation policies, energy strategy, education and communication, justice and security, decentralisation of competences in local authorities, among many other policies. These area individually and collectively called to action to tackle a complex problem.

In this regard, under this plan, governance is seen as a prerequisite for supporting the success of the entire process chain and involves three areas of action:

- Organisational, by adapting the main institutions to the demands and nature of the problem;
- Legislative, since this is the primary instrument of administrative response and, as such, should reflect inter-ministerial cooperation;
- Supranational, given the global aspects of some of the causes of the problem and the international and European experience in trying to mitigate the resulting effects.

Thus, and in more detail, the organisational dimension involves the implementation of the new organisational structures of the bodies responsible, first and foremost, for rural fire management: ANEPC and ICNF, I.P. In 2019, with the approval of the organic laws of these bodies, the design and model for multi-scale coordination of the national territory were aligned with the current new paradigm. With regard to ICNF, I.P., there will be a phased integration of AGIF, I.P.'s operational component by 2021.

This first step enables the implementation of coordination mechanisms with bidirectional and horizontal decision-making and information flows from national to local level. This new approach to collaboration will culminate in the creation of a multi-agency centre that includes the different entities (ANEPC, ICNF, I. P., GNR, FFAA, AF, Portuguese Institute for the Sea and Atmosphere (IPMA, I. P.), AGIF, I. P.) with the aim of bringing competencies in matters of planning and coordination together in the same physical space to ensure strategic and operational alignment and efficient decision-making. This initiative breaks silos in addressing the matter, promoting constant and joint studying and planning.

The legislative dimension should also mirror the integrated governance model that the new paradigm of rural fire management calls for. Given the interconnection between public policies and government departments engaged in the matter, the legislative process must be aligned in order to facilitate the harmonisation of legislative sectoral initiatives. Furthermore, it is important to clarify, eliminate redundancies and make existing rules more flexible, following a model of greater accountability of the different agents involved in the decision-making process and eliminating processes and procedures that involve unnecessary bureaucracy and other burdens.

Lastly, the supranational dimension comprises two types of stimuli. The first ensures that the geopolitical and economic space in which Portugal is inserted moves towards the integration of

policies with an impact on the IRFMS, which implies leading the agenda on the European risk management model, highlighting Portugal's concerns and priorities in terms of investment priorities, work processes, the size of the force and sources of funding. The second incorporates the best international practices, adapted accordingly, into the Portuguese system whether through the transposition of operational guidelines, legal regulations or the capacity-building and qualification of the system's agents.

Governance of the IRFMS is also reflected in an evaluation culture based on a system of ambitious but realistic indicators and targets that underpin the approach to achieving the goals set. The monitoring and evaluation (M&E) dimension of the IRFMS, rooted in the communication of good practices and lessons learned, enhances the continuous improvement process, as described in this plan, in (PE3) and in the chapter dedicated to detailing the roadmap for monitoring and evaluation, which is key to supporting external and international communication in the risk governance process.

The NPIRFM monitoring process, detailed in a dedicated chapter, will help in the annual monitoring of physical and financial performance indicators, which will be compared to the annual IRFMS report to be submitted to the government and the Assembly of the Republic by AGIF, I.P., as provided for in Article 4(m) of Decree-Law No. 12/2018, of 16 February 2018.

4.3.2. QUALIFICATION

The inefficiency resulting from the lack of knowledge, technical training and qualification of the various agencies and entities involved in the system requires a new qualification model for IRFMS human resources. This model builds on the current training and skills recognition system by promoting greater coordination between the entities that intervene in this area, incorporating effective knowledge into the various processes of the IRFMS process chain, aligning them with the principles of specialisation and professionalism.

Systematisation is required to ensure the multiplicity of actors, according to size and specific characteristics, and the complexity of the system itself can adapt to this new model. A model that

simplifies all functions performed while at the same time ensuring the consistency and coherence thereof.

The proposed transformation is achieved through a Qualification Programme (QP) under the IRFMS which encompasses all functions in the system, equipping them with the skills appropriate to the specific characteristics of their mission, ensuring the system has qualified agents in the short, medium and long term. This is why qualification also acts as an enabler, since it cuts across the entire process chain.

Such a transformation requires a multi-agency partnership to carry out the QP, defining the mechanisms for regulation, implementation and, consequently, monitoring and evaluation. This requires a permanent collaborative space, designed for the study, planning and strategic proposal of the system and all stages of the Action Plan and Qualification Programme, support for continued learning on a platform where the IRFMS entities are represented and ensures the Programme is properly implemented.

The roadmap to the new model for qualification of the IRFMS, detailed in a separate document to be published, includes profile mapping, updating the diagnosis of training and qualification needs, implementing the plans through a network of accredited entities, and incorporating international exchange programmes and identifying the medium and long-term need for new human resources for the IRFMS.

4.3.3. INFORMATION AND COMMUNICATION SYSTEMS

To support the regular operation of the process chain, it is necessary to guarantee an overall view of the activities carried out under the IRFMS in such a way that all entities, without exception, have all the information they need to operate in all processes, at all times and in all locations. This intention was put forward in Resolution of the Council of Ministers No. 12/2019, of 21 January 2019. As such, the integration of systems (e.g. GeoMai and SGIF, among other systems) – or the search for and development of solutions – must ensure that:

- All planning documents are uploaded to a platform available to all agents;
- All prevention initiatives (e.g. improvement of paths, improvement of water points, technical management of areas, etc.) are uploaded to a mapping platform that enables consultation and reuse by the local or other geographic analysis systems;
- All pre-suppression and/or suppression structures and infrastructures are uploaded to a mapping platform for consultation and reuse (e.g. location of lookout towers or other surveillance mechanisms, surveillance routes, patrol sites, etc.);
- The state of repair of all infrastructures and facilities that are important to the process chain is listed and accessible to all agents that are part of the IRFMS such that they can make more informed decisions on the need for intervention and protection;
- The meteorological measurements relevant to the ignition and spread of rural fires, obtained from different sources, are mapped, accessible and reusable, with the accuracy and updating required in pre-positioning, warning and alert, and fire suppression operations.
- Fires, when in progress, are represented on a mapping platform that indicates the ignition point (estimated or determined) the area already affected and the projected spread of the fire, based on observations in the field and, ideally, complemented by a fire behaviour simulation to help inform decisions, identify suppression opportunities, protect assets and position resources, all of which accessible to all entities and can be re-used in their systems as necessary;
- All personnel involved in rural fires, irrespective of their rank, are represented on a map which allows the Commanders of Relief Operations and their officers (according to the Operations Management System) and all the representatives of the entities involved to have a *Common Operational Picture*[20] at all times;
- All protection and support infrastructures of special interest to operations identified by the entities are mapped, accessible and reusable;
- Information relating to the investigation of the cause of a fire is recorded and can be consulted by the IRFMS entities according to their clearance level.

[20] A single and identical representation of all relevant information shared by one command post.

05 STRATEGIC GUIDELINES AND TARGETS

05

5.1. STRATEGIC GUIDELINES

Simply put, the fire risk equation includes two variables: one that takes into account the fire danger frequency of the ignitions and fuel build up, which in the event of the uncontrolled spread of a fire threaten the assets that need protecting, and the other, in contrast, considers the forces capable of reducing the exposure and vulnerability of the assets to the estimated threat.

Portugal has a systemic fire risk that cannot be solved by adopting a single, general, linear and sequential solution. It requires a set of coordinated solutions that help solve, or gradually solve, part of the problem and the resulting consequences.

Four strategic guidelines have been established, underpinned by the principles of the IRFMS and its process chain, to address the identified weaknesses and seize opportunities. These strategic guidelines: develop, tend to, change and manage, given the correlation between them, could create positive reinforcement cycles, as depicted in figure 4.

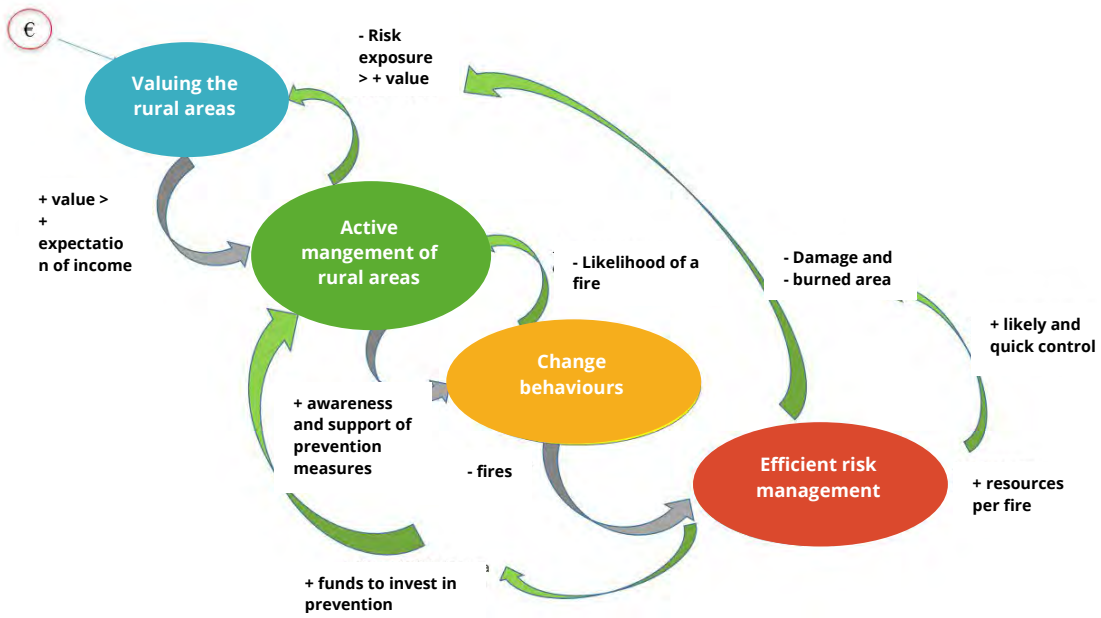


Figure 4. Theory of change: cascade diagram of the positive reinforcement cycles that contribute to efficient risk management, thereby reducing damage and burned area

As already explained, there was insufficient capacity in the past to implement prevention in rural areas and suppression operations focused on protecting the communities. It was noted that prevention measures, to reduce ignitions and clear vegetation, were not implemented in most of the interface. As a result of the lack of coherence between the three pillars and of the suppression trap (Collins *et al.*, 2013), the SNDFCI developed over time, strengthening response to the detriment of prevention, both in rural areas and in the interface. What this strategy proposes is to strengthen the cooperation and coordination mechanisms at national, regional and sub-regional level, designing balanced prevention and suppression programmes adapted to the fire regime of each region, in the rural fire management and the rural fire protection pillars, that is, in rural areas (forests and scrublands) and in the urban-rural interface. For it to become a virtuous cycle, the various aforementioned policies and instruments are used to channel financial resources to empower institutions, achieve the goal to develop the territory, forests and natural capital, reduce exposure to the fire risk through a fuel management, education and community awareness programme and for effective and efficient operational risk management.

The four strategic guidelines are embodied by several strategic goals that seek to capitalise on potential and explore the identified opportunities, thereby reducing vulnerabilities and, to the extent possible, mitigating the threats to the territory.

The strategic goals are the result of the diagnosis made (ITC1 and ITC2), of other reports on the fires of 2017 and on monitoring and evaluations published about the PNDFCI, preliminary studies and international benchmarking analysis, of the joint work carried out with public entities since the end of 2017, of the dialogue with stakeholders, and of the public discussion on the strategy, given that proposals for initiatives have been received.

Each strategic goal is identified by a number in correlation to the strategic guideline to which it corresponds, e.g. SG1.1 corresponds to the first strategic goal of strategic guideline 1, and so on.

The strategic goals are explained in more detail in the Action Plan and the respective targets and indicators quantified.

SG1. VALUING THE RURAL AREAS

To mobilise society and minimise fire risk, the present and future value of goods and services generated in rural spaces must be recognised. It is also necessary to be aware of the direct and indirect losses caused by fires, particularly in terms of the production of wood and other forest products, wide-scale agricultural and livestock production, hunting, fishing, grazing, carbon sequestration, biodiversity, recreation and leisure, land protection, water cycle management and quality, history, landscape and community identity.

This strategic guideline is largely linked to the Portuguese National Spatial Policy Programme (PNPOT) which establishes land development policies, such as adapting territories, paying for services provided with natural capital, expanding the territorial economic base with more knowledge, innovation and training, encouraging collaborative processes to enhance a new land culture and ensuring reduced exposure to risk.

This strategic guideline is linked to spatial planning, which should focus on the sustainable use of land and maximising its social usefulness as opposed to exploiting other potential uses. A rural development strategy requires attracting and establishing economic activities associated with endogenous resources. This means identifying and exploring new ways to create value in goods or services, exploring market niches and diversifying activities to attract and retain people, giving them the opportunity to generate revenue beyond minimum subsistence income. By developing rural areas they become more attractive, perhaps even more so than urban areas, both in terms of quality of life and economic competitiveness. With a view to correcting territorial asymmetries, the territories' potential to attract investment needs to urgently be enhanced, as must the social and economic development of forest activities, and the potential of endogenous resources tapped into, aimed at job creation and retaining assets and economic benefits.

With today's global and local challenges, such as climate change and sustainable development, rural spaces must be developed taking into account strategies and guidelines that are designed for the transition to a green, low carbon, circular and biological economy. More than concepts, they are formulations that focus on preserving biodiversity and enhancing resources, inescapable variables for sustainable development, particularly in rural regions, characterised by the considerable (under-exploited) potential of activities related to the bioeconomy and circular

economy, to multifunctionality, and to sustainable food and agriculture systems, forestry and organic products. The integration of sectoral public policies (environment, forest, industry, energy, agriculture and rural development) and of cross-cutting policies (judicial, fiscal and territorial cohesion) will be key as they will regulate the behaviour of the actors, in particular private actors who own the majority of the territory.

Close harmonisation with other existing plans that are in line with the guidelines for adopting a new land development framework is also essential, be they national or international, such as the PNPOT, PROFs and MMPs. The Portuguese National Spatial Policy Programme (PNPOT) establishes several specific policy measures for land development and changing behaviour, particularly in the management of rural spaces.

These foster a new paradigm focusing on agriculture and forestry as generators of tradable goods and the creation of added value and it is, therefore, essential to ensure solutions for territorial organisation are found to increase the resilience of natural, agricultural and forest systems, and of communities. Furthermore, behavioural change should be reflected in the resilience and adjustment of the people and activities to a new approach to prevention, protection and adaptation, to reducing current vulnerabilities and risks and to recovering from extreme events.

From an economic and financial perspective, harmonisation between this plan and the National Investment Plan, and other sectoral investment plans, is important given the common strategic approach to the sustainability of rural territory. As such, common pathways for cooperation should be sought in innovation, research, qualification, sustainability of the rural territory and development of the interior using resources to diversify the economic base, for competitive rural development, risk prevention, enhancing the environmental and economic potential of forests, biodiversity and promoting agri-environment measures and the circular economy.

G1.1. UNDERSTAND LAND USE AND RESHAPE FOREST MANAGEMENT

This goal will be achieved through programmes for building knowledge of the location, boundaries and ownership of rural and combined land, and of land with no known owner, in relation to simplified cadastral information and the land register, regularly updating land occupation and

determining its present value. It will also be achieved by implementing measures to increase the size of rural lands, amending the succession regime, reviewing taxation on rural land and encouraging the re-parcelling of land and safeguarding partitioning so the size of land helps farms become sustainable and makes it possible to have minimum economically viable crop areas.

G1.2. REDESIGN THE FOREST MANAGEMENT MODEL

Design business models that encourage aggregate management through public and private companies and the scaling-up of the association movement for marketing products, including forest raw materials and services generated in areas with forests and scrublands; encouraging the incorporation of endogenous products such as wood, meat and dairy products in the Portuguese forestry industry, agro-industry and food distribution, with traceability between producers and processors in a transparent business model; and improving the quality and currency of information about forests and their economic use, publishing it periodically. Foster innovation and the increased competitiveness of forestry and agroforestry companies.

Encourage the establishment of management units in areas affected by large fires to ensure the organised and diversified restoration of plant cover. Make the territory economically more attractive, innovative, diversified and competitive, rewarding the creation of positive externalities and penalising those that create negative externalities.

G1.3 PROVIDE LEGAL AND FINANCIAL INCENTIVES FOR DEVELOPING RURAL AREAS

This goal will be achieved through financing and tax incentive measures for management, spatial planning and forest services, mechanisms to offset the loss of income or increased burden associated with promoting environmental services and reducing the vulnerability of forests, providing credit lines for agroforestry management, forest management contracts, financial and tax incentives for forest management entities/units and collective investment undertakings to carry out forestry and silvopasture activities, making aid for extensive livestock farming conditional to good practices in pasture management and the correct use of fire, changing the rural property tax model, mobilising European funds from the common agricultural policy, the rural development

policy, own environmental and forest funds and from PT2030, in line with bioeconomy and circular economy priorities.

SG2. ACTIVE MANAGEMENT OF RURAL AREAS

Being an owner or manager of a rural area (an area with a forest, scrublands, farmland and pastures) involves rights and obligations at a personal, corporate and social level beyond the person's generation. Initiatives must therefore be promoted such that those who are responsible for these spaces ensure that they are used sustainably for their intended purposes, protect them against fires and ensure that they are not a threat to the neighbours, adding danger to or generating negative externalities for the local and global community.

Tending to land and caring for communities requires knowledge of the risks and the ability to anticipate and minimise hazards, the skills needed to take timely and effective action should a fire break out and being willing to contribute to the collective effort to prevent a fire from spreading and having devastating consequences.

SG2.1. DESIGN AND PROMOTE A DIVERSE LANDSCAPE

As part of this strategic goal, programmes and projects for the conversion of stands are expected to be implemented by creating improved pastures and keeping the agricultural area in strategic locations, and also by creating farm management alleys and breaks and discontinuity in farming patches in the forest area, making it difficult for rural fires to spread, thereby creating opportunities for other land uses. This goal also includes programmes to ensure the natural regeneration of indigenous species and the implementation of prevention and management plans for natural parks and high value areas where restoration of the landscape is encouraged. This goal addresses the urgent need to intervene in the restoration of burned areas by creating an emergency and post-fire recovery fund.

SG2.2. REDUCE THE LANDSCAPE FUEL LOAD

Expand the annual fuel management area.

Design and implement a national strategic programme for large-scale fuel load reduction with a multi-annual budget using the existing resources of the various IRFMS entities and developing large-scale silvopasture and controlled fire programmes; ensure the planning and implementation of initiatives to control invasive species and promote the reuse of slash for composting or local biomass-fuelled power generation; and create fuel breaks.

SG2.3 INCREASE THE EFFECTIVENESS OF PEOPLE AND PROPERTY PROTECTION

Reduce the lost value of rural buildings ensuring protection of the community and buildings in specific situations and at local level.

Achieving this goal includes reviewing legislation on the responsibilities associated with and implementation of protection systems through active management of fuel management bands in the secondary system around rural clusters, by creating programmes to improve the safety of buildings and by strengthening financial incentives and penalties for the owners and managers of urban and mixed properties outside of the interface between the consolidated urban area and rural spaces. Programmes with measures that promote the self-protection of people and community safety and the creation of places of refuge will also help to achieve this goal. Strengthening of financial incentives and penalties for owners and managers of properties based on risk is also a relevant enabler.

SG3. CHANGE BEHAVIOURS

Both rural spaces and people are vulnerable to fires and as such citizens must adapt their behaviour to these vulnerabilities, which differ in time and space. The risk profile changes according to weather conditions and the composition, load and structure of vegetation, while that

of people and communities is determined according to their experience, physical condition, age, and culture.

Changing behaviours thus aims at promoting the adoption of best protection practices among the population and at avoiding the unrestricted use of fire, reducing sources of ignition in periods of higher risk, such as waste burning and extensive burns, bonfires, the use of machinery and any source of heat that can trigger a fire, and at informing the population that the techniques used today to manage residue on farms and forests cannot be the same as those used in the past. A smaller and older population that uses fire as a tool may no longer be physically able to control a sudden fire spread. Changing behaviours also means drawing attention to good fire prevention and land management practices and disseminating knowledge.

G3.1. REDUCE HIGHER FIRE RISK IGNITIONS

Reduce the number of ignitions[21] on high fire danger days which, based on the type, location and season can pose a greater threat.

To this end, it is essential to reduce the number and risk of the major causes of ignition, in particular, waste burning and extensive burns, by revising legislation on the use thereof and defining fire management. The capacity for surveillance and deterrence must also be increased, in particular by concentrating surveillance initiatives in critical areas and during critical periods and implementing an integrated surveillance network.

The legal framework for risk behaviours should also be reviewed.

SG3.2. SPECIALISE RISK COMMUNICATION

Implement communication and information mechanisms for the different target audiences and at the various regional and local levels, integrating the different IRFMS processes.

[21] Does not include natural ignitions.

This goal will be achieved by following an integrated and specialised communication strategy targeting people of all ages living in cities and in rural areas and tourists that shares information on the value of goods and services generated in the forest sector and on good fire prevention practices, and which includes warning and alert mechanisms[22] in a crisis designed for the target audiences. The integration of teaching practices focusing on fire risks in primary and secondary education is equally important from a structural and long-term perspective.

SG4. EFFICIENT RISK MANAGEMENT

Risks cannot be totally prevented, nor can we stop fires from occurring in the national territory. However, it is possible and necessary to know where they are likely to occur in the various pyroregions over time and predict their possible impact on the environment, economy and society. Only thus can we design the balanced interventions needed to reduce the likelihood of threats taking place, lessen the negative impacts if they do occur (or harness the positive effects of fire), and programme and prioritise fire prevention and suppression operations in order to minimise and mitigate the impact and ensure a quicker rehabilitation of the land and communities affected by the fires.

Efficient risk management not only helps reduce actual negative impacts, but also increases the confidence of populations, thus promoting an adequate occupation and exploitation of the territory.

The perception of risk must be addressed in order to manage the risk properly so that the community is informed about all factors that can influence the risk and their relative importance. It is also necessary to develop information mechanisms that ensure objectivity, accuracy and

[22] Warning: Notice disseminated to the population potentially affected by the imminence or occurrence of a major incident or disaster that provides information about the event concerned and the self-protection measures to be implemented which can be used as an early warning or action warning, depending on the purpose thereof;
Alert: notice disseminated to the civil protection system regarding the imminence or occurrence of a major incident or disaster that includes information essential to understanding the situation and enables additional protection and relief activities to be triggered, based on the principles set out in the Integrated Protection and Relief Operations System (SIOPS).

timely communication. Risk communication must be supported by evidence and consolidated knowledge, provided by communication experts, and be appropriate to each target segment. In case of danger, warnings must focus firstly on how to behave.

Within the institutional setup, governance practices, information and decision-making systems and the technical training of stakeholders must be improved. In fact, the strengthening of inter-agency cooperation and coordination has significant room for improvement, based on a model of education, recognition and certification of skills. As the problem and the issue of having so many stakeholders is so complex, giving rise to many opinions and sometimes even opposing suggestions, results, assessments and communication must be monitored to establish a risk governance model appropriate to the IRFMS's challenging vision. To this end, efforts must be made to encourage inter-agency cooperation and trust, promote the sharing of data, knowledge and experience, and consolidate institutional cultures and rules to foster merit and continuous improvement cycles.

Also of note is the creation of a budgetary provision that expedites the mitigation of the consequences of fires for small and medium-sized farmers and the inclusion of fires and crop loss in agricultural insurance.

SG4.1. IMPLEMENT INTEGRATED PLANNING BY INCLUDING RISK ASSESSMENT

Draw up an annual plan that includes multi-annual perspectives and incorporates the different work processes, the various entities and the different territorial levels. This planning includes a structural and cyclical risk assessment.

To achieve this goal, several things need to be done, including conducting a survey of biomass and fuel load, mapping erected buildings and facilities of significant value and the respective generation of the various risk maps, ensuring accurate and good weather information, developing coordination mechanisms to prepare and approve the plan and the respective budget.

SG4.2. IMPLEMENT AN ENABLING RISK GOVERNANCE MODEL

Establish institutional relationships for data collection, analysis, decision-making and communication of the risk of rural fires to ensure adequate preparedness.

This goal comprises programmes that boost the effectiveness of the law, enhance the risk governance competences of the institutions, define supranational policies, implement a continuous improvement system, and develop effective and efficient integrated information systems and communication systems.

SG4.3. REDESIGN RESOURCE MANAGEMENT

Scale-up processes and resources so as to ensure greater effectiveness and efficiency, incorporating relevant international standards and encouraging the professionalisation of resources.

Study and analyse scenarios and decide on the definition, scale, positioning and rules of engagement given the risk to prevention, surveillance and suppression crews, based on best international practices and the best knowledge available in the national scientific community.

This goal includes, in particular, building the capacity of the institutions both in terms of human resources and equipment, which is essential to supporting the holistic implementation of the plan throughout the year.

SG4.4. INCREASE THE QUALIFICATION OF IRFMS AGENTS

Build the skills of all IRFMS agents, thereby guaranteeing the principle of specialisation and enabling them to provide the required professionalism in certain activities and expanding knowledge.

Implementation will be defined under the national qualification programme for IRFMS agents, taking into account the vocational and skills profiles based on a model for education, recognition

and certification of skills, in collaboration and coordination with knowledge centres (e.g. ForestWISE) and sharing international best practice experiences.

Implementation of these strategic goals falls within the scope of the IRFMS, the process chain of which is explained in detail in a dedicated document.

5.2. TARGETS

These goals contribute towards achieving the following targets set for this National Plan.
Portugal will be protected against severe rural fires when, despite the likely increase of the fire risk:

- the loss of lives in fires, although possible, is rare;

- the ratio of fires extending across more than 500 ha is below 0.3% of the total number of fires;

- the cumulative burned area over a period of a decade is less than 660,000 ha (to be revised by 2023 to a figure that takes into account the loss of goods and services).

06 MAIN LEGISLATIVE IMPACTS

Implementing the IRFMS requires amendments to be made to laws that established the former mechanisms, including, from the outset, to Decree-Law No. 124/2006, of 28 June 2006, which should be completely rewritten. This intervention also includes Decree-Law No. 134/2006, of 25 July 2006, approving the Integrated System for Protection and Relief Operations (SIOPS). The rewriting of the Law No. 65/2007, of 12 November 2007, regulating municipal civil protection should also be considered so as to ensure local authorities adapt to the challenges the NPIRFM poses. Equally important is a review of all legislative acts resulting therefrom, such as, inter alia, the Regulation on the Organisation and Operation of Structural Prevention Crews, the Single Directive on Fire Prevention and Suppression, and the Regulation on Technical Fires. Drafting legislative proposals concerning government intervention in the restoration of burned areas is also important. All these legislative acts should serve to underpin the new System, which entails vertical reporting mechanisms and centralised planning.

The IRFMS envisages new fire prevention methods with an impact on spatial planning and new spatial planning options, forms of fuel management and forest planning. These new directives must be gradually implemented by public authorities, but also by private operators who in some way exploit forest resources. This implies reviewing forest fire protection planning instruments, such as Municipal Plans and Intermunicipal Forest Fire Protection Plans. Indeed, the new System will only be fully operational when the guidelines have been implemented at local level, which are dependent on such reviews.

The rewriting of Decree-Law No. 124/2006, of 28 June 2006, also involves changing all the operational choices it established that require review, particularly those concerning rural fire prevention. In this case specifically, it should be noted that the future legislative act should lawfully set out only matters that, pursuant to the Portuguese Constitution, require legal provision, leaving technical and non-statutory matters and aspects to the regulatory sphere, providing the flexibility required to facilitate the continuous updating thereof.

Pursuant Forest Policy Law (No. 33/96, of 17 August 1996), the IRFMS aims at the national, regional and sub-regional organisation of the planning and coordination of fire prevention and detection and collaboration in fire suppression, which is now provided for under the organic law published for ICNF, I.P. However, there are other implications when it comes to legislative acts that govern

the operation of public authorities, which require the approval of legal norms. Particular attention should be paid to legal frameworks for the operationalisation of new mechanisms for the coordination and financial implementation of the IRFMS, which includes reviewing the Regulation on the Permanent Forest Fund, creating a special framework for financing and granting public subsidies (related to Decree-Law No. 167/2008, of 26 August 2008) to ensure they are in line with the IRFMS's new goals. The same applies with regard to the Municipal Property Tax Code or review of the criminal code, the definition of rural fire and the amendment of the succession regime, as proposed in the action plan.

Legislative intervention also covers matters concerning land registration and expropriation. As such, for the IRFMS to be successful, it is essential to increase the areas covered by land registration or, in the absence thereof, by simplified cadastral information. Moreover, the simplified cadastral information scheme and the land registration scheme confer legitimacy to ICNF, I.P. to organise procedures for georeferenced graphical representation and to implement land registration for forest planning and, if necessary, the expropriation of land.

The same legal capacity should be granted to ICNF, I.P., under the Expropriation Law, giving it, in particular, the authority to conduct expropriations by zone in cases of rural fire prevention or other measures provided for under the Basic Law on Forest Policy, which are pending regulation.

07 MONITORING AND EVALUATION

Within the scope of this Plan, the concepts of monitoring and evaluation (M&E) are used in the sense promoted by organisations such as the OECD and those that are part of the United Nations. As such, monitoring is the *continuous function that uses systematic collection of data on specific indicators to provide management and stakeholders of an ongoing intervention with indications of the extent of progress and achievement of objectives and progress in the use of allocated funds*. Furthermore, *evaluation is the systematic and objective assessment of the merit or worth of an intervention.*

The M&E system is a core and essential management tool used to determine the Plan's performance to inform management decisions based on evidence and, thus, introduce rationality into the decision-making process.

As a public policy instrument, this Plan must have an M&E system that enables the timely and rigorous monitoring of progress made and decision making on the preventive and/or corrective measures needed to ensure that the targets are met. To this end, a responsive M&E system that meets the information needs of the various stakeholders must be developed, thereby addressing the weaknesses referred to in the monitoring and evaluation of the PNDFCI[23].

This plan, therefore, establishes the roadmap for building a results-oriented M&E system, setting out the guiding principles and architecture for coordination and management of the evaluation component.

Priority must be given to reconciling and standardising evaluation practices given the geographic dispersion of the system's stakeholders and the resulting multiplicity of data collection systems. Without addressing the weakness identified in data collection, systematisation and regular data processing mechanisms, any future evaluations will be spurious and will not add value to decision making.

[23] Available at http://www2.icnf.pt/portal/florestas/dfci/planos/PNDFCI.

It is, therefore, important to determine the System's current monitoring and evaluation capabilities to then address any weakness and better the M&E system by adapting it to the needs resulting from the goals and indicators on which the Plan is based.

Complex social problems require an integrated governance model and, as demonstrated by previous evaluations, the nature of the Plan, and of the M&E System, entails the need for a management and operationalisation model suited to the multiplicity of actors and responsibilities.

Forming a coordinating unit for the M&E component of the Plan ensures that M&E activities are carried out on a regular basis, facilitating the drawing up of annual implementation reports and the management of internal and external evaluation processes.

This unit, which answers to AGIF, I.P, comprises representatives of the system entities as well as other relevant entities, as data providers in the M&E process. It is responsible for designing the M&E plan, identifying information gaps, standardising guidelines, ensuring that relevant information is available for establishing indicators, supporting the drawing up of the annual monitoring and implementation report, supporting the formulation of terms of reference, and procuring evaluations. This monitoring report informs the enabler of the governance process.

An interim and final evaluation must be mandatorily carried out of each implementation block provided for in the Plan, that is, the interim evaluation must be carried out in 2024 and the final evaluation in 2031, notwithstanding other targeted and periodic evaluation initiatives, based on the information needs of the stakeholders included in the evaluation plan.

The evaluation terms of reference will be based on assessment questions, according to relevance, effectiveness, efficiency, sustainability and other appropriate criteria.

In view of the above, assessment points relate directly to the strategic goals set under the Plan. However, aspects linked to the Plan's reasoning for the intervention may also be considered.

The Plan's M&E system will be fed by data collected from different already established sources: the IRFMS; the financial instruments implementation database related to operational programmes; formal statistics; the Forester-Firefighter Programme Information System; administrative information gathered from the beneficiaries and stakeholders of the Plan, such as

IPMA, I.P., ANEPC, GNR, ICNF, I.P., forest producers, the Institute of Medical Emergency (INEM, I.P.), the managing authorities of operation programmes, the Forest Fund, among other entities.

The development of an interoperable online platform for use by public and private entities, with a geographical component to gather, centralise and make available information on planning, forecasting, decision support, expeditious assessment of potential losses and of damage, and rural fire management, as provided for in Article 12(c) of Resolution of the Council of Ministers No. 12/2019, of 21 January 2019, will be essential to the Plan's M&E component.

The public communication and dissemination of monitoring and evaluation results is an integral part of the Plan’s communication strategy, which must enable an understanding of the resulting dynamics not only by experts but also by the panoply of stakeholders and, ultimately, all citizens.

As regards the resources allocated to monitoring and evaluation, it is important to stress the need to provide training to the organisations involved so as to ensure they have the required technical and technological skills. In this area we believe that financial resources should be allocated to the following areas of the M&E component:

- Qualifying human resources;
- Improving the M&E system;
- Procuring external assessments;
- Communication and dissemination activities.

Carrying out M&E, as provided for, involves following the principles of independence, impartiality, credibility, transparency and usefulness, as established in the international standards in force.

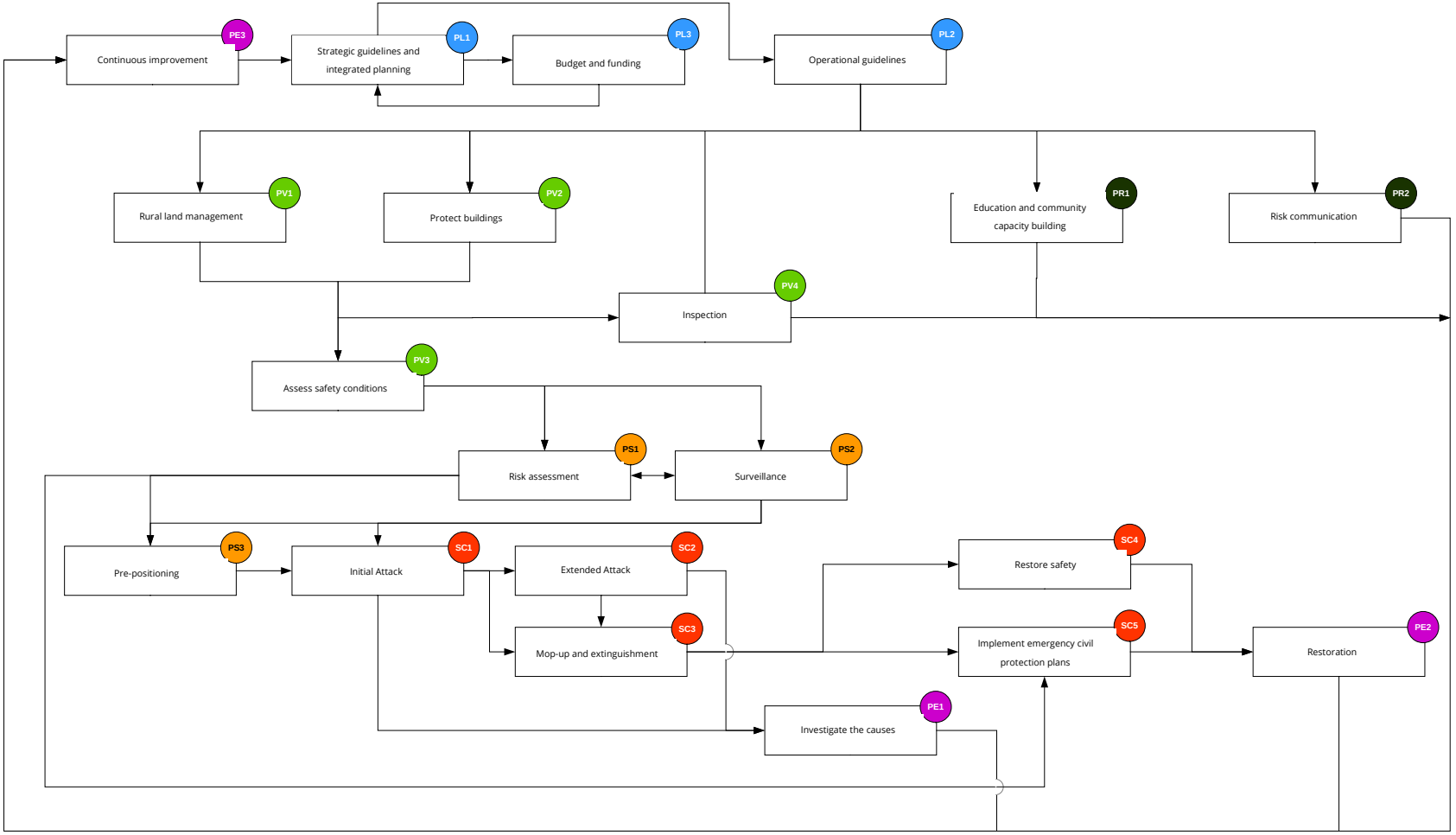


Figure 2. Major processes in the IRFMS process chai

08 MAJOR PROCESSES

ASSIGNMENT OF RESPONSIBILITIES

Responsibilities are assigned under the processes depicted in this annex so as to inform the System partners what is expected of them under this model. Responsibilities are assigned according to a RASCIFAa model based on the acronyms indicated below. In principle, there is only one responsible entity (R). However, when more than one is indicated such should be associated with their respective specialisation (RFM or RFP).

ACRONYM	MEANING
CE	**Coordinating entity** The entity that coordinates and promotes implementation of the process.
R	**Responsible entity** The entity that carries out the intervention, either autonomously or by procuring resources from other entities for such purpose. It is responsible for the implementation determined and approved by the approving entity (A).
A	**Approving entity** The entity that approves an initiative, validating the strategic option and implementation plan proposed by the R entity and authorising it to incur expenses and/or move forward as planned if the initiative has not been delegated to it.
S	**Supporting entity** The entity(ies) that support R in carrying out an initiative, providing resources to do so.
C	**Consulting entity** The entity(ies) that are consulted before, during and after an initiative and are expected to issue an opinion, make a technical contribution or draw up an impact report.
I	**Informing entity** The entity(ies) that are informed before, during and after an initiative and are expected to implement measures to prepare for, guard against or adapt to the impact of the initiative.
F	**Inspecting entity** The entity that checks implementation of an initiative, confirming compliance with the applicable norms.
Aa	**Assessing and liaising entity** The entity that assesses the outcome of an initiative and liaises between entities for resource sharing and the concerted definition of the strategy.

ENTITIES AND CONVENTIONS

In the process data sheets of this annex, the processes are identified by a number in square brackets, e.g. [1], while problems are identified by a letter between the *less than* and *greater than* symbols, e.g. <A>. Processes are identified by their identifier enclosed in double brackets, like so ((PR1)).

The entities below are associated with the RASCIFAa model used to assign responsibilities which, whenever possible, are identified by their acronyms or other reference. The list of entities is not exhaustive and the core IRFMS entities may ask for assistance from other entities with capabilities that are relevant for the process. All responsibilities assigned under the RASCIFAa model are centred around the entities that intervene directly in the processes; other entities, although very relevant but which intervene occasionally have not been included.

REF./ACRONYM	ENTITY
AF	Air Force
AGIF, I. P.	Agency for Integrated Rural Fire Management (Agência para a Gestão Integrada de Fogos Rurais, I.P.)
ANEPC	National Emergency and Civil Protection Authority (Autoridade Nacional de Emergência e Proteção Civil)
APA, I. P.	Portuguese Environment Agency (Agência Portuguesa do Ambiente, I. P.)
AT	Tax and Customs Authority
CB	Firefighter Corps (Corpo de Bombeiros)
CC	Citizens
CCDR	Regional Development and Coordination Committees (Comissões de Coordenação e Desenvolvimento Regional)
CGE	Central government entities
CIM	Intermunicipal Community (Comunidade Intermunicipal)
CM	City or Town Council (Câmara Municipal)
CMGIFR	Municipal Committee for Integrated Rural Fire Management (Comissão Municipal de Gestão Integrada de Fogos Rurais)
CMIN	Council of Ministers
CNGIFR	National Committee for Integrated Rural Fire Management (Comissão National de Gestão Integrada de Fogos Rurais)

CRGIFR	Regional Committee for Integrated Rural Fire Management (Comissão Regional de Gestão Integrada de Fogos Rurais)
CSGIFR	Sub-regional Committee for Integrated Rural Fire Management (Comissão Sub-Regional de Gestão Integrada de Fogos Rurais)
DGAV	General Directorate of Food and Veterinary Medicine (Direção-Geral de Alimentação e Veterinária)
DRA	Regional Directorate of Agriculture and Fisheries (Direção Regional de Agricultura e Pescas)
FFAA	Armed Forces
FPO	Forest Producer Organisations (Organizações de Produtores Florestais)
GNR	Republican National Guard (Guarda Nacional Republicana)
ICNF, I. P.	Institute for Nature Conservation and Forests (Instituto de Conservação da Natureza e Florestas, I.P.)
INEM, I. P.	National Institute of Medical Emergency (Instituto Nacional de Emergência Médica, I.P.)
IPMA, I. P.	Portuguese Institute for the Sea and Atmosphere (Instituto Português do Mar e da Atmosfera, I.P.)
ISS	Institute of Social Security (Institute of Social Security, I.P.)
MA	Metropolitan Areas
LGE	Local government entities
MF	Ministry of Finance
ORE	Other Relevant Entities (stakeholders and knowledge groups)
PJ	Portuguese Criminal Police (Polícia Judiciária)
PRV	Private Entities (including AFOCELCA, among others)
PSP	Public Security Police
SGMJ	General Secretariat of the Ministry of Justice

Acronyms in alphabetical order

PL1

STRATEGIC GUIDELINES AND INTEGRATED PLANNING

The strategic guidelines define national guiding principles and define the activities of the system's agents. These guidelines are used to set goals to be achieved within a certain time frame. Although it is a national strategy, it is up to the levels closest to the people and landscape to assess and interpret the national guidelines, and to indicate the resources required to achieve such goals.

Given the interdependence between the plan and the underlining budget, it is important to establish a timetable for each step of the process, based on the current legislative schedule, particularly the approval date of the State Budget Law.

Once some of the steps have been taken, we'll have balanced system with tangible targets that the agents on the ground will be able to implement in a timely and cost-effective manner.

[1] Risk assessment		CE: AGIF, I. P.
R	ICNF, I. P.	Planning entails the use of rural fire risk maps, including rural fire danger maps, which are used to identify land where fires are most likely to occur and can be more severe, to help prioritise integrated planning initiatives. Risk assessment also takes into account the establishment of priority areas for prevention and safety (PAPS), which correspond to the 'high' and 'extremely high' fire danger classes and may include other areas, albeit less hazardous, where there is a recognised interest in protecting them and provided they are included in the planning instrument. Rural fire risk maps should be adjusted to the cyclical risk for the year in terms of susceptibility, exposure and weather scenarios.
A	AGIF, I. P.	
S	IPMA, I. P.	
C	ANEPC, DGT	
I		
F		
Aa		

[2] Plan the Integrated Rural Fire Management System		CE: AGIF, I. P.
R	AGIF, I. P.	

A	CMIN	It is incumbent upon AGIF, I.P. to coordinate the drawing up of the National Plan for Integrated Rural fire Management, which includes the National Action Plan (NAP) establishing the strategic guidelines that are then interpreted and analysed by each region, which in turn establishes the strategic guidelines for the Regional Action Plan (RAP) that is used by the lower planning levels. The NAP is a dynamic, multi-annual document that is reviewed every year, and is assessed and reviewed periodically in the continuous improvement process, incorporating the contributions from the various levels of planning and implementation. When there is a geographical coincidence between instruments, these will be combined into a single instrument with the designation of greater value taking precedence. The first iteration <A>, after the NPIRFM has been approved, involves the public and private entities being called upon to indicate what is needed [3] in order to achieve the goals set in the NAP.
S	CNGIFR	
C	ORE, CM	
I	CGE, LGE, PRV	
F		
Aa		

[3] Identify needs under a Municipal Implementation Plan		**CE: AGIF, I. P.**
R	CMGIFR	At municipal level, the Municipal Committees for Integrated Rural Fire Management (CMGIFR) determine the involvement of the local private entities (PRV) and of the local government entities (LGE) in identifying what is needed together with the CSGIFR. The CMGIFR summarises these needs in proposals for the Municipal Implementation Plan (MIP), in line with the CSGIFR guidelines, including: • Defining initiatives; • Related mapping; • Implementation indicators; • Targets; • Time table; • Type of resources and scale; • Budget and source of funding.
A		
S	LGE, CB, PRV	
C	CSGIFR	
I		
F		
Aa		

[4] Consolidate needs under a Sub-Regional Action Plan		**CE: AGIF, I. P.**
R	CSGIFR	The Sub-regional Committees for Rural Fire Management (CSGIFR) determine the involvement of the multi-municipal private entities (PRV) and of the central government entities (CGE) in identifying what is needed in order to achieve the goals set in the NAP. Once needs have been identified [3], the CSGIFR standardise and consolidate the plan to be implemented, which means not only ensuring territorial continuity and studying scale advantage for implementation of the plan by using more efficient providers, but also establishing priorities that go beyond local level. The CSGIFR draw up proposals for the Sub-regional Action Plan (SRAP), which include: • The plan, scale and budgets for CGE; • The plan, scale and budgets for LGE; • The plan, scale and budgets for PRV;
A		
S	CGE, PRV	
C	CRGIFR	
I	CMGIFR	
F		
Aa		

[5] Consolidate needs under a Regional Action Plan		CE: AGIF, I. P.
R	CRGIFR	The CRGIFR evaluate the PSGIFR proposals by consolidating them at a regional planning level, comparing the goals set in the RAP to confirm the compliance, timetable and budget thereof. The CRGIFR may suggest changes to the plan provided for in [3] and [4] before submitting the RAP proposal such that it may be included in the wording of the NAP [2].
A		
S	CGE, PRV, ORE	
C	CNGIFR	
I	CSGIFR	
F		
Aa		

[6] Transposition into land management instruments		CE: AGIF, I. P.
R	CM	The Rural Fire Management Planning process [2], which includes determining the needs under the MIP [3] and SRAP [4], culminates with the transposition of the MIP/SRAP into the Municipal Master Plan (MMP) to ensure efficient implementation thereof. The MIP clearly identifies the constraints, general regulatory rules and, in an implementation system, the locations, time table and resources required, along with forecasting and planning the interventions of the different entities in all stages of the system's process chain for inclusion in the MMP.
A		
S	CMGIFR, CCDR	
C	CSGIFR	
I		
F		
Aa		

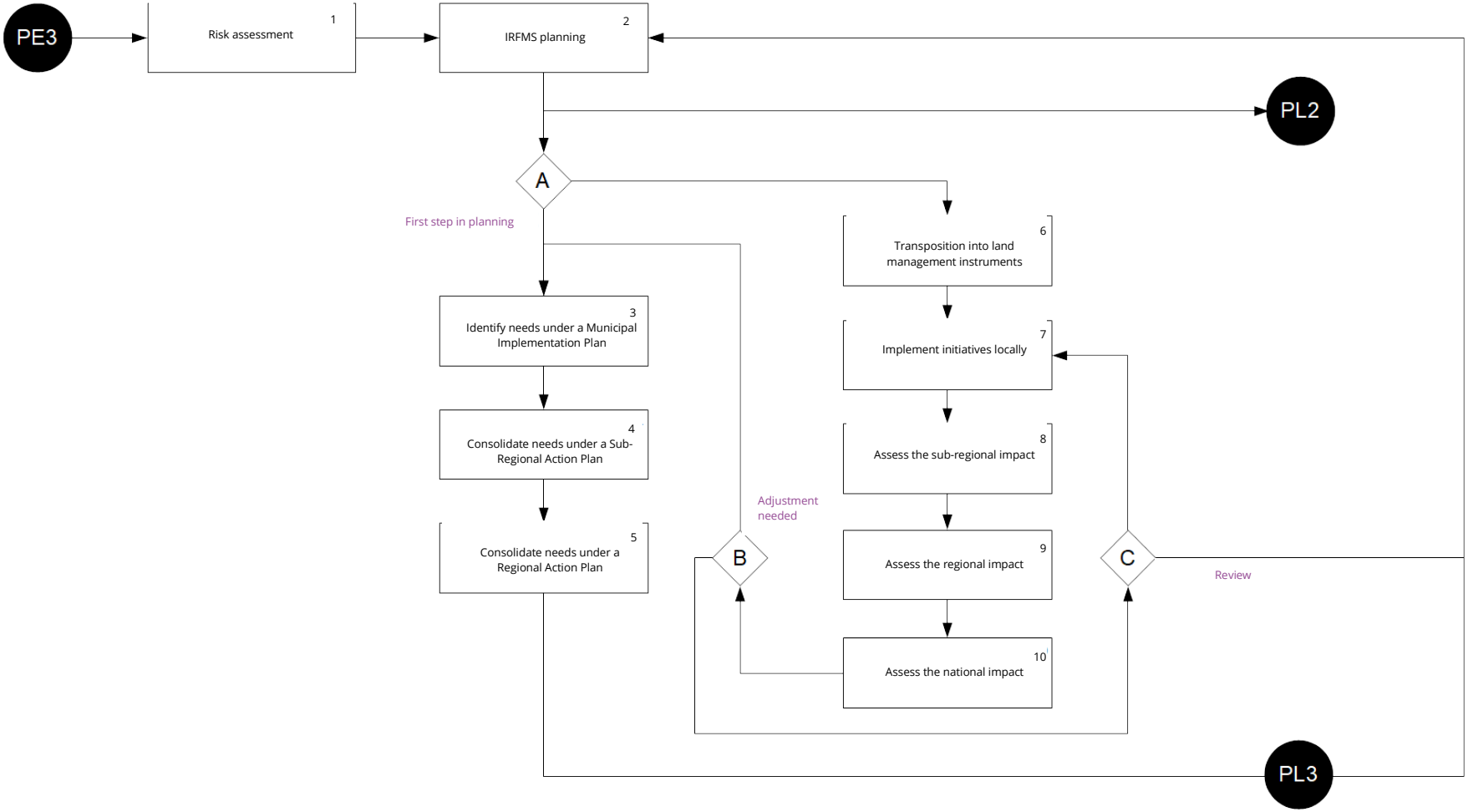
[7] Implement initiatives locally		CE: AGIF, I. P.
R	CGE, LGE, PRV, CC	The entities implement the initiatives provided for in the SRAP [4] on the ground to achieve the rural fire management goals in each territory. All implemented initiatives are registered, with georeferencing, on the interoperable rural fire management platform and made available to all IRFMS entities which will then use the information to manage their prevention and suppression activities and all other stages of the process chain.
A		
S	GNR, FPO, CB, PRV, CC	
C		
I		
F	GNR, ICNF, I. P., ANEPC, CM, PSP	
Aa	AGIF, I. P.	

[8] Assess the sub-regional impact		CE: AGIF, I. P.
R	CSGIFR	Implementation of the plan provided for in [7] implies the monitoring and evaluation of the resulting impacts at sub-regional level so as to determine the effectiveness thereof with a view to introducing immediate corrective measures for continuous improvement ((PE3)). These results are then communicated to the top-level hierarchies in the organisations.
A		
S	CMGIFR	
C		
I	CRGIFR	

F		
Aa	AGIF, I. P.	

[9] Assess the regional impact		**CE: AGIF, I. P.**
R	CRGIFR	The organisations with regional responsibility collate the respective sub-regional impact reports [8] and assess the need for higher level reporting for correction or possible immediate correction using other resources, service providers and different implementation schedules. The options decided upon at regional level are reported at national level.
A		
S	CSGIFR	
C		
I	CNGIFR	
F		
Aa	AGIF, I. P.	

[10] Assess the national impact		**CE: AGIF, I. P.**
R	CNGIFR	The organisations at the national analysis level receive the reports submitted by the various regions [9] and assess to what extent the goals set for the plan are affected. When they are affected and adjustments need to be made to the plan <B>, the CSGIFR are urged to review what is needed in order to achieve the goals [4], launching a new iteration that involves revising the NAP. When they are not affected, implementation of the plan continues as planned, except when the time comes to review the NAP <C> according to legal deadlines, which involves repeating the consultation and evaluation processes indicated in [3] and [6]. The NAP may, therefore, be subject to review for two reasons: either because the impact assessment so requires when goals are affected or because the legal deadlines so determine.
A		
S	CRGIFR	
C		
I		
F		
Aa	AGIF, I. P.	



Flow chart PL1. Strategic guidelines and integrated planning

PL2

OPERATIONAL GUIDELINES

The operational guidelines provide strategic guidelines for specific initiatives to be carried out in organisations and operations, focusing on procedure and designing standard responses that can be implemented anywhere in the territory and by an qualified agent.

The operational guidelines also include targeted programmes for very specific problems, for which individual initiatives are designed for clearly identified locations and situations.

[1] Operational guidelines		CE: AGIF, I. P.
R	ANEPC, FFAA, AF, GNR, ICNF, I. P.	The entities draw up the operational guidelines with a view to standardising procedures for intervention in both rural fire management and rural fire protection. These operational guidelines establish, among other things, the who, where, when and how of a particular initiative and to whom it is reported.
A	Supervisory authority	
S		
C	ANEPC, FFAA, AF, GNR, ICNF, I. P., AGIF, I. P., CB, FPO, LGE	
I	Entire system	
F		
Aa	AGIF, I. P.	

[2] Permanent implementation rules		CE: AGIF, I. P.
R	ANEPC, FFAA, AF, GNR, ICNF, I. P.	The type of response for each situation is described in the permanent implementation rules that each entity draws up, so as to ensure a standard procedure that is clearly understood by those implementing it.
A		
S		
C	ANEPC, FFAA, AF, GNR, ICNF, I. P., AGIF, I. P., CB, FPO, LGE	
I	Entire system	
F		

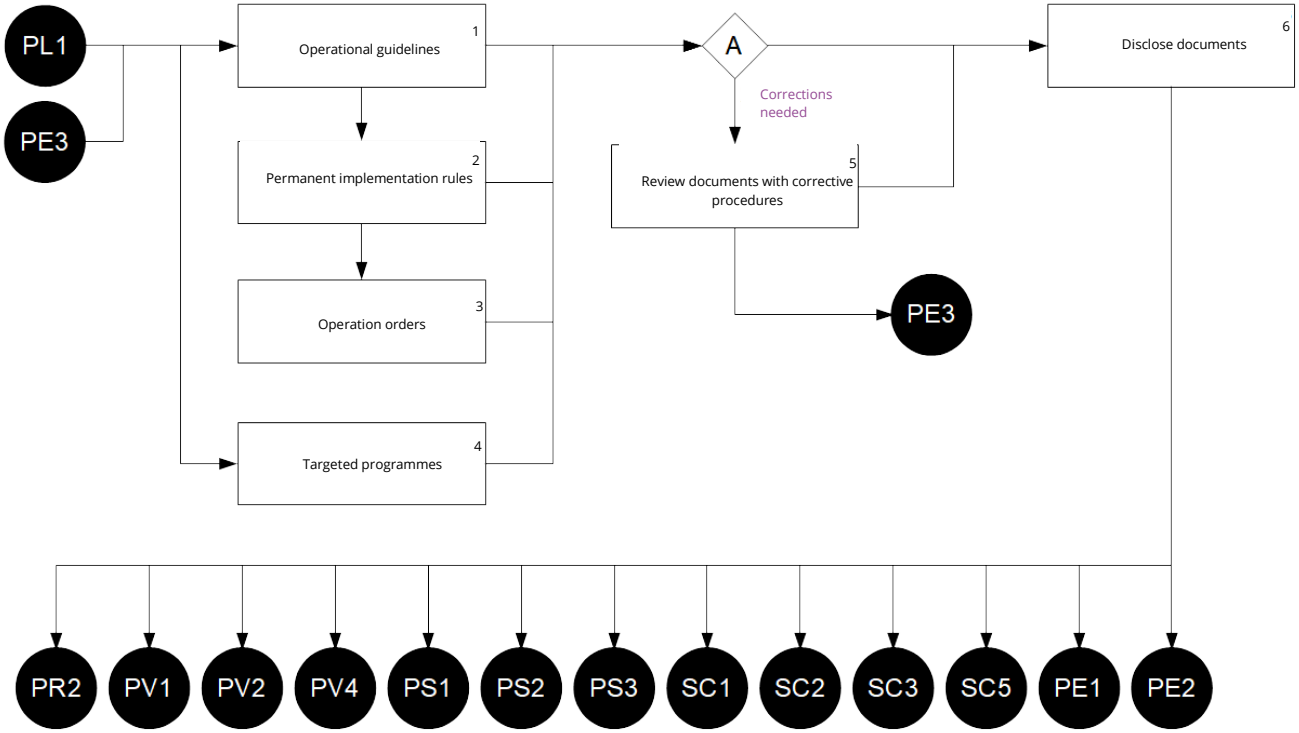
Aa	AGIF, I. P.	

[3] Operation orders		**CE: AGIF, I. P.**
R	ANEPC, FFAA, AF, GNR, ICNF, I. P.	The entities issue operation orders with the minimum scope and detail required to implement a particular initiative aimed at achieving the goals set in their respective internal operational guidelines.
A		
S		
C	ANEPC, FFAA, AF, GNR, ICNF, I. P., CB, FPO, LGE	
I	Entire system	
F		
Aa	AGIF, I. P.	

[4] Targeted programmes		**CE: AGIF, I. P.**
R	ANEPC, ICNF, I. P.	Programmes are designed for very specific problems to eliminate or mitigate their effects. These programmes require a development that differs from the linearity of the directives, rules or orders and, as such, the language and recipients differ from other documents. A targeted programme, which is always an operational document for implementation, may be used, among other things, to reduce ignitions, protect people and property or reduce the landscape's susceptibility to fire.
A	Supervisory authority	
S		
C	AGIF, I. P., ANEPC, FFAA, AF, GNR, ICNF, I. P., PJ, CB, FPO LGE, ORE	
I	Entire system	
F		
Aa	AGIF, I. P.	

[5] Review documents with corrective procedures		**CE: AGIF, I. P.**
R	ANEPC, FFAA, AF, GNR, ICNF, I. P.	Where continuous improvement ((PE3)) results in corrections to the procedures followed in <A>, the existing operational documents are reviewed.
A		
S		
C	CB	
I	Entire system	
F		
Aa	AGIF, I. P.	

[6] Disclose documents		CE: AGIF, I. P.
R	ANEPC, ICNF, I. P.	Operational guidelines are public and made broadly available on interoperable rural fire management platforms. Disclosure is based on the classification of the documents, where applicable, and sections of limited distribution are redacted, when deemed appropriate.
A		
S	AGIF, I. P., CB	
C		
I	Entire system	
F		
Aa	AGIF, I. P.	



Flow chart PL2. Operational guidelines

PL3

BUDGET AND FUNDING

The Integrated Rural Fire Management System, given its inter-ministerial nature, must be geared towards establishing a cross-cutting budgetary programme, allowing for effective management and monitoring of performance.

The multiplicity of stakeholders involved in the system requires convergence on intervention and complementarity of funding, in addition to raising and maximising different sources of funding.

The rationality of the appropriation of resources – human, financial and material –, implies new ways and models of management which include the State's central administration, local government and stakeholders from the private sector.

[1] Strategic guidelines		**CE: AGIF, I. P.**
R	AGIF, I. P.	Following ((PL1)), IRFMS entities and other partners begin the process of multi-annual budgeting and funding taking the NAP into account.
A	CGE	
S		
C	ANEPC, ICNF, I. P.	
I		
F		
Aa		

[2] Diversify SGIFR sources of funding		**CE: AGIF, I. P.**
R	AGIF, I. P., CGE	Diversify IRFMS sources of funding by expanding the range of alternatives to the State Budget, namely by raising Community and other available funds to fulfil the purposes of the system.
A		
S	CCDR, PRV	Identify synergies and budget complementarities between the various public and private entities with responsibilities in the system.
C	ORE	
I		

F		
Aa		

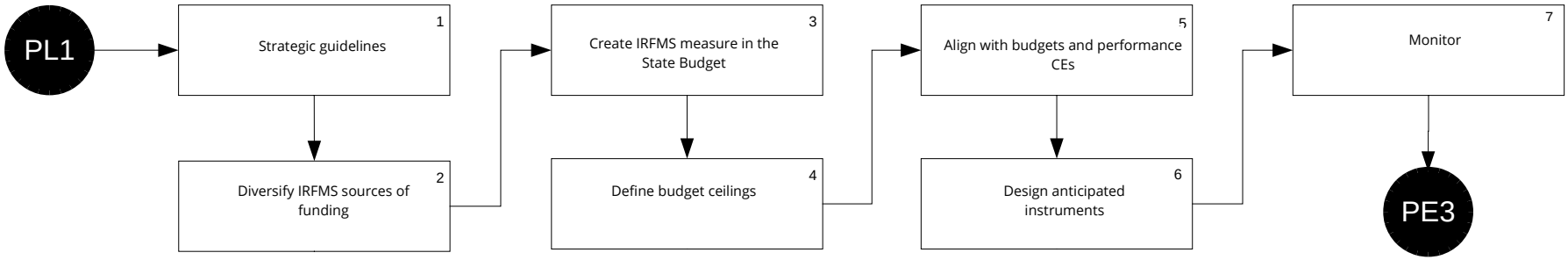
[3] Create IRFMS measure in the State Budget		**CE: MF**
R	AGIF, I. P.	Create a specific measure in the State Budget for the IRFMS and the respective activities under the instruction circular issued by the Directorate-General of Budget with instructions for preparing the State Budget. Implementation of the IRFMS measure will allow for the establishment of a cross-cutting operational programme, coordinated and monitored by the Presidency of the Council of Ministers. The budget breakdown of the funds to be allocated to the IRFMS under the measure is the basis for producing timely and accurate budget management information, which will inform the political and strategic decision on the system.
A	CMIN	
S		
C		
I		
F		
Aa		

[4] Define budget ceilings per budgetary programme		**CE: AGIF, I. P.**
R	AGIF, I. P.	At this stage, a comprehensive view is provided of what resources – human, financial and material –, are needed for the system, in light of the occasional and ongoing procurement needs for the system, namely through centralised acquisition of resources, and the respective budgetary impacts. AGIF, I.P. issues an opinion on the annual budget proposals for the integrated rural fire management budget concerning the two components, rural fire management and rural fire protection.
A	CMIN	
S		
C		
I		
F		
Aa		

[5] Align with coordinating entities' budgets and performance		**CE: AGIF, I. P.**
R	AGIF, I. P.	Following approval of the NAP ((PL1)), and taking into account possible adjustments resulting from the setting of ceilings, the activities and amounts to be budgeted in year N specifically for the IRFMS must be submitted to the coordinating entities of budget and performance of the respective areas of governance.
A	CGE	
S		
C		
I		
F		
Aa		

[6] Design anticipated instruments for the IRFMS entities		CE: AGIF, I. P.
R	AGIF, I. P.	The initiatives provided for in the NAP should inform the guidelines of the coordinating entities as regards the design of their management instruments so as to ensure the necessary strategic alignment. The IRFMS entities must reflect any changes proposed under the NAP in the Action Plan and Evaluation and Accountability Framework (QUAR), depending on the level of intervention, and in the staff establishment plan and budget.
A	CGE	
S		
C		
I		
F		
Aa		

[7] Monitor		CE: AGIF, I. P.
R	AGIF, I. P.	AGIF, I.P. periodically gathers and consolidates information on the budgetary and physical implementation of the initiatives provided for under the NAP. Monitoring the level of implementation of the initiatives and the budget helps in issuing recommendations for mitigating identified constraints, budgetary reallocation (flexible management) within the system and the flagging of progress made. This flow provides feedback for the continuous improvement process ((PE3)).
A		
S	ORE	
C		
I		
F		
Aa		



Flow chart PL3. Budget and funding

PR1

EDUCATION AND COMMUNITY CAPACITY BUILDING

Developing, implementing and integrating education and training programmes is key for people, communities, entities and stakeholders to have an understanding of the fire risk, ecology and fire management. This will drive changes in behaviour and the implementation of self-protection measures through the active participation of citizens and society at all times when it comes to incorporating good practices into their daily lives. Educating and empowering communities is also essential to ensuring more effective risk communication.

[1] National Fire Management Education Plan		CE: AGIF, I. P.
R	AGIF, I. P.	Develop and implement a National Fire Management Education Plan that ensures not only the integration and standardisation of theoretical and practical content about fire management in the various already established education programmes, but also the introduction and continuity of said content in the curricula of the official education system. With the endorsement of the Portuguese Republic, this process should consider the following priority target groups: • Children, particularly those attending primary school; • Adolescents and young people (16- 20 years old); • Older people (over 65); • Professionals and/or individuals who carry out risk activities associated with fires resulting from negligence (forest entrepreneurs, pastoralists, farmers and forest owners); • People who practise nature tourism. Where possible, theoretical and practical content should be adapted to the local context in which the activities are carried out when developing the plan. The content and style guide are approved at ministerial level.
A	Supervisory authority	
S	ANEPC, GNR, ICNF, I. P.	
C		
I	Entire system	
F		
Aa		

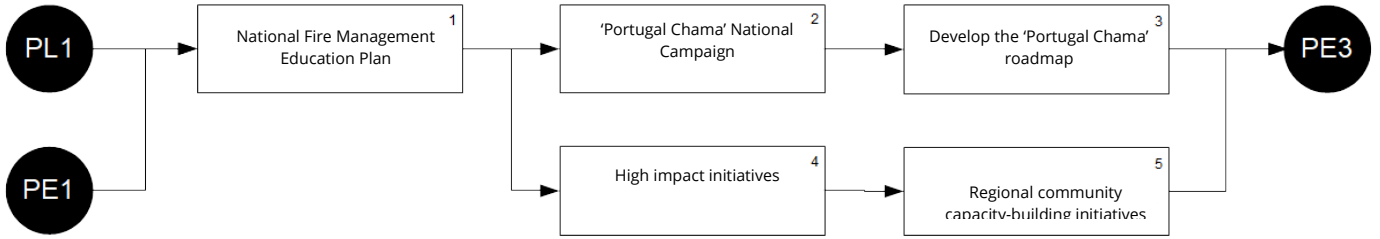
[2] 'Portugal Chama' National Campaign		CE: AGIF, I. P.
R	AGIF, I. P.	Develop a national mobilisation campaign to encourage action, creating ambassadors of change with national impact. With the endorsement of the Portuguese Republic, this process includes the following initiatives:
A	Supervisory authority	
S	ANEPC, GNR, ICNF, I. P.	

C **I** **F** **Aa**	Entire system	• Holding brainstorming sessions with all entities involved in the NPIRFM to perform a SWOT analysis of the communication initiatives and to identify challenges and joint opportunities for communication and solutions. • Defining a strategic concept to be developed and initiatives to be carried out in the year, including the respective budget and analysis with the entities involved. • Holding bimonthly meetings with the Ministries to obtain feedback and present results, and to determine communication opportunities which, at the time, could enhance initiatives already underway; • Holding meetings with the government to obtain feedback and present results.

[3] Develop the 'Portugal Chama' roadmap		**CE: AGIF, I. P.**
R	AGIF, I. P.	According to the strategic guidelines for the campaign [2], a roadmap should be created for dissemination of the 'Portugal Chama' campaign at regional, sub-regional and local levels that includes an understanding of its link to the process of investigating the causes (((PE1)), aimed at: • Ensuring the consistency of the 'Portugal Chama' campaign at the different levels of territorial intervention; •Sharing good practices for rural fire prevention and preparedness (self-protection and safety measures) within the framework of fire management; • Communicating and disseminating good fire management practices using success stories; • Encouraging the finding and sharing of customised solutions (social, economic and landscape adjustment); • Diversifying the channels of dissemination, adjusting them to the type of content and target audience; • Promoting the sharing of applied scientific knowledge as a basis for improving fire management; • Promoting the sharing and dissemination of knowledge among all stakeholders and actors in the system.
A	Supervisory authority	
S	CNGIFR, CRGIFR, CSGIFR, CMGIFR, CGE, LGE, PRV, ORE, CB, CC	
C **I** **F** **Aa**	Entire system	

[4] High impact initiatives		**CE: AGIF, I. P.**
R	AGIF, I. P.	High impact initiatives are designed to share information and record good practices, thereby improving knowledge of the territory and of the good practices. With the endorsement of the Portuguese Republic, these include: • The systematic sharing of knowledge, formation of public opinion, and debate of the major challenges and responses for the country. • Reports: testimonials, good practices, local voices, people, professionals, aspirations; • Document formats. The content and style guide are approved at ministerial level.
A	Supervisory authority	
S	ANEPC, GNR, ICNF, I. P., CB	
C **I** **F** **Aa**	Entire system	

[5] Regional community capacity-building initiatives		CE: AGIF, I. P.
R	ANEPC, ICNF, I. P.	Ensure the collaboration and synergies needed to train and equip communities with knowledge on fire management and the tools and skills they need to help improve their quality of life and preparedness for protection against rural fires.
A		
S	CM, CIM, MA, CB, FPO, PRV, ORE	Develop and implement a regional community capacity-building programme taking the following into account: • Define a network of priority communities; • Carry out a detailed analysis of the causes linked to the local fire history and determine the 'why' behind those causes; • Adjust the capacity-building strategy by developing training initiatives tailored to the local reality; • Equip communities with their own fire protection resources (prepared and equipped local teams); • Integrate all initiatives to enhance other already existing initiatives, such as the Safe Villages, Safe People Programme. • Engage the community collaboratively in local planning processes for intervention in the territory at landscape level and in local fire management and restoration processes; • Holistic intervention to improve social, economic and environmental conditions.
C		
I		
F		
Aa		



Flow chart PR1. Education and integrated communication

PR2
RISK COMMUNICATION

Risk communication must be based on the implementation of activities over time, ensuring a coherent, transparent, consistent and reliable channel of communication for the transmission of information to the population, and that helps change behaviours with regard to the rural fire hazard.

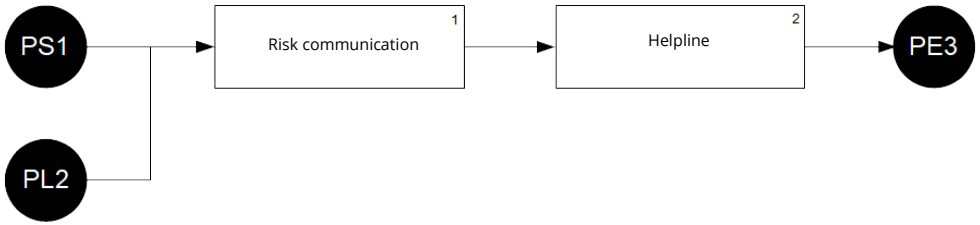
Communication processes must be adjusted to the different target audiences for a better perception of the risk and, consequently, implementing self-protection measures appropriate to the rural fire hazard.

The transmission of information must be centralised, disseminated across the entire system and flow throughout the process chain.

[1] Risk communication		CE: ANEPC
R	ANEPC	Rural fire hazard information is decisive when making decisions about risk mitigation and preparedness measures.
A		
S	ICNF, I. P., GNR, CGE, LGE	The efficiency and effectiveness of such communication implies that rural fire hazard warnings include:
C		• Designing communications for specific target groups;
I	Entire system	• Using tools that disseminate information as quickly and efficiently as possible, such as helplines.
F		Digital platforms are also a promising option to improve dissemination of information.
Aa		

[2] Helpline		CE: ANEPC
R	ANEPC	The helpline is activated whenever a rural fire hazard ((PS1)) is deemed to pose an unacceptable risk to the people.
A		
S	GNR, ICNF, I. P.	Information provided must be standardised according to operational guidelines ((PL2)) and clearly and unequivocally explain:
C		• The situation that triggered the information;
I	Entire system	• The time interval and geographical area;

F **Aa**		• Measures that can help mitigate the impact of the fire and that can be implemented by the general public; • Other information that can help minimise the harmful effects. The helpline number, when activated, must be included in the information provided to the general public. Call transfer to emergency numbers must be ensured. Operating procedures and protocols between supporting entities for providing assistance via the helpline must ensure that calls are transferred to emergency numbers and provide technical and specialised support for the type of emergency, ensured individually by the relevant entities.



Flow chart PR2. Risk communication

PV1

RURAL LAND MANAGEMENT

Initiatives that prepare the territory for fires, such as fuel management, protection systems, new landscapes and development practices.

[1] Prepare initiative according to annual plan		CE: ICNF, I. P.
R	ICNF, I. P.	When preparing initiatives, the interventions must be prioritised taking into account the proposals for implementation at municipal level and the defined PAPS. Interventions on plots implies a clear definition of targets, techniques and frequency of treatments to ensure results are achieved.
A	Supervisory authority	
S	CGE, LGE, PRV	
C	ANEPC	
I	CC	
F		
Aa	AGIF, I. P.	

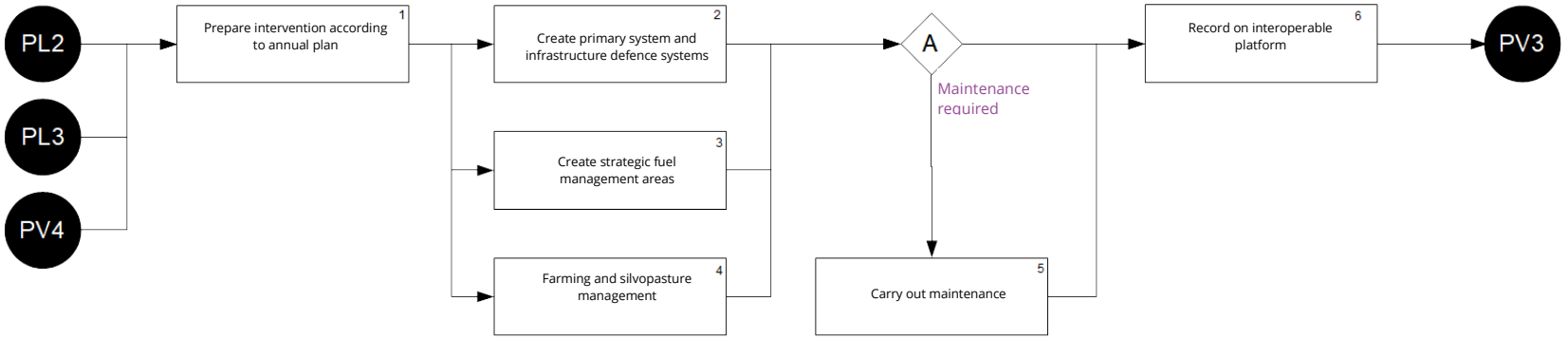
[2] Create primary system and infrastructure protection systems		CE: ICNF, I. P.
R	ICNF, I. P.	The primary system is a fuel management infrastructure that is established in the rural territory that contributes to the division of forest land and provides support in suppression operations, creating conditions conducive to fire suppression in strategic locations. The primary system is defined in the RAP and must be integrated in the SRAPs and MIPs, with a 10-year implementation and maintenance schedule. It is this 10-year period that the budget must cover and the procurement of resources must take place. As the implementation of this infrastructure is mandatory, it must be designed beforehand and, because it occupies private land, it must be declared a public utility before it can be implemented. This process also includes fuel management of the road and railway networks, of transport lines and of power lines that are part of the secondary fuel management system.
A		
S	LGE, GNR, ANEPC, FFAA, CB, PRV	
C	ANEPC	
I	CC	
F	GNR	
Aa	AGIF, I. P.	

[3] Create strategic fuel management areas		CE: ICNF, I. P.
R	ICNF, I. P.	Rural land management involves the implementation of strategic fuel management areas to minimise the impact and size of rural fires by carrying out fuel management in strategic locations to limit the behaviour and spread of a fire in the landscape and minimise the impacts thereof. The location and size of strategic fuel management areas are defined in the SRAPs and must be included in the MIPs.
A		
S	LGE, GNR, ANEPC, FFAA, CB, PRV	
C	ANEPC	
I	CC	
F	GNR	
Aa	AGIF, I. P.	

[4] Farming and silvopasture management		CE: ICNF, I. P.
R	ICNF, I. P.	Landscape interventions aimed at diversifying the agroforestry mosaic should maximise the sustainable development of agricultural activity in strategic locations with a view to minimising the impact and size of rural fires. The creation of improved pastures and agricultural areas alongside forests, in strategic areas, should be seen as structuring activities, the maintenance of which must be ensured as it is essential for preparing rural land for fires.
A		
S	DRA, DGAV, LGE, PRV, CC	
C		
I	ANEPC, PRV, CC	
F		
Aa	AGIF, I. P.	

[5] Carry out maintenance		CE: ICNF, I. P.
R	ICNF, I. P.	If necessary, carry out maintenance initiatives and update the respective plan <A>. This implies that [2], [3] and [4] have been carried out beforehand and the respective maintenance responsibility has been assigned.
A		
S	LGE, GNR, ANEPC, FFAA, CB, PRV	
C	ANEPC	
I	CC	
F	GNR	
Aa	AGIF, I. P.	

[6] Record on interoperable rural fire management platform		CE: AGIF, I. P.
R	ICNF, I. P.	All information on the creation and maintenance of the primary system, strategic fuel management and farming and silvopasture management is recorded. Once this has been completed, the process for checking safety conditions ((PV3)) can commence.
A		
S	LGE, GNR, ANEPC, FFAA, PRV	
C		
I	Entire system	
F		
Aa	AGIF, I. P.	



Flow chart PV1. Rural land management

PV2
PROTECT BUILDINGS

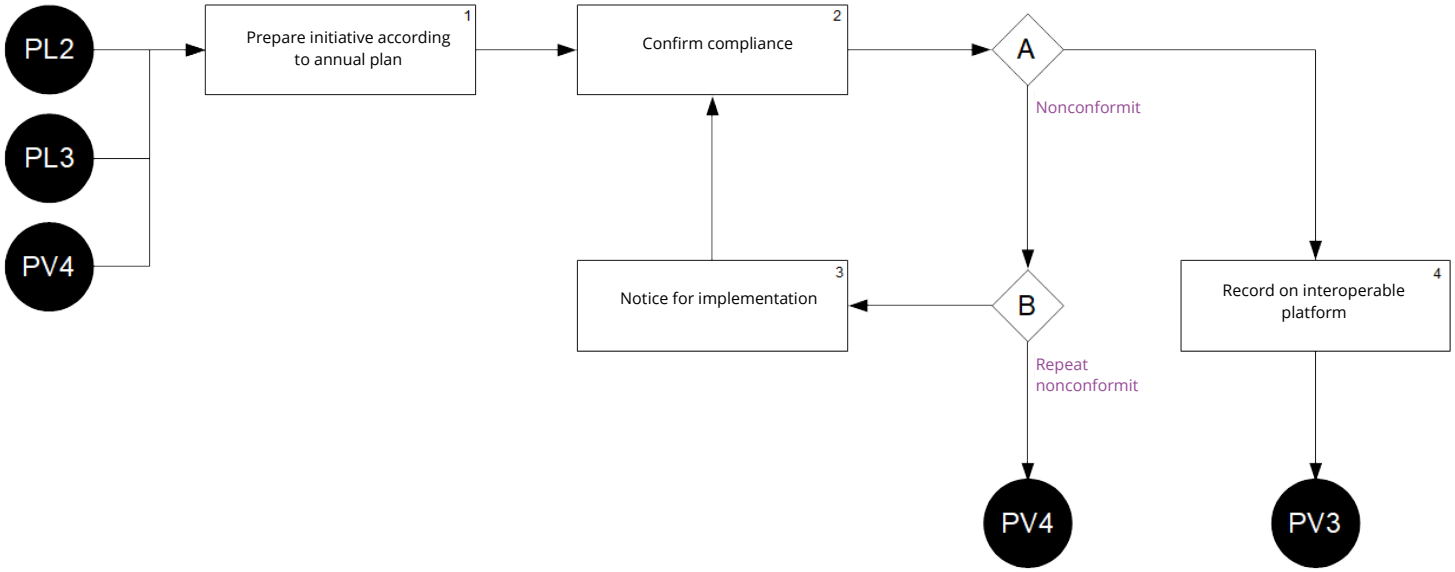
Create and maintain good practices for the protection of buildings. Identify and prioritise interventions in the urban-rural interface to create territories that promote rural fire protection focusing on the development and use of interface areas and preparing buildings. Conditions should be created to minimise the likelihood of fire ignitions and the spread of fire in these areas, which should also be better protected against the outbreak of fires in forest lands and reduce the likelihood of them affecting the users thereof.

[1] Prepare initiative according to annual plan		**CE: ANEPC**
R	ANEPC	When preparing initiatives, the interventions must be prioritised taking into account the proposals for implementation at municipal level and the defined PAPS. Initiatives to protect buildings must include: • The conservation and maintenance of buildings; • Fuel management in the urban-rural interface; • Conversion of the urban-rural interface to compatible uses; • Preparation of buildings; • Assessment of the effectiveness of shelters, places of refuge and evacuation routes; • The design and testing of safety procedures.
A		
S	LGE, PRV	
C		
I		
F		
Aa	AGIF, I. P.	

[2] Confirm compliance		**CE: ANEPC**
R	CM	Evaluation of the implementation of the infinitives carried out in [1], focusing particularly on the type of construction materials exposed, to be promoted or avoided, in buildings, the characteristics of the surrounding area, fire protection systems, and the existence of a safe place for people to assemble.
A		
S	CB, ANEPC, GNR, PSP	
C		
I	ANEPC	
F	GNR	
Aa		

[3] Notice for implementation		CE: ANEPC
R	CM, GNR	Should the requirements set forth in applicable legislation <A> not be met, the landowner and/or responsible entity must be notified such that [1] is implemented. Should non-compliance [B] continue following notice of non-compliance with the implementation of initiatives for preparing buildings and fire management in the urban-rural interface, according to prevailing laws and recommendations, the inspection process ((PV4)) will be triggered.
A		
S	AT	
C		
I		
F		
Aa		

[4] Record on interoperable rural fire management platform		CE: AGIF, I. P.
R	CM, GNR	After interventions have been carried out in the urban-rural interface to create territories that promote rural fire protection, the initiatives are recorded on the interoperable rural fire management platform, which then triggers the process for checking safety conditions ((PV3)).
A		
S	PRV	
C		
I	Entire system	
F		
Aa	AGIF, I. P.	



Flow chart PV2. Protect buildings

PV3

CHECK SAFETY CONDITIONS

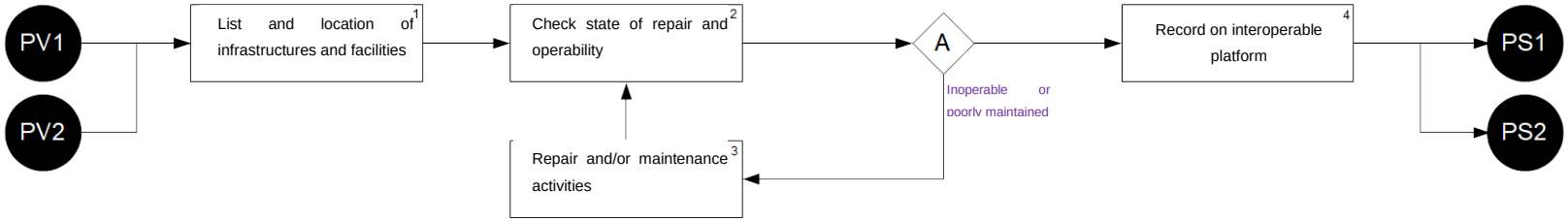
Ensure operability by checking the state of repair and operation of protection and suppression structures and equipment on the ground, in particular those of the protection systems, warning and alert mechanisms, shelters, places of refuge and evacuation routes established in safety plans and check suppression equipment.

[1] List and location of infrastructures and facilities			CE: AGIF, I. P.
R	ANEPC, ICNF, I. P., GNR	Update the list and characterisation of the infrastructures that make up the protection systems, namely: • Water points network; • Forest road network; • Fire detection and surveillance network. Update the list of the shelters and places of refuge, evacuation routes, pumping units, logistics support bases and other fire suppression infrastructures.	
A			
S	LGE, CB, PRV		
C			
I			
F			
Aa	AGIF, I. P.		

[2] Check state of repair and operability			CE: ANEPC
R	ANEPC, ICNF, I. P.	Check the operability of the infrastructures that make up the protection systems. Test and assess alert and warning mechanisms and evacuation procedures. Test Civil Protection Emergency plans. Test and assess the protection and defence equipment of buildings. Should the systems not be operating correctly or if infrastructure maintenance is needed [A], the necessary initiatives to ensure operability must be triggered. Once recorded on the interoperable rural fire management platform, this process kicks off the pre-suppression stage ((PS1)) and ((PS2)).	
A			
S	LGE, CB, GNR, PRV		
C			
I			
F			
Aa	AGIF, I. P.		

[3] Maintenance and/or repair activities		CE: ANEPC
R	CM	Where, on the ground, the state of repair and operation of protection system structures and protection and suppression equipment is not in conformity with the law, the initiatives required to ensure operability as quickly as possible must be implemented.
A		
S	LGE, CGE, GNR, CB, PRV	
C		
I		
F		
Aa	AGIF, I. P.	

[4] Record on interoperable rural fire management platform		CE: ANEPC
R	ANEPC, ICNF, I. P.	No matter the level of operability or state of repair, infrastructures and equipment must be recorded on the interoperable fire management platform, ensuring that the information of the level of operability can be used to inform decisions.
A		
S	LGE, CGE, GNR, PRV	
C		
I	Entire system	
F		
Aa	AGIF, I. P.	



Flow chart PV3. Assess safety conditions

PV4
INSPECTION

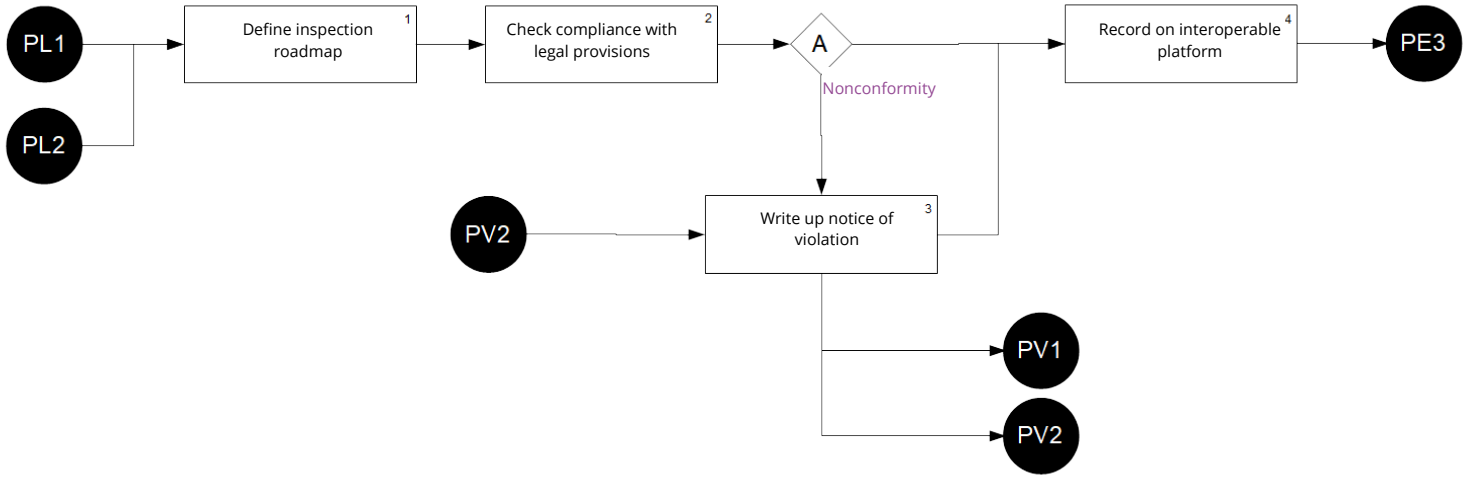
Inspection of compliance with legal provisions on land management and rural fire protection, and flag any nonconformities, with the necessary georeferencing, on the interoperable rural fire management platform

[1] Define inspection roadmap		CE: GNR
R	GNR	Rural land management and building protection initiatives are implemented based on planning ((PL1)) and operational guidelines ((PL2)). In addition to the various regulations and legal provisions, obligations regarding the protection of buildings and other facilities must also be taken into account, which will also be inspected by the competent authorities. Each inspection authority is responsible for designing their own internal inspection roadmap, based on the priorities identified on the ground and following a checklist of regulations, the compliance with which must be confirmed. Supporting entities must inform the inspection authority of the areas where intervention standards require inspection.
A		
S	LGE, PSP	
C	ANEPC, ICNF, I. P., CM	
I		
F		
Aa	AGIF, I. P.	

[2] Check compliance with legal provisions		CE: GNR
R	GNR, PSP, CM, ICNF, I. P., ANEPC	Once the roadmap [1] has been defined, the inspection authorities carry out inspection of compliance with the respective legal provisions, writing up notices of violation when they identify nonconformities. Where necessary, ownership is determined in collaboration with the AT and by checking cadastral information on the BUPi centralised property platform.
A		
S	AT; SGMJ	
C		
I		
F		
Aa		

[3] Write up notice of violation		CE: GNR
R	GNR, PSP, CM, ICNF, I. P., ANEPC	A notice of violation is written up if a nonconformity is identified <A> during an inspection. Notices of violation also serve as a means to notify landowners and/or managers to correct the respective nonconformity. The nonconformity and the respective notice of violation are recorded on the interoperable rural fire management platform, as indicated in [4].
A		
S	AT; SGMJ	
C		
I		
F		
Aa		

[4] Record on interoperable rural fire management platform		CE: AGIF, I. P.
R	GNR	Notices of violation and the correction of nonconformities are recorded on the interoperable rural fire management platform. This information can be accessed by IRFMS agents, in compliance with data protection laws.
A		
S	PSP, CM, ICNF, I. P., ANEPC	
C	Entire system	
I		
F	AGIF, I. P.	
Aa		



Flow chart PV4. Inspection

PS1
RISK ASSESSMENT

Analyse of the parameters that determine an increase in response capacity and information to the population; Information resulting from this analysis must be provided by personnel who are capable of taking each of the variables into account to determine the fire risk and potential consequences thereof.

[1] Receive and interpret operating parameter constraints		CE: ANEPC
R	ANEPC	Information on the operational state-of-play, such as the number of ongoing incidents, number of resources available, current engagement, and other relevant operational information that can impact on the risk analysis performed in [3].
A		
S	ICNF, I. P., CB, FFAA, GNR	
C		
I		
F		
Aa	AGIF, I. P.	

[2] Provide weather information		CE: IPMA
R	IPMA, I. P.	Standing provision of weather reports and forecasts for a 3-day period, weekly, monthly and seasonal forecasts and official weather warnings. Daily briefings and direct contact to support decision-making on specific events. The information provided must be current and meet content criteria, defined before a campaign begins and reviewed at least once a year, together with the national weather service and the other actors involved.
A		
S		
C		
I	ANEPC, ICNF, I. P.	
F		
Aa	AGIF, I. P.	

[3] Risk assessment		CE: ANEPC
R	ANEPC	Performed by a decision support unit that combines weather information [2], information on fuel load, fire hazard information, operational information [1], the vulnerability of potentially affected areas and people, and other information related to the risk. Risk assessment can trigger the activation of emergency plans <A> under process ((SC5)).
A		
S	ICNF, I. P., IPMA, I. P., ORE	
C		
I	Entire system	
F		
Aa	AGIF, I. P.	

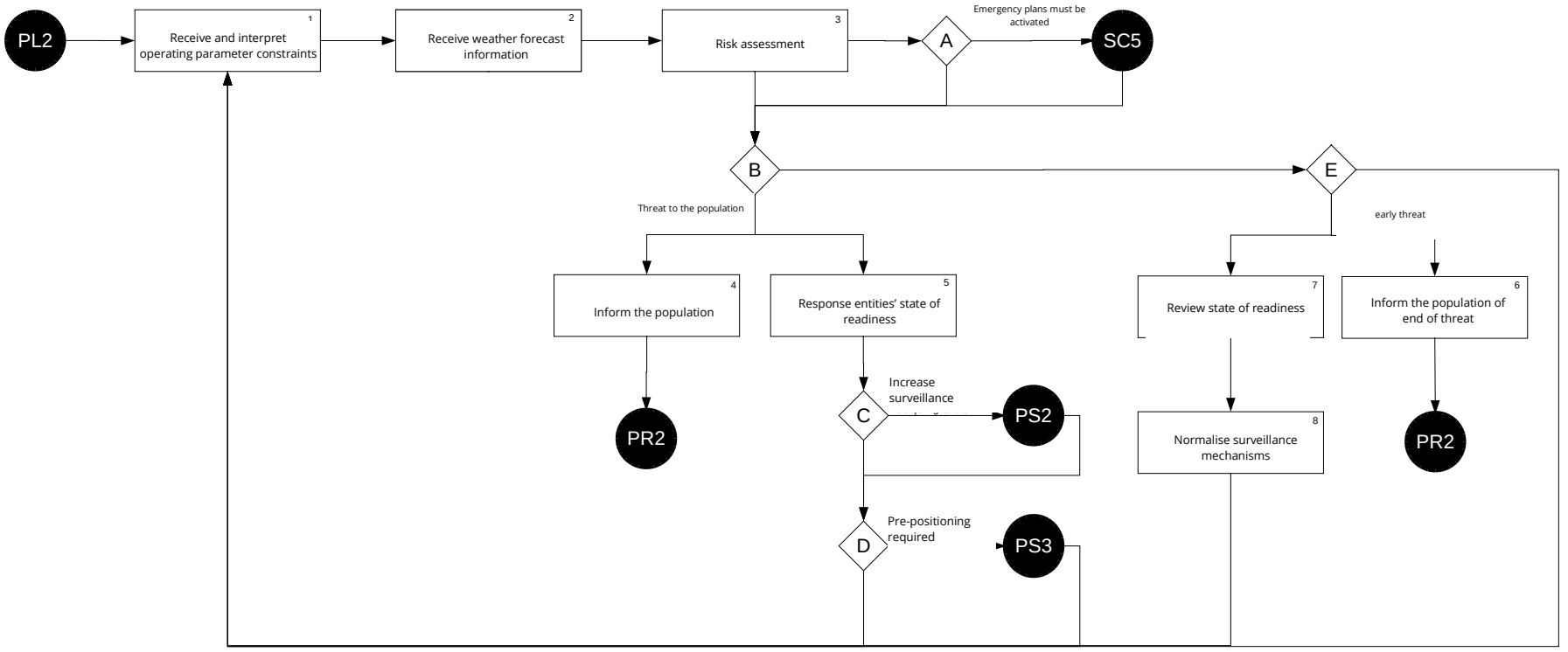
[4] Inform the population		CE: ANEPC
R	ANEPC, CM	Where the legally competent authorities deem necessary, as a result of the risk assessment <B>, information must be disseminated among the people in accordance with the risk communication processes ((PR2)).
A		
S	ICNF, I. P., LGE, CGE, PRV	
C		
I	Entire system	
F		
Aa	AGIF, I. P.	

[5] Response entities' state of readiness		CE: ANEPC
R	ANEPC	When a population is at risk <B> or personal or environmental assets are threatened, the need to dispatch personnel and resources to respond to a possible emergency must be assessed: • Increasing surveillance <C> in more sensitive areas, described in the surveillance process ((PS2)); • Pre-positioning resources in areas of greater risk <D>, described in the pre-positioning process ((PS3))
A		
S	LGE, CB, FFAA, GNR, ICNF, I. P., PRV	
C		
I	Entire system	
F		
Aa	AGIF, I. P.	

[6] Inform the population of end of threat		CE: ANEPC
R	ANEPC	Once the risk has passed <E>, the population must be informed of the end of the threat. If coinciding with the re-establishment of safety conditions ((SC4)), such information should be added for more efficient and targeted communication with the public. Public notification of the end of the threat implies deactivating the helplines that were opened during the risk communication process ((PR2)).
A		
S	ICNF, I. P., LGE, CGE, PRV	
C		
I	Entire system	
F		
Aa	AGIF, I. P.	

[7] Review state of readiness		CE: ANEPC
R	ANEPC	Once the risk has passed <E>, the need to maintain an increased presence of personnel and resources on the ground is assessed. This assessment must take personnel management and crew rest times into account.
A		
S	LGE, CB, FFAA, GNR, ICNF, I. P., PRV	
C		
I	Entire system	
F		
Aa	AGIF, I. P.	

[8] Normalise surveillance mechanisms		CE: ANEPC
R	GNR	Once the risk has passed <E>, the need to maintain an increased presence of personnel and resources on the ground is assessed. Surveillance will continue to be carried out with the personnel and resources pre-determined in operational guidelines ((PL2)).
A		
S	LGE, CB, FFAA, GNR, ICNF, I. P., PRV	
C		
I	Entire system	
F		
Aa	AGIF, I. P.	



Flow chart PS1. Risk assessment

PS2
SURVEILLANCE

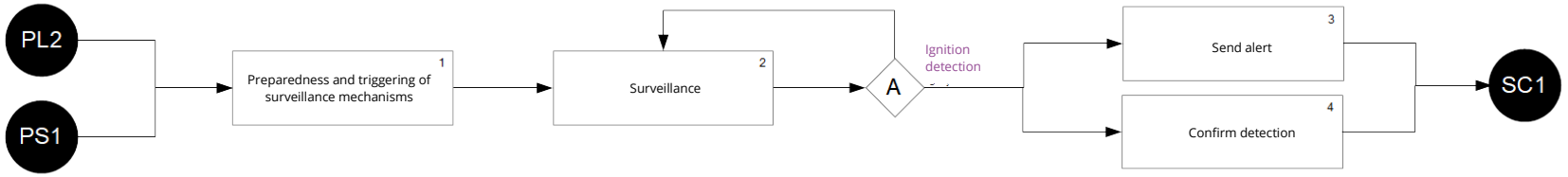
Surveillance operations across the national territory to reduce rural fire detection and response times. Define critical surveillance areas and hot spots, ensuring adequate deployment of surveillance personnel, ground and aerial support crews and security forces and coordination between all people involved and the entity responsible for surveillance. Monitoring and evaluation of surveillance initiatives to increase the effectiveness of the activities and the commitment of resources.

[1] Preparedness and triggering of surveillance mechanisms		CE: GNR
R	GNR	Surveillance initiatives are the direct result of the operational directives ((PL2)) which stipulate the periods for commitment to surveillance initiatives based on the fire risk, event history and areas of interest, no matter the time of year, establishing the modus operandi, cooperation and coordination, communications, logistics and information management. Additional resources are dispatched when the risk assessment ((PS1)) so determines to mitigate the fire risk.
A	ANEPC, ICNF, I. P.	
S	LGE, CB, FFAA, PRV	
C		
I	Entire system	
F		
Aa	AGIF, I. P.	

[2] Surveillance		CE: GNR
R	GNR	Surveillance initiatives include those carried out as part of the National Lookout Tower Network and patrols and reconnaissance of the forest road network, isolated villages or buildings, water points and other general close proximity policing activities to curtail risk behaviour.
A		
S	ANEPC, ICNF, I. P., LGE, CB, FFAA, PRV	
C		
I	Entire system	
F		
Aa		

[3] Send alert		CE: GNR
R	GNR	Should an ignition be detected <A> it must be reported immediately so that the first response teams described in the initial attack process ((SC1)) can be dispatched.
A		
S	ANEPC, ICNF, I. P., LGE, CB, FFAA, PRV	It is up to ANEPC to dispatch response teams when it receives alerts from any existing sources, triggering the initial attack process ((SC1)).
C		
I	ANEPC, ICNF, I. P.	
F		
Aa		

[4] Confirm detection		CE: GNR
R	GNR	Confirm the fire warning such that the first response teams can be dispatched, minimising the sending of resources to respond to a false alert.
A		It is up to ANEPC to dispatch response teams when it receives alerts from any existing sources, triggering the initial attack process ((SC1)).
S	ANEPC, ICNF, I. P., LGE, CB, FFAA, PRV	
C		
I	ANEPC, ICNF, I. P.	
F		
Aa		



Flow chart PS. Surveillance

PS3

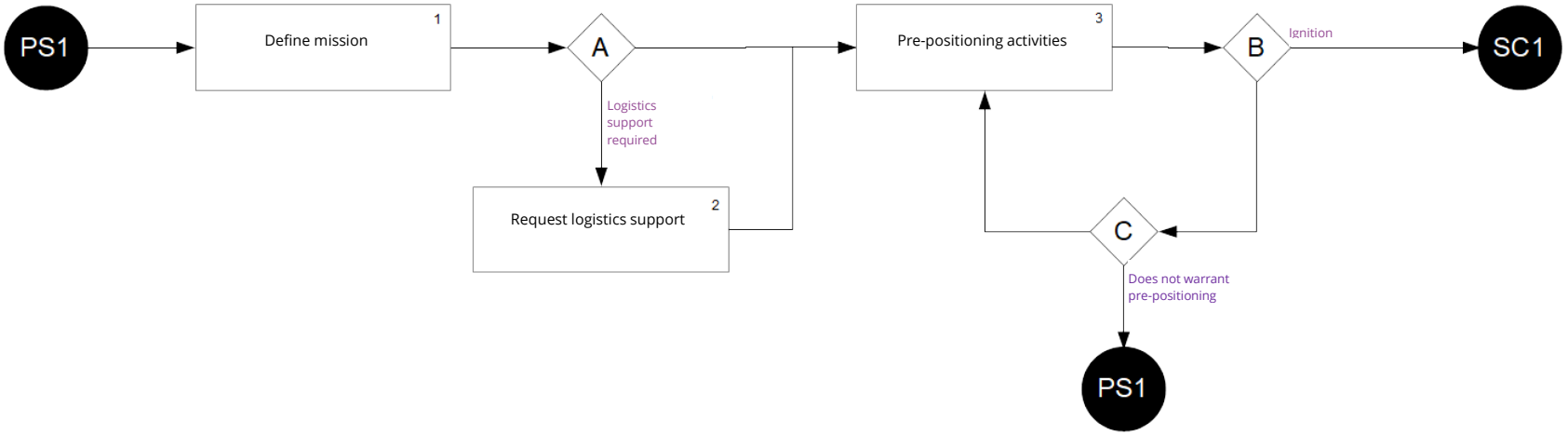
PRE-POSITIONING

Pre-position resources in both action pillars: rural fire management and rural fire protection. Define strategic staging locations based on the fire risk, existing assets, history of rural fires and events with activities that promote risk behaviour. The use of georeferenced ground and aerial support resources committed to pre-positioning activities must ensure IA capacity, coordinated by ANEPC, ensuring the monitoring and evaluation of pre-positioning initiatives.

[1] Define mission		CE: ANEPC
R	ANEPC, ICNF, I. P.	The mission should be defined based on the fire risk and priority areas for the pre-positioning of resources at national and regional level, also including aerial support resources, allocating more resources where the risk is greater or where there is a higher number of ignitions within a short period of time.
A		
S		
C		
I		
F		
Aa	AGIF, I. P.	

[2] Request logistics support		CE: ANEPC
R	ANEPC, ICNF, I. P.	After a request has been made for deployment and the mission assigned, an assessment must be made whether all logistics conditions <A> are in place to support the carrying out of the assigned mission. If logistics support conditions are not in place, they must be requested as soon as possible.
A		
S	LGE, CB, FFAA, AF, GNR, PRV	
C		
I		
F		
Aa		

[3] Pre-positioning activities		CE: ANEPC
R	ANEPC, ICNF, I. P.	After deployment, define the main mission and additional missions for the pre-positioning initiatives using the Firefighter Corps (CB), Special Civil Protection Unit (FEPC), Emergency Protection and Relief Unit (UEPS), Forester-Firefighter Crews (ESF), National Forest Agents Corps (CNAF), Forest-Firefighter Brigade (BSF), Municipal Forest Fire Teams (EMIF) and other entities based on the fire risk, existing assets, history of major rural fires, cause of the fires and proximity to buildings with risk activities. Should an ignition be detected <B>, dispatched resources will become first response teams, who will begin the initial attack process ((SC1)). These initiatives must be re-evaluated based on the risk ((PS1)) and forces dispatched or recalled <C> as needed.
A		
S	LGE, CB, FFAA, AF, GNR, PRV	
C		
I		
F		
Aa	AGIF, I. P.	



Flow chart PS3. Pre-positioning

SC1

INITIAL ATTACK

An initial attack is the first organised intervention by response teams, aimed at quickly arriving on scene and with the most efficient resources to protect people and property in urban areas and to manage fire on rural land. The resources of different entities are used in an initial attack so as to not exhaust the response capacity of an individual entity and are commanded by suitably qualified elements. ANEPC is primary responsible for this process as operations are carried out under the command and control doctrine of the Integrated Protection and Relief Operations System, overseen by ANEPC. However, in several processes responsibility for implementation is shared with ICNF, I.P. as this is the entity responsible for managing the specialised intervention on rural land.

[1] Dispatch local resources		CE: ANEPC
R	ANEPC	Receiving an alert ((PS2)) triggers the dispatch of local resources, corresponding to the deployable response teams.
A		
S	CB, GNR, ANEPC, ICNF, I. P. LGE, PRV	Dispatching local resources according to the applicable operational guidelines ((PL2)) includes recording all alert information on a computer system, which automatically recommends response teams if an advance intervention plan is in place, and allows the system operator to select other resources based on the type of event and resources available.
C		
I		
F		
Aa		

[2] Assign ground crews their mission		CE: ANEPC
R	ANEPC	A mission is assigned to ground crews, triangulating entities as planned beforehand, to ensure response capacity for new initial attacks. Assigning a mission to each response team takes into account their primary intervention, whether rural fire management or rural fire protection.
A		
S	CB, GNR, ANEPC, ICNF, I. P. LGE, PRV	
C		
I		
F		
Aa		

[3] Assign aerial support crews their mission		CE: ANEPC
R	ANEPC	A mission is assigned to aerial support crews according to the applicable operational guidelines ((PL2)), respecting dispatch times and criteria for the operation of aircraft, such as property at risk, intervention priorities, expected flying and operation hours, amongst other criteria. The mission is assigned directly to the aircraft pilot, and the aircraft management entity duly informed. Assigning a mission to each response team takes into account their primary intervention, whether rural fire management or rural fire protection. The intervention of aerial support resources in an initial attack includes taking photographs upon arrival at the scene to help assess the potential fire, which are sent in real-time to the analysis unit.
A		
S	FFAA (AF), GNR, PRV	
C		
I		
F		
Aa		

[4] Fire suppression		CE: ANEPC
R	ANEPC	The fire suppression process might not be triggered in the event of a false alarm or false alert, in which case the dispatched resources will return to base. Fire suppression initiatives are carried out with resources on site, assessing the conditions and environment under which operations are carried out (expected spread, property at risk, property to be protected, topography, safety conditions, access and escape routes, current and predicted weather and other factors). The Relief Operations Commander (ROC) designs the strategy for the engagement of the resources they have available, which may include, among other things, the use of suppression fire, heavy machinery or direct fire suppression using water and other extinguishing agents. The strategy defined by the ROC has clear goals both for rural fire management and rural fire protection. When there is no active flame <H>, the Mop-up and Extinguishment ((SC3)) and Investigation of Causes ((PE1)) processes are triggered. When the complexity of the operation and/or the number of resources to management so requires <C>, or if the time allotted for initial attack, according to the applicable operational guidelines ((PL2)) runs out <D>, an extended attack ((SC2)) commences, with reinforcement of management, command and control capabilities.
A		
S	CB, GNR, ANEPC, ICNF, I. P. LGE, PRV	
C		
I		
F		
Aa		

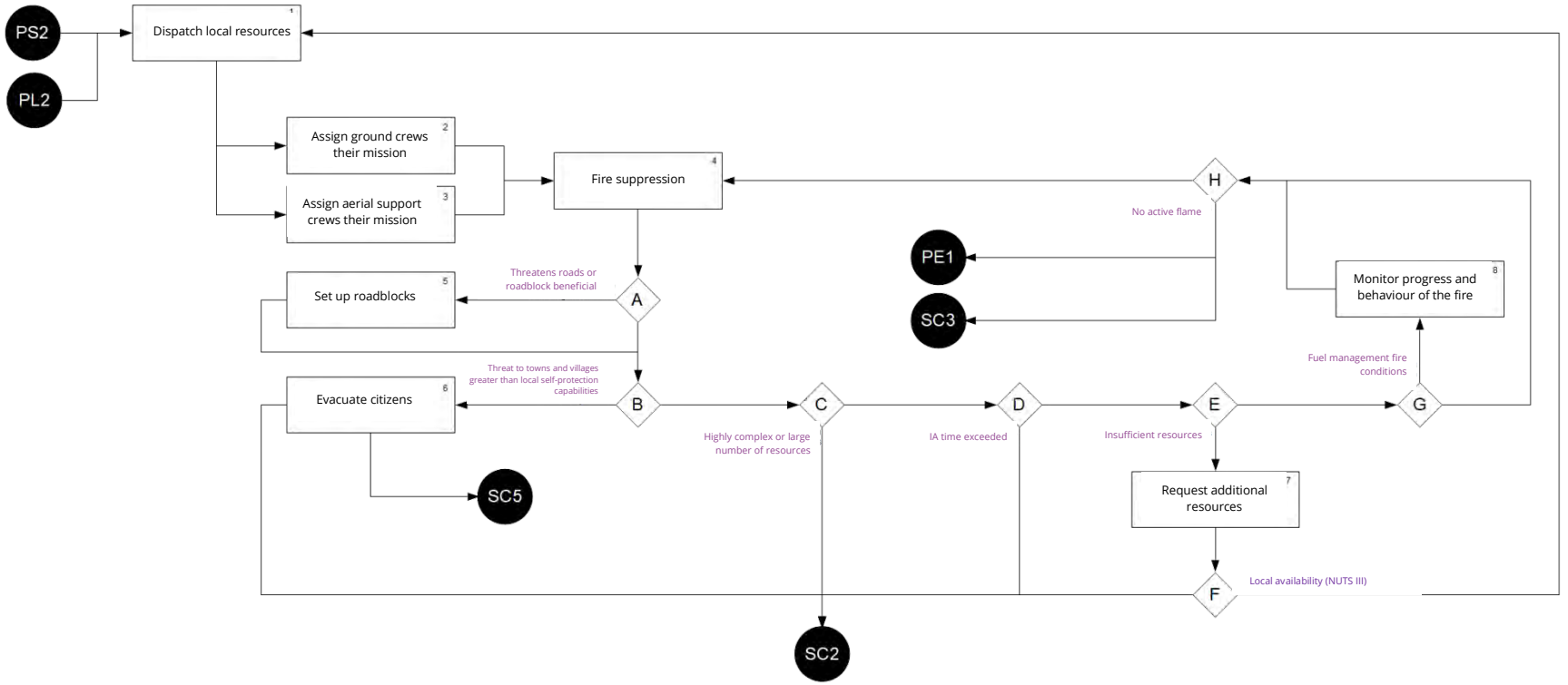
		Progressing to an extended attack based on the time that has passed since the start of fire suppression operations is a pre-emptive initiative in preparation for further response. All agents involved in the operation are informed of progression to an extended attack.

[5] Set up roadblocks		**CE: ANEPC**
R	GNR, PSP	When roads are threatened or it is operationally beneficial to interrupt traffic, the ROC requests security forces to set up roadblocks, who will then inform the ROC when they have been put in place.
A		
S	LGE, PRV	If railways are threatened, or if operationally required, the ROC requests the managing entity to stop rail vehicle movements via the operations and emergency management office.
C		
I	Entire system	If the flow of traffic is not immediately halted, the ROC will be given an estimated time for implementation.
F		
Aa		Roadblocks and the stopping of rail vehicle movements are recorded on the interoperable rural fire management platform clearly indicating when they were requested, when they were put in place, why they were required and the related events, if applicable.

[6] Evacuate towns and villages		**CE: ANEPC**
R	GNR, PSP	When the threat exceeds a population's self-protection capabilities, the ROC requests security forces to evacuate towns and villages.
A		
S	CB, LGE, PRV	The ROC is informed of the start and end of the evacuation, the number of citizens evacuated and the location to where they were evacuated such that they can record the information on the operations management platform, including when and why evacuation was requested and the related events, if applicable.
C		
I	Entire system	The procedures established under the 'Safe Villages' programme are triggered during the evacuation process, when applicable.
F		
Aa		Local authorities provide the necessary logistics support during the operation for the temporary shelter of evacuated citizens. Evacuating towns and villages indicates the need for an extended attack ((SC2)).

[7] Request additional resources		CE: ANEPC
R	ANEPC	If there are not enough resources on site to suppress the fire <E>, the ROC requests additional resources from the operations and emergency management office. If the resources requested by the ROC are available <F>, the operations and emergency management office dispatches them as described in [1]. If the resources requested by the ROC are not unavailable and need to be requested up the chain, operations progress to an extended attack ((SC2)) and all agents involved are informed to that effect.
A		
S	CB, GNR, ANEPC, ICNF, I. P. LGE, PRV	
C		
I		
F		
Aa		

[8] Monitor the progress and behaviour of the fire		CE: ANEPC
R	ANEPC	If a fire can be considered a 'fuel management fire' <G>, the ROC communicates the classification thereof and adjusts resources for monitoring the progression and behaviour of the fire, ensuring that it is contained within the pre-defined area, as indicated in the planning document.
A		
S	CB, GNR, ANEPC, ICNF, I. P., AGIF, I. P. LGE, PRV	
C		
I		
F		
Aa		



Flow chart SC1. Initial attack

SC2

EXTENDED ATTACK

An extended attack takes place after the initial attack and involves increasing the number of response teams and reinforcing command and control capabilities, according to the technical skills required to command the operation. An extended attack can begin at any moment, as determined by the ROC, or when the allocated time has elapsed, due to the complexity or when the number of resources have been exhausted, or based on what the ROC believes to be the expected growth of the fire.

Transfer command based on occurrence/commander profile		**CE: ANEPC**
R	ANEPC	When progressing from an initial attack to an extended attack, the chain of command changes by matching the ROC profile and that of their command post team to the characteristics of the occurrence. The previous ROC is relieved by an element (or entire command post team) whose profile is best suited to the development of the occurrence, irrespective of the originating entity and their position in the hierarchy.
A		
S	CB, ICNF, I. P.	
C		
I		
F		
Aa		

[2] Fire suppression		**CE: ANEPC**
R	ANEPC	Fire suppression initiatives are carried out with resources on site, assessing the conditions and environment under which the fire is expected to grow, such as expected spread, property at risk, property to be protected, topography, safety conditions, access and escape routes, current and predicted a weather and other factors. Based on these factors, the ROC designs a strategy for the engagement of the resources they have available, with clear goals for fire suppression, the opportunities to exploit and when this will take place. To this end, the ROC is assisted by the OCP units, primarily by the planning unit which studies and recommends solutions. The strategy, which underlies the Strategic Action Plan, is shared among all agents and focuses on the protection of people and property, fire management in rural spaces, the allocation of own resources and specific command for each sector.
A		
S	CB, GNR, ANEPC, ICNF, I. P., AGIF, I. P. LGE, PRV	
C		
I		
F		
Aa		

		If, as the operation progresses, the situation has been resolved in some sectors <I>, restoration initiatives can begin in those sectors thereby triggering process ((SC4)). If there is no active flame <N> in the entire affected area or in some sectors, the mop-up and extinguishment ((SC3)) and investigation of causes ((PE1)) processes are triggered.

[3] Set up Operational Command Post		**CE: ANEPC**
R	ANEPC	If the Operational Command Post (OCP) hasn't been set up <A>, the ROC orders it to be set up and requests the necessary resources for such purpose, if they aren't already available. The location selected for the OCP takes into account aspects such as the expected spread of the fire, view of the area, access routes, electricity and (tele)communications coverage, available space for expansion and the stationing of vehicles, and the safety distance from the fire and other local hazards, among other factors that the ROC and/or their command post team consider relevant.
A		
S	CB	
C		
I		
F		
Aa		

[4] Furnish OCP with command post team		**CE: ANEPC**
R	ANEPC	The various roles of the Operational Command Post are performed by specialised command post teams. These teams are made up of elements who are trained and specialise in each of the roles. Those who are part of these teams have comprehensive training and are able to take on various functions, with well-defined roles and without the need to first adapt. The people who are on these teams may be from different entities and hold different hierarchical positions. However, all that matters is their ability to perform the OCP role they are assigned.
A		
S	CB, GNR, ANEPC, ICNF, I. P., AGIF, I. P., INEM, I. P., FFAA, LGE, PRV	
C		
I		
F		
Aa		

[5] Convert to Joint Operational Command Post		**CE: ANEPC**
R	ANEPC	Liaison officers are called in from entities relevant to the operation, that is, those with operational personnel on the ground, with material and human resources on standby, affected or that can be affected by the fire, and other entities the ROC deems useful to successfully implement their Strategic Action Plan. These liaison officers will be integrated into the Joint Operational Command Post (JOCP) in a designated area, close to the ROC support units, particularly planning and logistics units, and are authorised by their respective originating entities to make decisions and are directly involved in decision-making to expedite the ROC's orders.
A		
S	CB, GNR, ANEPC, ICNF, I. P., AGIF, I. P., INEM, I. P., FFAA, LGE, PRV	
C		
I		

F		
Aa		

[6] Divide Theatre of Operations into sectors (RFM/RFP)		**CE: ANEPC**
R	ANEPC	If the theatre of operations has not been divided into sectors <B>, the sectors are defined (for rural fire management and rural fire protection based on specialised knowledge).
A		
S	CB, ICNF, I. P., GNR	
C		
I		
F		
Aa		

[7] Appoint sector commanders based on specialisation		**CE: ANEPC**
R	ANEPC	The command of each sector is given to elements with the appropriate profile who specialise in rural fire management (focusing on extinguishment on rural land) and rural fire protection (focusing on the protection of people and property). Training in the Operations Management System (SGO) is a requirement to be assigned command or in any other specialised area required for each situation. The people who are in command of the sectors may be from different entities and hold different hierarchical positions. However, all that matters is their ability to fulfil their role as command.
A		
S	CB, ICNF, I. P., GNR	
C		
I		
F		
Aa		

[8] Deploy resources based on specialisation		**CE: ANEPC**
R	ANEPC	After dividing the command post into sectors and assigning sector commanders, the ROC allocates the appropriate resources to each sector/commander according to their function, rural fire management and/or rural fire protection, so as not to concentrate resources haphazardly and inefficiently.
A		
S	CB, GNR, ANEPC, ICNF, I. P., AGIF, I. P., FFAA, LGE, PRV	
C		
I		
F		
Aa		

[9] Request logistics support		CE: ANEPC
R	ANEPC	If the ROC determines independently or based on information from the Logistics Officer that logistics support is needed <C>, they request it from the entities with response capacity.
A		
S	CB, FFAA, CGE, LGE, PRV	This capacity includes providing healthcare, food, hospital care, navigation and other capabilities, including, but not limited to, (tele)communications, power supply and decision-making computer systems.
C		
I		
F		
Aa		

[10] Set up roadblocks		CE: ANEPC
R	GNR, PSP	When roads are threatened or it is operationally beneficial to interrupt traffic, the ROC requests security forces to set up roadblocks, who will then inform the ROC when they have been put in place.
A		
S	LGE, PRV	If railways are threatened, or if operationally required, the ROC requests the managing entity to stop rail vehicle movements via the operations and emergency management office.
C		
I	Entire system	If the flow of traffic is not immediately halted, the ROC will be given an estimated time for implementation.
F		
Aa		Roadblocks and the stopping of rail vehicle movements are recorded on the interoperable rural fire management platform clearly indicating when they were requested, when they were put in place, why they were required and the related events, if applicable.

[11] Evacuate towns and villages		CE: ANEPC
R	GNR, PSP	When the threat exceeds a population's self-protection capabilities <E>, the ROC requests security forces to evacuate towns and villages.
A		
S	CB, LGE, PRV	The ROC is informed of the start and end of the evacuation, the number of citizens evacuated and the location to where they were evacuated such that they can record the information on the operations management platform, including when and why evacuation was requested and the related events, if applicable.
C		
I	Entire system	The procedures established under the 'Safe Villages' programme are triggered during the evacuation process, when applicable.
F		
Aa		Local authorities provide the necessary logistics support during the operation for the temporary shelter of evacuated citizens.

[12] Relieve OCP crews and operational personnel		CE: ANEPC
R	ANEPC	The Logistics Officer controls the working hours of operational personnel and of OCP officers, informing the ROC when these personnel and officers are reaching the limit of said working hours <F>, compromising their safety, the efficacy of manoeuvres and the quality of their decisions, who then immediately relieves these resources and/or requests the operations and emergency management office to send additional resources to relieve them. Elements who are relieved are sent to pre-established resting areas, to return to base once mentally and physically rested, or to manoeuvres, depending on the progression of suppression activities. OCP liaison officers must also be relieved in accordance with the procedures followed by the originating entity.
A		
S	CB, GNR, ANEPC, ICNF, I. P., AGIF, I. P., INEM, I. P., FFAA, LGE, PRV	
C		
I		
F		
Aa		

[13] Public statement by the Public Relations Officer		CE: ANEPC
R	ANEPC	At the time agreed with the media for the dissemination of information <G>, the Public Relations Officer will speak to the media to provide information on the progress of operations, the strategy and goals, including critical areas and behaviours to be adopted by the general public. Communication to the public at pre-determined intervals is important to manage expectations and to share information about what needs to be done. This is the Public Relations Officer's primary role and thus allows the ROC to focus on operations, although the ROC must also make a statement at the end of operations and may, when possible, make a public statement on key moments of the operation.
A		
S	AGIF, I. P., ICNF, I. P., GNR, INEM, I. P.	
C		
I	Entire system	
F		
Aa		

[14] Activate Public Warning System		CE: ANEPC
R	ANEPC, CM	If there is a recognised risk to people who are in close proximity to a fire or who are in the path of the expected spread thereof, that is immediate or will develop within a short period of time <H>, the ROC informs the local civil protection authority of the threat to trigger the public warning mechanisms. The need to inform the public triggers the risk communication process ((PR2)), combining the information received from the JOCP with the assessment carried out by the decision support unit, which then leads to sharing information with the public on what to do and what to avoid through national and/or local warning systems. Placing citizens under alert leads to a social and environmental emergency response, with the start of the ((SC5)) process.
A		
S	AGIF, I. P., ICNF, I. P., GNR	
C	Entire system	
I	PRV,CC	
F		
Aa		

[15] Request additional resources		CE: ANEPC
R	ANEPC	If there are not enough resources on site to suppress the fire <J>, the ROC requests additional resources from the operations and emergency management office.
A		
S		
C	CB	
I		
F		
Aa		

[16] Dispatch regional resources		CE: ANEPC
R	ANEPC	An extended attack means that resources have been exhausted or implies the need to involve a higher level of response. If the resources requested by the ROC are available at regional level <K>, the respective operations and emergency management office will request such resources from the originating entities.
A		
S	CB, GNR, ANEPC, ICNF, I. P., AGIF, I. P., FFAA, LGE, PRV	
C		
I		
F		
Aa		

[17] Dispatch national resources		CE: ANEPC
R	ANEPC	If the resources requested by the ROC are not available at regional level <K> but are available at national level <L>, the national operations and emergency management office will request the resources from the originating entities, based on the assessment carried out at national level of the current and estimated commitment to the extant response capacity.
A		
S	CB, GNR, ANEPC, ICNF, I. P., AGIF, I. P., FFAA, LGE, PRV	
C		
I		
F		
Aa	AGIF, I. P.	

[18] Request international resources		CE: ANEPC
R	ANEPC	The required resources may not be available at national level when absent or exhausted. In this case, and if the resources requested by the ROC are available at international level <M> and the assessment of the national situation confirms the need to activate international mechanisms, the relevant international organisations will be contacted within the scope of the bilateral protocols or other international mutual assistance agreements informing them of the applicable terms of reference (what, when, where, how long, etc.).
A	Supervisory authority	
S		
C	AGIF, I. P., ICNF, I. P.	
I	CM, FFAA, ORE	
F		
Aa		

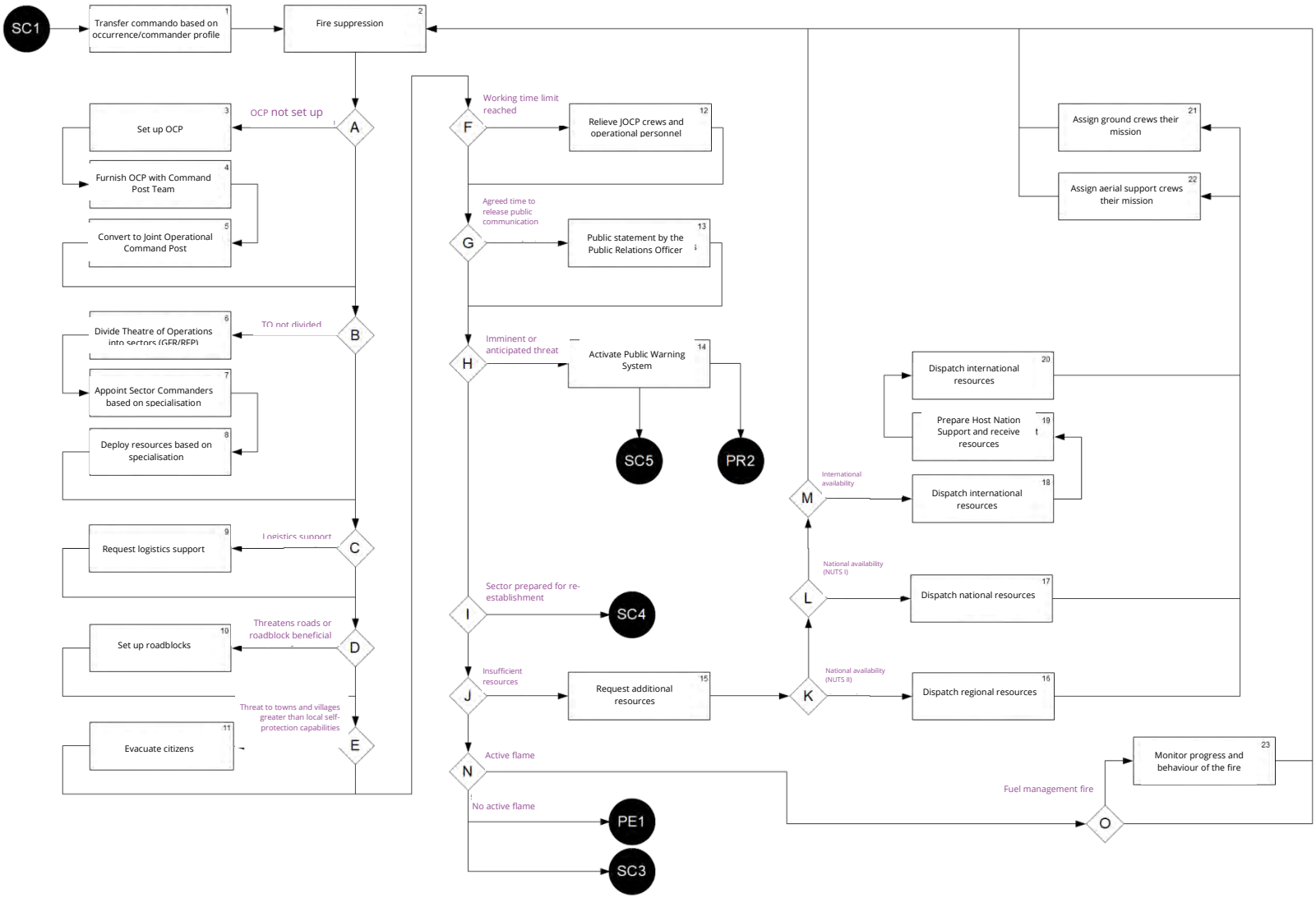
[19] Prepare Host Nation Support and receive resources		CE: ANEPC
R	ANEPC	When these international organisations are willing to help <M>, the internal procedures are carried out to receive international resources, ensuring logistics support (base of operations, accommodation, fuel, transport, etc.) and communication between the entities with liaison officers. Liaison officers are fluent, at least, in English, and priority is given to elements who speak the language of the supplying countries. Liaison officers are also knowledgeable of the SIOPS, and can be any civil protection agent or from an entity with a specific duty to cooperate.
A	Supervisory authority	
S		
C	AGIF, I. P., ICNF, I. P., GNR, FFAA	
I		
F		
Aa		

[20] Dispatch international resources		CE: ANEPC
R	ANEPC	When international resources are operating in national territory, these resources are dispatched to the nearest bases of operations and/or those that have better logistics conditions to accommodate the type of resource and given the place where they are going to intervene. Bases of operations are, preferably, the sites that receive international assistance, although international resources may also be received in national territory at other locations other than where they are going to operate during the mission, for logistics or operational reasons.
A	Supervisory authority	
S	CB, GNR, ICNF, I. P., FFAA, LGE	
C	AGIF, I. P., ICNF, I. P.	
I		
F		
Aa		

[21] Assign ground crews their mission		CE: ANEPC
R	ANEPC	Missions are assigned to ground crews according to their sector and the respective specialisation (GNR/RFP). Ground crews must be provided with updated maps of the place where they will be operating. If ground crews are not national, they are permanently accompanied by liaison officers.
A		
S		
C	AGIF, I. P., ICNF, I. P.	
I		
F		
Aa		

[22] Assign aerial support crews their mission		CE: ANEPC
R	ANEPC	Missions are assigned to aerial support crews according to their sector and the respective specialisation (GNR/RFP). When feasible and authorised by the pilots, international aerial support crews are dispatched together with national liaison officers to ensure coordination with ground crews. Depending on technical stopovers and checks, the missions assigned to aerial support crews are planned in such a way as to maximise daily flying hours, with clear goals focusing on the priority operation. Missions are also planned in such a way as to ensure overlap of interventions, thereby avoiding simultaneous refuelling of aircraft. Foreign aircraft operating in the national airspace are always escorted by national aircraft. National aircraft must be present in more complex operations, with the intervention of aerial support resources above the threshold defined by the aviation authority.
A		
S		
C	AGIF, I. P., ICNF, I. P., FFAA (AF)	
I		
F		
Aa		

[23] Monitor the progress and behaviour of the fire		CE: ANEPC
R	ANEPC	If there is an active flame <N> but the criteria are met for considering it a fuel management fire <O>, in one or more sectors, the number and type of resources are adjusted accordingly to monitor the progress and behaviour of the fire such that it becomes a controlled burn and confined to a pre-established perimeter thereby minimising subsequent rekindles and new ignitions in the coming months. If a fuel management fire <O> cannot be set and if there is still an active flame <N>, fire suppression operations are carried out in all sectors where necessary and as described in [2].
A		
S	CB, GNR, ANEPC, ICNF, I. P., AGIF, I. P., FFAA (AF), LGE, PRV	
C		
I		
F		
Aa		



Flow chart SC2. Extended attack

SC3

MOP-UP AND EXTINGUISHMENT

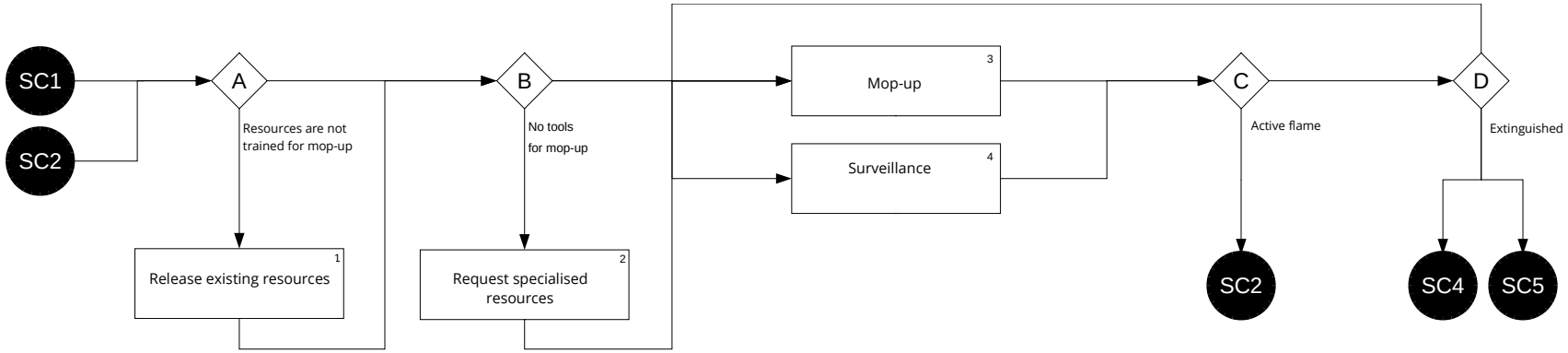
In the absence of visible combustion, mop-up is mandatory and aimed at isolating materials from possible reactivation and ensuring control of the perimeter of the fire, namely by eliminating or neutralising hot spots with priority use of hand tools or machinery, to extinguish the fire. A fire is considered extinguished when combustion is eliminated in the entire area affected by the fire and along the fire perimeter.

[1] Free up surplus resources		CE: ANEPC
R	ANEPC	Resources that are not needed for mop-up operations <A> are freed up for other suppression activities, prioritising site maintenance by specialised mop-up crews with additional capacity for monitoring, depending on the size of the sector(s) where mop-up is to begin.
A		
S	CB, GNR, ANEPC, ICNF, I. P., AGIF, I. P., FFAA, LGE, PRV	
C		
I		
F		
Aa		

[2] Request specialised resources		CE: ANEPC
R	ANEPC	When no specialised resources are available for mop-up operations <B>, whether due to the primary mission of crews present or the lack of mop-up equipment, the ROC requests specialised resources.
A		
S	CB, GNR, ANEPC, ICNF, I. P., AGIF, I. P., FFAA, LGE, PRV	Resources for the detection of hot spots can also be requested, such as personnel on board manned or unmanned aircraft.
C		
I		
F		
Aa		

[3] Mop-up		CE: ANEPC
R	ANEPC	Mop-up operations are carried out using dedicated teams, the provision of which is planned based on the analysis and assessment of the factors influencing the spread of a fire (weather, fuels and topography), fire history and the level of commitment (fatigue). Mop-up includes identifying intervention priorities and the resources needed in each fire sector, based on the respective 'window of action', always keeping early detection and extinguishment of hot posts front of mind using sector/fire perimeter inspection techniques and a combination of hand tools, heavy machinery and water. If an active flame is detected at any time during mop-up operations <C>, crews once again engage in initial attack ((SC1)) or extended attack ((SC2)) operations.
A		
S	CB, GNR, ANEPC, ICNF, I. P.,FFAA, LGE, PRV	
C		
I		
F		
Aa		

[4] Surveillance		CE: ANEPC
R	ANEPC	Surveillance continues during mop-up operations to detect the reactivation of hot spots. The entire fire perimeter is checked before declaring the fire extinguished and dismissing all resources, ensuring mop-up is carried out correctly and defining a fire perimeter check plan, to be carried out by the entity responsible in the operations area or by specialised mop-up teams in the morning up to three days after the fire has been declared extinguished. If an active flame is detected at any time during surveillance operations <C>, crews once again engage in initial attack ((SC1)) or extended attack ((SC2)) operations. When there is no active flame and the fire has been declared extinguished <D>, safety conditions are re-established ((SC4)) and social and environmental emergency response ((SC5)) activated, as needed.
A		
S	CB, GNR, ANEPC, ICNF, I. P., AGIF, I. P., FFAA, LGE, PRV	
C		
I		
F		
Aa		



Flow chart SC3. Mop-up and extinguishment

SC4

RESTORING SAFETY

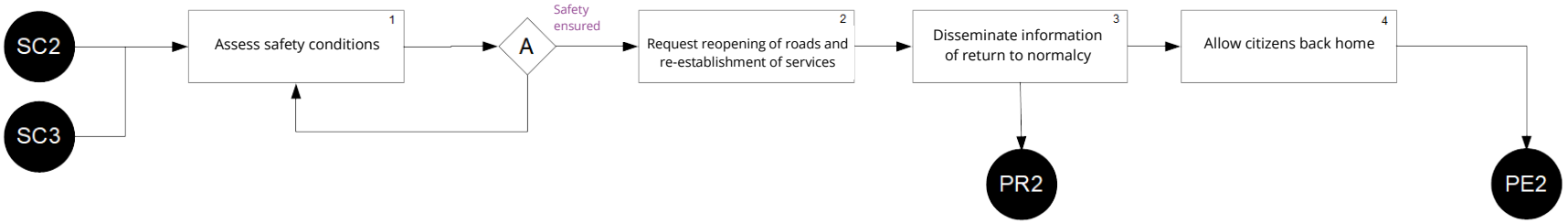
Assess safety conditions for the return of displaced populations, reopening roads and other services.

[1] Assess safety conditions		CE: ANEPC
R	ANEPC	If, during the operation, the situation has been resolved in some sectors as a result of extended attack ((SC2)) and mop-up and extinguishment ((SC3)) operations and in which safety conditions can be re-established, sectors/areas <A> must be identified where services can be re-established and roads reopened.
A		
S	LGE, CB, FFAA, GNR, PSP, PRV	
C		
I	Entire system	
F		
Aa		

[2] Request reopening of roads and re-establishment of services		CE: ANEPC
R	ANEPC	Provide information to entities indicating the sectors/areas in which services can be re-established. Request security forces to reopen roads in areas that are safe.
A		
S	LGE, CB, FFAA, GNR, PSP, PRV	
C		
I	Entire system	
F		
Aa		

[3] Disseminate information of return to normalcy		CE: ANEPC
R	ANEPC, CM	After basic safety is ensured and roads have been reopened, detailed information must be provided to the population on the location and expected time frame for the re-establishment of basic services that will gradually return to normal.
A		
S	AGIF, I. P., ICNF, I. P., GNR, INEM, I. P.	The need to inform the public of a return to normalcy triggers the risk communication process ((PR2)).
C		
I	Entire system	
F		
Aa		

[4] Allow citizens back home		CE: ANEPC
R	GNR, PSP	Evacuated or displaced citizens should be escorted by security forces, thus ensuring citizens return home.
A		
S	ANEPC, LGE, CB, PRV	
C		
I	Entire system	
F		
Aa		



Flow chart SC4. Restoring safety

SC5

IMPLEMENT EMERGENCY CIVIL PROTECTION PLANS

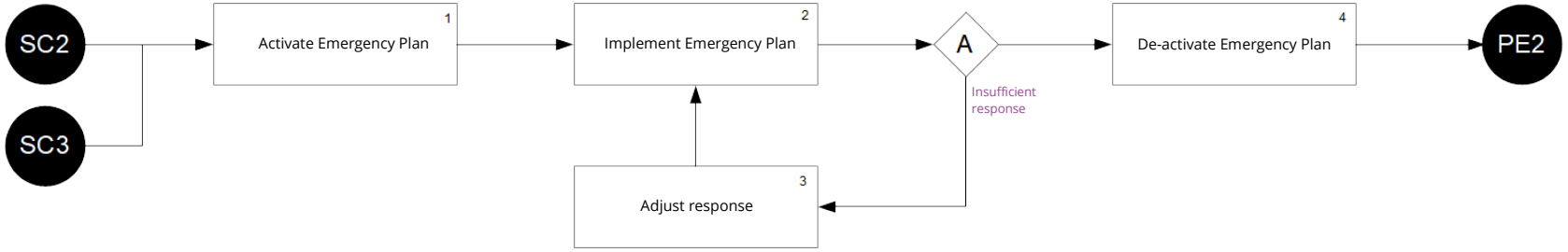
Provide assistance to affected populations and operational personnel, and emergency environmental intervention, by anticipating evaluation activities and the need to declare a state of alert, contingency or calamity, or activating emergency civil protection plans.

[1] Activate Emergency Plan		CE: ANEPC
R	CM	Monitor conditions that could lead to a change in risk. Activate emergency civil protection plans. Call a meeting of the Municipal Civil Protection Committee to design the response action plan.
A		
S	LGE, INEM, I. P., ISS, APA, CB, GNR, PSP, PRV, ORE, ANEPC	
C		
I	Entire system	
F		
Aa	CMPC	

[2] Implement Emergency Plan		CE: ANEPC
R	CM	The Municipal Civil Protection Committee assesses whether the personnel and resources provided for in the emergency plan <A> are sufficient and suited for the respective emergency response, or whether reinforcements are needed for specific areas. Among other initiatives: Activate assembly and accommodation zones for citizens (ZCAP), keeping affected populations apprised of the emergency situation, self-protection procedures, places of refuge and shelter, using the appropriate and available communication channels. Ensure continued assistance for citizens in ZCAPs provided by medical and healthcare, psychosocial and psychological teams, and logistics support teams. Strengthen areas of intervention according to the technical expertise of volunteers. Provide logistics support to operational personnel, namely food, fuel, medical and health care and field tents. Offer infrastructures for use by operational personnel as assembly and reserve areas.
A		
S	Entire system	
C		
I	Entire system	
F		
Aa	CMPC	

[3] Adjust response		CE: ANEPC
R	CM	If, after assessing the emergency situation, the personnel and resources provided for in the emergency plan are deemed insufficient, the Municipal Civil Protection Committee triggers the mechanisms defined in the emergency plan to adjust personnel and resources on the ground. This implies that personnel and resources can be added or discharged as needed depending on the occurrence in question.
A		
S	Entire system	
C		
I	Entire system	
F		
Aa	CMPC	

[4] De-active Emergency Plan		CE: ANEPC
R	CM	Once an emergency situation has been resolved, the emergency plan is deactivated. However, temporary response personnel and resources may still need to remain on scene, namely psychosocial support teams. Should the need for emergency stabilisation be identified during the response, the restoration process ((PE2)) is triggered.
A		
S	LGE, INEM, I. P., ISS, APA, CB, GNR, PSP, PRV, ORE, ANEPC	
C		
I	Entire system	
F		
Aa	CMPC	



Flow chart SC5. Implement emergency civil protection plans

PE1

INVESTIGATE THE CAUSES

The competent security forces investigate the causes of a fire based on evidence preserved on site by ground crews, evidence collected and providing evidence, determining the cause and stages of criminal proceedings.

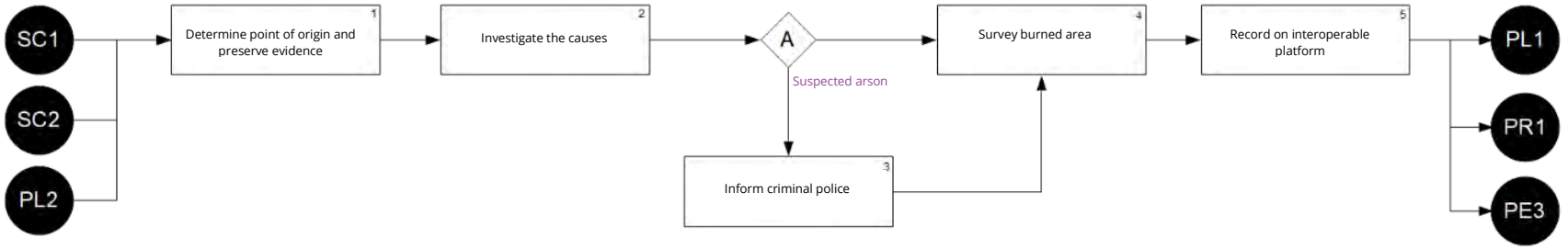
[1] Determine point of ignition and preserve evidence		CE: GNR
R	GNR	Fire alerts are sent automatically to security forces, thereby reducing deployment time and allowing the investigation to be started during suppression operations so as to gather information from ground crews and eye witnesses accounts.
A		
S	PSP, CB, LGE, PRV	Identify the point of origin and protect it, preserving the evidence so it can be processed properly and collected by security forces.
C		
I		
F		
Aa		

[2] Investigate cause		CE: GNR
R	GNR, PJ	Establish priorities in the investigation and allocate dedicated resources specialised in investigating the cause of fires, based on the likely cause, type of fire and damage caused.
A		
S		If arson is suspected, a criminal investigation <A> begins immediately and the official report is submitted to the Public Prosecutor's Office as quickly as possible, while the investigation into the causes of the fire is conducted, and the Criminal Police [3] informed thereof.
C	CB	
I		
F		
Aa	GNR	

[3] Inform criminal police		CE: GNR
R	GNR	The GNR notifies the Criminal Police of the suspected arson when there are well-founded suspicions that a fire was set, a body is found and/or in the event of grievous bodily harm, and when visible devices or objects suspected to have caused ignition are found so as to ensure preliminary proceedings and investigations are conducted within the shortest possible time.
A		
S		
C		
I	PJ	
F		
Aa		

[4] Survey burned area		CE: ICNF, I. P.
R	ICNF, I. P., CM	The surveying of burned area is carried out according to the rules for the production of cartographic information and the applicable operational guidelines ((PL2)). The survey is taken into account by the teams leading the investigation into the causes of the fire to determine damage caused. The production of cartographic information for areas spanning more than 10 ha should use remote detection procedures to speed up surveying.
A	GNR	
S	GNR	
C		
I		
F		
Aa		

[5] Record on interoperable rural fire management platform		CE: GNR
R	GNR, ICNF, I. P.	Record information related to fire investigations on the interoperable rural fire management platform, identifying the likely cause and adding non-confidential information from the official report drawn up to allow corrective measures to be implemented concerning planning, preparation, prevention and pre-suppression response. Upload the geographic information related to the point of ignition and the polygon of the burned area associated with the occurrence. Providing this information will also enable implementation of the planning ((PL1)), education and community capacity building ((PR1) and continuous improvement ((PE3)) processes.
A		
S	CM	
C		
I		
F		
Aa		



Flow chart PE1. Investigate the causes

PE2
RESTORATION

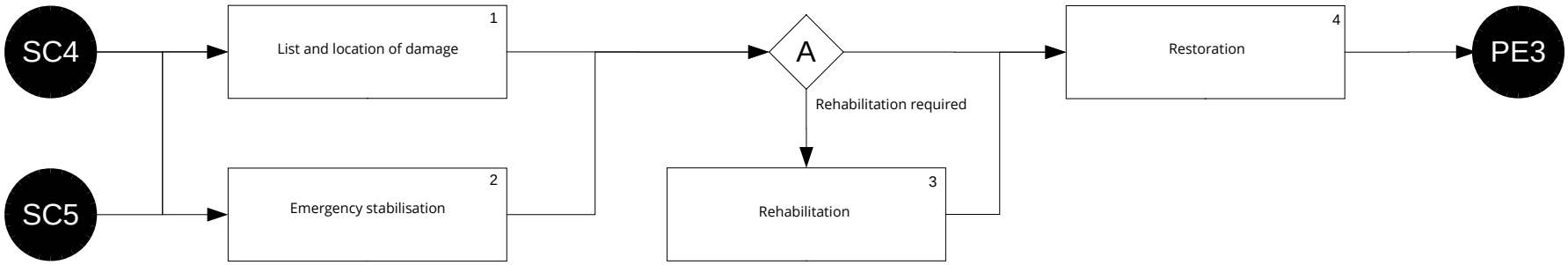
Implement planning measures to restore the territory and help communities return to normal, or to better adapt to the existing conditions, exploiting all identified opportunities to make the land and communities more resilient to future fires, in addition to emergency stabilisation initiatives and re-establishing basic services during the event. This process must safeguard the emergency stabilisation of the rural territory, restoration of potential agricultural and forestry production, buildings and social organisation, among other initiatives.

[1] List and location of damage		CE: CM
R	ICNF, I. P., ANEPC	Determine damage caused to rural territories, infrastructures and services at local level and record such information on the interoperable rural fire management platform.
A		
S	Entire system	Draw up a damage and severity report to substantiate proposals for emergency stabilisation and rehabilitation and restoration initiatives in rural areas and which justifies the funding needs for implementation thereof, detailing immediate and long-term damage and the socio-economic impacts. This process begins when the fire is still active and ends a few weeks later.
C		
I		
F		Assess whether rehabilitation initiatives need to be carried out <A> or if only restoration of rural areas is required.
Aa		

[2] Emergency stabilisation		CE: ICNF, I. P.
R	ICNF, I. P.	The first phase of the restoration of burned areas is known as emergency stabilisation, which could take place immediately after (or even during) the fire suppression phase.
A		
S	LGE, CGE, PRV	It aims not only at erosion control and the protection of river basins and land, but also emergency measures to protect fauna and flora of special conservation value and infrastructure safety measures.
C		
I	Entire system	
F		
Aa		

[3] Rehabilitation		CE: ICNF, I. P.
R	ICNF, I. P.	Where the need for rehabilitation has been recognised, the necessary initiatives must be carried out within the following two years during including, among other initiatives, assessing damage and ecosystem response, salvage collection and possibly physical plant health inspection, biophysical recovery and the reforestation of sensitive areas. In addition to containing the growth of invasive species and reducing the impacts on physical plant health, damaged infrastructures must also be rebuilt within the same time frame, that is, up to two years after extinguishment. Rehabilitation initiatives are carried out according to the operational guidelines defined in process ((PL2)).
A		
S	LGE, CGE, CB, PRV	
C		
I	Entire system	
F		
Aa		

[4] Restoration		CE: ICNF, I. P., ANEPC
R	ICNF, I. P., ANEPC	Restoration initiatives help mitigate the impacts of a fire and recover natural ecosystems and social performance. Restoration initiatives must focus on a landscape planning model and the implementation of agroforestry measures that allow for scale gains, mobilising agents capable of intervening in the territory and fostering biodiverse, resilient, viable and socio-economically sustainable production systems. These initiatives are carried out at local level according to the operational guidelines defined in ((PL2)), following the general principle of the need to evaluate capacity to restore yield potential within the first two years after extinguishment, after which, in the following years, the landscape regenerates with reforestation, density management, pasture management and game management. Alongside these initiatives a new landscape is designed, identifying the best options in a new social, institutional and financial framework, involving the system's two pillars of specialisation.
A		
S	LGE, CGE, CB, PRV	
C		
I	Entire system	
F		
Aa		



Flow chart PE2. Restoration

PE3

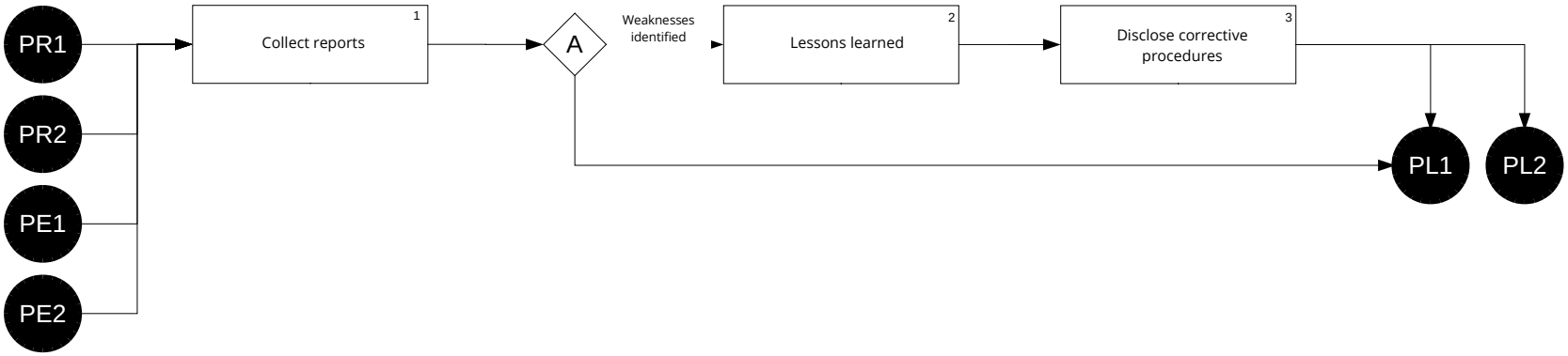
CONTINUOUS IMPROVEMENT

Continuous improvement is an ongoing activity that helps increase the efficiency of the IRFMS process chain and ensures that the goals are achieved in a way that satisfies citizens. In addition to the lessons learned mechanisms, this process incorporates the best knowledge harnessed from universities and research centres.

[1] Collect reports		CE: AGIF, I. P.
R	AGIF, I. P.	The reports drawn up in the IRFMS process chain are collected to analysis and assess the current situation. When available, a list is made of lessons learned.
A		
S	Entire system	
C	Entire system	
I	Entire system	
F		
Aa		

[2] Lessons learned		CE: AGIF, I. P.
R	AGIF, I. P.	When weaknesses or obvious shortcomings in any of the processes <A> are identified, a lessons learned procedure begins to identify the root or source of the weakness or shortcoming. This method focuses on procedure rather than accountability. Proposals for corrective measures are drawn up as a result of the lessons learned procedure, which are then tested before the issue that gave rise to it is deemed closed, that is, a lesson learned entails identification of the problem, corrective measures, testing the improvement and, when effective, definitively including it in the procedures.
A		
S	Entire system, universities, CoLab	
C	Entire system Universities, CoLab	
I	Entire system	
F		
Aa		

[3] Disclose corrective procedures		CE: AGIF, I. P.
R	AGIF, I. P.	The corrective procedures resulting from [2] are communicated to all IRFMS entities which incorporate them into their operational guidelines to assess the outcome. When a corrective measure is ineffective, the problem is reported again and enters the continuous improvement process. When a corrective measure is effective, it becomes definitive and the respective lesson learned process is closed. Corrective procedures can also influence strategic guidelines.
A		
S	Entire system	
C	Entire system	
I	Entire system	
F		
Aa		



Flow chart PE3. Continuous improvement

GLOSSARY

a) **Agricultural residues**: woody and other plant material resulting from forestry and agricultural activities**;**

b) **Agricultural territories**: land occupied by agriculture and improved pastures, according to the technical specifications of the Land Cover Map (COS) of Continental Portugal;

c) **Controlled fire**: the use of fire in the management of forest land, under controlled conditions and following rules and procedures to achieve specific and quantifiable goals;

d) **Counter fire**: the use of fire to attack rural fires that involves setting a fire along a support zone ahead of the fire front to cause an interaction between the two and change the trajectory of the spread of a fire or to extinguish it;

e) **Developed territories**: land that is used for activities involving human intervention, including built-up areas, industrial areas, commercial areas, areas used for tourism, road and railway networks, service areas, gardens and facilities, according to the technical specifications of the Land Cover Map (COS) of Continental Portugal;

f) **Extensive burn**: the use of fire for renewing pastures, crop elimination and to burn agricultural residue or to manage forest or agricultural vegetation that has been cut but not heaped into piles;

g) **Fire detection and surveillance network**: the various infrastructures, facilities and resources that enable implementation of fire detection, surveillance, inspection and deterrence initiatives, involving, in particular, the permanent fire detection and surveillance network stations, strategic staging locations, special mobile surveillance routes and trails, video surveillance and other technologically appropriate resources;

h) **Forest land**: land occupied by forests, scrublands, natural pastures, agroforestry areas, open areas or those with little or sparse vegetation, according to the technical specifications of the Land Cover Map (COS) of Continental Portugal;

i) **Forest road network**: the various roads that cross forest land used in the management thereof, including for the movement of vehicles to exploit natural resources, the planting, management and exploitation of forest stands and pastures;

j) **Fuel management**: the creation and maintenance of horizontal or vertical discontinuities in fuel loads in rural territories, by changing or partially or totally removing plant biomass using the latest recommended techniques at the scale and as often as required to meet the targets set for the intervention areas;

k) **Fuel management fire**: the use of fire which, in proper weather conditions and in rural areas, allows a fire to burn within a pre-established perimeter and with a reduced number of fire suppression resources inside said perimeter;

l) **Governance**: institutional arrangements involving actors, rules, conventions, processes and mechanisms used to gather, analyse and disseminate information resulting from risk management decisions;

m) **Mop-up**: a mandatory operation aimed at isolating materials from possible reactivation and ensuring control of the perimeter of the fire, namely by eliminating or neutralising hot spots with priority use of hand tools or machinery to extinguish the fire;

n) **Restoration**: activities carried out aimed at implementing recovery and rehabilitation measures, such as mitigating impacts and ecosystem recovery;

o) **Rural cluster**: the area identified on the Land Use Map (CRUS), which ensures the qualification of clusters as spaces used for habitation and rural development and infrastructures that use solutions appropriate to the characteristics thereof;

p) **Rural fire**: a fire that occurs in rural areas;

q) **Rural fire hazard**: the likelihood of a rural fire occurring in a given period of time and area, based on the territory's susceptibility and scenarios considered;

r) **Rural fire risk**: the likelihood that a rural fire will occur in a specific location under certain circumstances and the impact thereof on the affected elements, namely their value;

s) **Rural land**: that defined in the Land Use Map (CRUS) and which, because of its suitability, is used, inter alia, for agriculture, animal husbandry, forestry, the conservation, development and exploitation of natural resources, geological resources or energy resources, and as natural, cultural, tourism, recreational and leisure areas or risk protection, even if occupied by infrastructures, and not classified as urban land;

t) **Rural territories**: agricultural and forest lands;

u) **Rural-urban interface**: the area of proximity between the rural and developed areas on rural and/or urban land where the IRFMS intervenes with a view to adopting measures to protect against the threat of rural fires;

v) **Suppression**: a specific and targeted initiative aimed at extinguishing a fire that involves four primary phases: initial attack, extended attack, mop-up and extinguishment;

w) **Suppression fire**: the technical use of fire to attack rural fires that includes tactical fire and counter fire;

x) **Susceptibility to fire**: an area or territorial unit prone to fire, assessed based on its innate characteristics and which can be more or less susceptible depending on the conditions conducive to fire outbreak and spread;

y) **Tactical fire**: the use of fire to attack rural fires that involves setting a fire along a support area to reduce fuel availability and thus reduce the intensity of the fire, end or correct the extinguishment of a mop-up area to reduce the likelihood of rekindles or to create a safety zone for the protection of people and property;

z) **Technical fire**: the use of fire that involves controlled fire and suppression fire;

aa) **Waste burning**: the use of fire to burn agricultural residue or to manage forest or agricultural vegetation that has been cut and piled into a small, limited space;

bb) **Water point network**: water storage structures, accessible water bodies and outdoor hydrants to replenish fire suppression equipment;

cc) **Urban land**: that defined in the Land Use Map (CRUS) and which is totally or partially urbanised or built-up and, as such, is earmarked for urbanisation or construction in the spatial plan.

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