Landscape Fire Governance Framework

Guiding Principles for
Adjusting Strategies, Policies, and Management, to Global Change

With over 300 million hectares burned annually, Landscape Fires are assuming increasingly extreme characteristics and causing more severe impacts on populations and ecosystems. They are a local problem with global consequences. Fires are a synthesis of the context, and as such, they arise from socio-economic dynamics mediated by public policies and economic incentives that determine land use and occupation, as well as our use of fire, and social dynamics. The diversity of causes, their systemic nature, and a growing number of stakeholders with different visions and solutions require that the simpler dichotomy of prevention and response gives way to a more robust framework capable of addressing complexity and uncertainty. To better prepare societies to achieve sustainable development goals and ensure lower losses in fires, the technical and scientific community at the 8th International Wildland Fire Conference in Porto, proposes a fire governance model (Landscape Fire Governance Framework) that brings governments, businesses, academia, and members of civil society together in balanced and technically supported solutions. This framework presents the guidelines for the development of this model.

Summary

i. Unplanned and uncontrolled landscape fires are increasing, correlated with social, economic, and ecological changes. This creates both direct and indirect socio-economic impacts, such as loss of lives, property and livelihood, health, and safety issues, and negatively impacts sustainable development goals, as more than 300 million hectares are annually affected.

ii. The Landscape Fire Governance Framework ("framework") is a legally non-binding, voluntary, set of guiding principles, goals, and governance proposals, for adjusting strategies, policies, and landscape fire management at a global level, answering to global challenges. The framework is aimed at policy makers and decision makers.

iii. Under the framework, integrated fire management is considered critical for sustainable landscape management, developing governance models that address risk and involve different stakeholders, bringing together the diversity of scientific and cultural knowledge, values, and political options. International guiding principles are proposed, as an orientation towards the management of the increasing risk of wildfires.

iv. The framework does not intend to supress or ignore national or local options and heritages, but rather to offer a view into a shared goal of a significant loss reduction from wildfires, adding expertise and the latest research and scientific knowledge, enhancing risk governance, and having a clear scope of action for all stakeholders.

v. Action is needed strengthening governance models, as responding to such a complex challenge requires the best coordination possible among all stakeholders. Similarly, valuing rural areas will help people getting a return from the land, which in turn allows them to better care and manage their land, reducing exposure and vulnerability to wildfires. Action is also needed changing behaviours, avoiding actions that result in unplanned and uncontrolled fires. Should these fail, response is needed, and to that end, training and qualification programmes offer the best-qualified responders, suppressing fire, protecting people and their livelihoods.

vi. The proposed governance model calls for fire risk assessment and determining how communities and cultures perceive risk and accept fire impacts. That perception drives risk management and helps communicating clearly. Stakeholder engagement is crucial for governance, and having stakeholders involved in decision-making helps with monitoring and aiming at continuous improvement, measuring progress and planning for shorter periods under a context of uncertainty.

vii. The framework governance model recognizes that fires have a broader value chain than just prevention, suppression, and recovery, and as such proposes a value chain where all accountable actors have a role to play. This calls for integrated actions and good communication between all stakeholders, as they must understand what the challenges are and what deliberations are asked for.

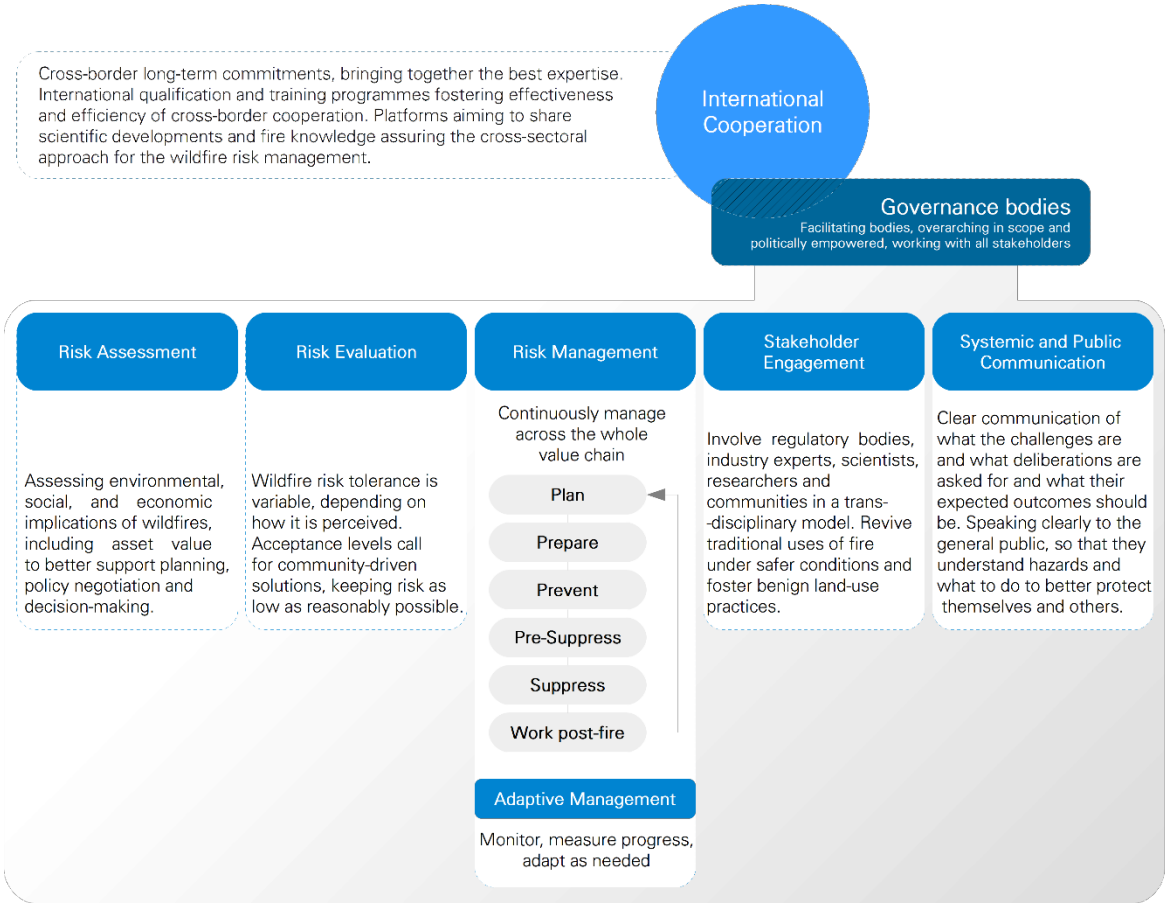
viii. To better achieve integration of stakeholders and clear communication, overarching governance bodies are useful politically and technically empowered tools, facilitating domestic coordination as well as international cooperation.

ix. International cooperation benefits from qualification and training programmes, based on widely accepted standards, fostering effectiveness and efficiency of cross border cooperation, but also creating a good platform for the exchange of information on best practices at all stages of the wildfire value chain.

x. Moving forward, based on this framework, countries are invited to promote integrated landscape fire management by bridging existing gaps through governance options that foster cross-agency and cross-sectoral dialogue, and to join efforts to strengthen networks and thematic resource centres for domestic and international sharing of best practices and innovation. Under the United Nations, this framework could also be the base for further, binding agreements.

xi. An international mechanism, under the United Nations, is sought, to promote the implementation of a global integrated fire management programme, and to facilitate financing of integrated fire management actions, worldwide.

xii. Integrated fire management requires moving from management alone to solid governance models and stakeholder engagement with clearly set roles at all value chain stages, training and qualification programmes, and strengthened international cooperation.



A summarized diagram view of a landscape fire governance continuum

Preamble

1. On average, more than 300 million hectares (3 million square kilometres) of vegetated natural, cultural, rural, urban, and industrial landscapes are annually affected by fire. A large proportion of the global area burned is due to recurrent natural, lightning-caused fires, human-caused due to negligence and arson, or traditional use of fire in land management, as part of historical and sustainable fire regimes.

2. However, a significant share of unplanned and uncontrolled wildfires has detrimental impacts on the environment and society. The problem is increasing due to the mutually influencing and reinforcing consequences of social, economic, and ecological changes (e.g. land-use change, demographic change, ecosystem degradation, spreading of invasive species) and climate change.

3. In some regions, these changes have been magnified by a persistent and pervasive emphasis on fire exclusion and fire suppression. While pursuing to eliminate fire from the landscapes, the over-reliance on fire suppression often results in fuel accumulation and continuity leading to increased wildfire hazard and risk in many regions. This trend is amplified by the ongoing abandonment of rural lands in many areas, which increases fire susceptible surfaces and creates conditions for the increasing occurrence of wildfires of high intensity and severity.

4. Climate change contributes to the occurrence and duration of droughts in many areas of the world, associated with heat waves, aggravation of impacts of fire exclusion policies and abandonment of intensive land cultivation. This, in turn, leads to flammable fuel accumulation, resulting in extreme wildfires which are difficult and often impossible to control. In addition, post-fire impacts such as loss of topsoil layers, floods and landslides, and land erosion, often lead to the degradation of the stability, and productivity of natural and cultural landscapes. The fire-induced degradation of vegetation cover leads to a loss of biodiversity and to a reduction of terrestrial carbon sequestration capacity. Wildfires also have direct socio-economic impacts, through the loss of lives and the loss or damages of livelihood, property and critical infrastructure, as well as indirect impacts, e.g., on human health and security, causing injuries and – through smoke exposure – short-to long-term health problems and premature mortality.

5. As climate change mitigation efforts largely rely on securing the potential of forests and other vegetation types, including organic terrains such as peatlands and wetlands, for long-term sequestration of terrestrial carbon, it is critical to ensure that institutions minimize the risk of losing this potential in the long term. At the same time, conflicts among land management and other policy objectives need to be resolved. For example, the need to reduce accumulation of flammable fuels and the need to protect ecosystems characterised by high biodiversity and carbon storage need to be carefully balanced.

6. To assure that wildfires and inappropriate use of fire in land use and land-use change are not contributing to deforestation, biodiversity losses and transfer of carbon to the atmosphere, jeopardizing efforts to mitigate the consequences of climate change and to implement Sustainable Development Goals (SDGs), significant improvements in policies and processes are needed for enhancing integrated fire management capabilities from local to national and international levels.

7. The drivers of the problem, their interconnection, the number of different stakeholders involved, the dispersed, often difficult to access knowledge and the large economic burden, require the development of governance models that allow to tackle the challenges of this systemic risk and "wicked problem".

8. In many countries, current policies and institutional arrangements are addressing fire management through sectoral perspectives, services, and actions, which are disconnected and thus are insufficient to cope with the ambiguity, complexity, and uncertainty of the problem. There is a general neglect of addressing the underlying causes of vulnerability of society and the environment to wildfires and an absence of long-term planning and investments in integrated fire management. Conversely, prioritization and investments are prevailingly focusing on fire exclusion and suppression, creating a false sense of security in face of future uncertainty.

9. It is therefore useful to shift from traditional state-centric and response-focussed approaches with hierarchically organized governmental agencies to multi-tiered systems involving different societal, institutional, and political actors, with their different expectations and perceptions, based on the inclusion of diversity of knowledge, values and political interests that will frame international guiding principles of integrated landscape fire management.

10. Countries that exceled in command and control and in fire management approaches, as well as those that are now being more exposed to the problem will benefit from guiding principles that help then moving towards enhanced governance at local, regional, national, and international levels. Moreover, an international instrument is required, that relies on and further strengthens the pathway of initiatives and achievements in international cooperation in integrated fire management. Countries, intergovernmental organizations, and other stakeholders are encouraged to support the call for an international Landscape Fire Governance Framework, which will address the increasing risks of wildfire occurrence and damages to the environment and society by developing policies and respective governance for implementation.

11. The international Landscape Fire Governance Framework and its guiding principles will help country leadership to develop policies and governance that take advantage of existing knowledge of integrated fire management and allow the development of adequate legal provisions, finances, and support programmes, building of institutional structures and active participation of civil society. This is also an instrument for using the best technical knowledge, harmonizing technical references, training, creating mutual aid protocols at international level, according to their capabilities and needs, and renewed risk governance mechanisms.

12. The delegates attending the 8th International Wildland Fire Conference, held in the city of Porto, Portugal, from 16 to 19 May 2023, recognize the international Landscape Fire Governance Framework as an instrument to tackle the growing occurrence of severe wildfires and the misuse of fire in land-use change that are creating significant negative impacts on the environment and society.

13. The delegates are determined and committed to foster adoption of the framework hereafter, thus working to reduce the vulnerability and increase the resilience of natural, cultural, and urban-industrial landscapes and society living therein to wildfires, helping better rebuilding, and leading to a reduction in lives and resources lost and overall wildfire disaster risk reduction and mitigation, progressively replacing organizational silos and promoting shared actions.

14. This framework will help protect natural, cultural, and intangible heritage, working closely with communities, particularly with those where fire is of ancestral and traditional use, with special care for the most vulnerable population groups, with the aim of learning from each other and promoting techniques based on scientific evidence and safer conditions for the use of fire, unbound by jurisdictions and borders.

Goals and Expected Outcomes

Goals

15. The development of integrated landscape fire management policies and governance should consider dual facets of landscape fires. On the one hand, in many natural and cultural landscapes natural fires, the ancestral use of fire, as well as the use of prescribed fire based on advanced scientific evidence, historically have been – and in future will continue to be – important for maintaining natural ecosystem processes and essential for sustainable management of a range of land-use systems. On the other hand, because of socio-economic developments and changes of land use and the climate, many natural and cultural landscapes and society living therein are becoming increasingly vulnerable to uncontrolled wildfires of increasing sizes, intensities, and severities. In many regions, the increasing vulnerability of land and people to wildfires can be attributed to abandonment of traditional land use including the traditional use of fire in the rural space.

16. Given the fact that land management is essential in determining the occurrence and the potentially beneficial vs. destructive impacts of fire, the overall goal of the Framework with its Guiding Principles is to manage lands and fire towards increasing the resilience of the rural landscapes against wildfires instead of attempting removing fire from the landscapes. Unlike most of the geological and hydro-meteorological hazards, such as earthquake, tsunami, hurricane, extreme rainfalls – uncontrolled wildfires represent a hazard and a risk which can be prevented in many cases. Integrated fire management (IFM) synthesizes the prerequisites of the living cultural and natural landscapes and society with the aim to maintain or restore sustainable, productive, and disturbance-resilient land as a safe space for people living therein.

17. Since traditional and advanced knowledge of IFM principles is available for all vegetation types, the systematic application of IFM, notably community-based fire management approaches, should be promoted by prioritizing exchange of expertise between countries and continents. To implement IFM, there is a demand for capacity building, investments, and outreach work at global level. Fire management programmes, committees, and workgroups, international, regional, or domestic, for capacity building including training in fire management should be supported by countries and international organizations. Bilateral and multilateral legally binding agreements and voluntary exchange instruments are needed.

18. These goals of the Framework are addressing, among others, the Sustainable Development Goals 13 and 15 and meet the Guiding Principles and Priorities for Action of the Sendai Framework for Disaster Risk Reduction (SFDRR). Furthermore, effective IFM may constitute an accountable contribution to reduce greenhouse gas emissions, maintain or increase terrestrial carbon pools in all vegetation types and ensure ecosystem functioning. Effective IFM will contribute to the implementation of the United Nations Framework Convention on Climate Change (UNFCC) and the Paris Agreement, the Convention on Biological Diversity (CBD), and the United Nations Convention to Combat Desertification (UNCCD), the World Heritage Convention (WHC), and other international conventions such as the Ramsar Convention on Wetlands or the Council of Europe's Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and Euro-Mediterranean Major Hazards Agreement.

Expected Outcomes

19. The expected outcome of the Framework is to achieve:

A significant reduction of losses driven by added expertise on each component of the value chain, enhanced risk governance incorporating the latest research and scientific knowledge, and a defined set of responsibilities and accountability with each stakeholder having a clear view of their scope of action, where the risk is adequately accessed and evaluated, institutional cooperation is agreed upon, communities are involved and have active voices in the process, and communication is clearer, objective, and transparent.

20. Furthermore, these goals help strengthening interoperability and thus the effectiveness and efficiency of international response to wildfire emergencies.

Guiding Principles

21. Governments and government agencies are encouraged to move past a silo mindset where each governmental institution works vertically, focussed on their sectoral mandates, into an integrated approach in policy making, with broader, transversal scope solutions and shared responsibilities and budgets, building upon good practices many countries have already established.

22. The development of national fire risk management policies should be based on politically neutral and bipartisan consent as legislation may be required to initiate and consolidate stable and durable structural changes in administration and develop and finance programmes exceeding national government election periods.

23. While national contexts, including their laws and cultural heritages, must be considered, the Framework should be guided by a sound set of principles, to which all stakeholders can adhere to, creating trust and moving change forward. Key principles include but are not limited to:

    a. Impact orientation – Actions seek to obtain results for the benefit of citizens and their material, cultural and historical heritage, to safeguard their safety, their sources of livelihood and the social, environmental, and economic value of their context, while considering impacts on the longer term.

    b. Feed-forward strategies – Risk assessment and evaluation considers uncertainty and thus requires the incorporation of multiple future scenarios.

    c. Bottom-up policies design – The definition of public policies considers the expectations and knowledge of local communities, involving them in the decision-making processes. Policy development and strategic planning shall be holistic, addressing the fire problem at landscape level by including all relevant institutional mandates and the potential and capacity of contribution of the civil society.

    d. Progressivity in transition – Wherever current governance models require change, the transformation of those models towards this framework is gradual, specializing the most needed skills while institutional rearrangements take place.

    e. Subsidiarity – Actions evolve according to the capabilities of each response level, activating subsequent levels whenever those immediately below have exhausted their capacity.

    f. Plural use of resources – The commitment of the operational forces is carried out in accordance with the current conditions, with priority to suppression when necessary, and priority to prevention actions when there are no conditions for the ignition and progression of fires.

g. Rational allocation of resources – The use of resources and their translation into any actions seeks efficiency, avoiding the inadequacy of resources, disproportionate allocation, and poor control of expenditure. Actions comply with quantifiable and measurable objectives.

h. Training of agents – Agents involved in all actions hold the qualifications considered necessary to carry out the assigned missions at any time in response, technical, directing, commanding, or manoeuvring duties. The agents involved have access to the material resources necessary for a successful mission, and all the operatives have physical, medical, and psychological conditions suited to their missions, at all levels.

i. Operational flexibility – Operations are planned and developed according to present or foreseeable needs according to the analysis of meteorological information or foreseen circumstances, seeking to apply sufficient resources to the response and its previous movement in space and time. Operational readiness follows the foreseeable necessity rather than a set calendar.

j. Transparency – All procedures are auditable and performed according to established and clearly identified criteria. The motivation for performing any acts must be clearly justified and published. The performance of agents is subject to public reporting.

k. Evaluation – All agents and all their actions are analysed and evaluated with a view to the continuous improvement of the system, and of the agents, individually, whenever necessary. This information should feed into a lessons-learnt system.

l. Memory – Agents develop their activity in an evolutionary process that considers the history of the country, its institutions, and all those who have been severely or fatally affected by the phenomena they seek to avoid or mitigate.

m. Transdisciplinary and Innovation – Policy and strategic planning and relevant decision making shall be based on sound, multi-disciplinary, scientific knowledge and considering technological capabilities and innovation. This will include considering the revival of traditional, socio-economically sound, and environmentally benign land-use practices.

n. Coherence – The mandates and activities in fire management of State institutions and other stakeholders shall be coherent (harmonized) and meet the overarching national fire management policy and implementation plan. National Fire Management Plans are to be considered on all individual, institutional, and sectoral planning and activities.

o. Coordination – The implementation of actions under Fire Management Plans shall be monitored in a permanent basis and highly coordinated.

Priorities for Action

24. Time is due for a global cooperative effort on enhancing landscape fires risk governance. This effort should embrace local communities, understanding their necessities and taking into consideration their heritage and ancestral ways of interacting with fire and living from the land. To that end, the actions below should be prioritized.

Strengthening the governance model

25. Landscape fire management governance benefits from deciding what is suitable for each level of government, avoiding gaps between the higher level, such as a national or international level

of decision-making, and the local level. As wildfires are the result from a wide range of factors, and affect many different areas of society and government, including, but not limited to, environment, agriculture, rural development, forestry, economy, and health, action is needed through an overarching and cross-sectoral governance body, suitable to help closing the policy and institutional gaps and strengthening dialogue and coordination between all relevant areas of expertise and intervention.

Valuing rural areas

26. With today's global and local challenges, such as climate change, socio-economic changes, migration, and other factors influencing or contributing to sustainable development, rural spaces should be developed considering principles that are designed for the transition to a green, low carbon, and circular bioeconomy. These options 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 agriculture, forestry, and nature conservancy. Action is needed valuing rural areas so that people are encouraged to actively manage them.

Actively managing rural areas

27. Tending to the land and caring for communities requires knowledge of the risks, ability to anticipate and minimise hazards and to take timely and effective action to respond to a wildfire individually and collectively. Since sustainable management and successful protection of lands and communities against wildfires will reduce negative externalities for the local, national, and global community, local actors need to be empowered and financially subsidized to develop relevant institutional and technical capabilities. Action is needed managing rural areas, to reduce impacts and better prepare the land for the occurrence of fire.

Changing attitude and behaviour

28. Adapting behaviours can help limit or reduce levels of exposures and vulnerabilities. Changing behaviours aim at promoting the adoption of best prevention and protection practices among the population and to reduce sources of ignition. Action is needed, conciliating communal interests, offering alternative means for managing flammable fuels and keeping citizens informed on the best practices to avoid the negative impacts of fire and keeping themselves safer.

Training and Qualification

29. A training and qualification model should be designed promoting greater coordination among the entities that intervene in fire management, incorporating effective knowledge into the IFM, 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. It should be a model that simplifies all functions performed while at the same time ensuring the consistency and coherence thereof.

30. Qualification of agents can be achieved through a Qualification Programme (QP) under national policies for IFM, 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. In this fashion, qualification is an enabler, cutting

across the entire fire value chain. A multi-agency partnership to carry out the QP is recommended, defining the mechanisms for regulation, implementation and, consequently, monitoring and evaluation. Action is needed to create or strengthen a permanent collaborative space, designed for the study, planning and strategic proposal of the system, for continued learning on a platform where all stakeholders are represented, ensuring the QP is properly implemented.

Governance

31. With increasing wildfire risk political leadership and state agencies are faced with complex challenges, as agencies responsible for land management and fire management are under pressure to present certainty and competency. Critical differences in power, authority, and capacity within and between relevant institutions and actors can be an impediment for informed communication and cooperation, since addressing wildfire risk involves trade-offs between competing values and interests of actors. Wildfire risk should be viewed as negotiated with stakeholders rather than simply determined by quantitative models that might not consider stakeholder needs.

32. These challenges reveal that landscape fires – both inappropriate use of fire and wildfire – represent a complex systemic risk, which requires, the development of a governance model based on the proposed guiding principles. This governance model should consider orientations as outlined below.

Fire risk assessment

33. Risk characterization that encompasses hazard identification and assessments of exposure and vulnerability are prerequisites for effective fire risk assessments which represent the knowledge base for all fire management activities. It is also crucial to assess environmental, social, and economic implications of wildfires and to include the value variables of assets to better support future negotiations and decisions. Furthermore, risk assessment should include predictive analytics and projections under different scenarios to assess fire activity under different future socio-economic, climate, and environmental scenarios, accounting for the factors that may affect wildfire risk over time.

34. The risk perception of different socio-economic groups should also be assessed, understanding the cognition and comprehension of wildfire, and understanding how stakeholders' opinions and concerns can be formulated and included. Besides the importance for the risk evaluation process, it will also help defining mechanisms for early warning, which are easily understood by exposed populations, avoiding impacts of potentially harmful events.

35. The methodologies used in this process should be tailored to the level of governance they are being employed at, and they should be clear, ideally consensual, and coherent, and properly communicated.

Wildfire risk evaluation and tolerance

36. Tolerances to wildfire risk vary, depending on how different populations and cultures perceive and accept impacts. When evaluating risk, acceptance levels should be characterised, recognizing the need for community-driven solutions and consider the probability and the severity of the events, keeping risk as low as reasonably possible.

Wildfire risk management

37. Risk should be managed to achieve the levels of acceptance, taking stock of the integrated fire management guiding principles. In managing risk, governance is of utmost importance, driving public and private sector agents, corporate and individual, into cross-sectoral cooperation, actively promoting work on all stages of the integrated fire management value chain.

Integrated Fire Management (IFM) – The Value Chain

38. The integrated fire management value chain recognizes that before, during and after fire use or a wildfire, it should be determined who are informed, competent and accountable actors for assigned tasks in each stage of the value chain. The following stages are focusing on wildfire risk reduction, for which the safe and sustainable use of fire in the management of natural ecosystems and cultural landscapes is an integral element. The prerequisites for successful realization, annexed to this framework, are a guidance tool:

    a. Planning defines the interventions and resources needed to implement the programmes and projects that will help to meet fire management objectives. Strategic guidelines are to establish national guiding principles that can be adapted at all levels below, while also allowing for preparation of operational guidelines, translating the strategy into actions that can be executed on the landscape. Adequate unified landscape fire budgets are required for enabling all relevant actors to carry out their activities.

    b. Preparation includes the 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. Those include educating and building capacity at the community level, driving changes in behaviour, and helping people learn how to self-protect, best achieved through active participation of citizens and the society at large. Preparation also includes communicating risk in a manner that is easily perceivable by everyone. Communicating risk in a timely and simple way will help people make use of the tools and resources they have acquired to take actions and avoid exposure to unwanted wildfires.

    c. Prevention involves the implementation of 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.

    d. 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 to act upon. Pre-suppression requires risk assessment, to analyse the parameters that determine an increase in response capacity and information to the population, surveillance, to dispatch surveillance resources and deterrent security forces to critical areas and pre-positioning, to preventively position suppression and relief crews in critical areas.

    e. Suppression is the stage that involves extinguishing a wildfire (fire suppression) and deploy relief operations to help those who are affected or will be affected by the spreading of a wildfire, mitigating its consequences.

    f. Post-fire operations include processes that take place after the fire (or during a fire, in sectors already considered safe). Post-fire is the stage for concluding the investigation of the causes of a wildfire event, to repair damages from fire suppression, for the restoration of the land and for the recovery of communities returning to their baseline and identifying

lessons-learnt, both in improving and practises that already work well, including sources of knowledge from all sectors, public and private. Post-fire actions are the opportunity not to be missed in creating resilient landscapes and communities, and reducing future disaster to support this framework's goals.

Adaptive management

39. Assuming the context of uncertainty in which IFM is developed, a systemic monitoring of long-term plans is required, and the future scenarios re-evaluated, based on the change of context verified or results achieved. The adaptive management strategies should promote the robustness of the IFM system, enabling it to achieve the desired goals even if face of information gaps, through the communication of clear targets, the qualification and training of human resources, and flexible planning.

40. The results of fire management interventions are to be assessed and monitored regularly, aiming at continuous improvement. This should allow to identify and build on the lessons-learnt in the process, applicable both to the IFM and within agencies, driving the implementation of corrective measures, as and when needed.

41. The decision process should be informed by key performance indicators to measure progress in fire management. Objective targets should respect heritage and community needs and knowledge, and to this end, governments and private entities should seek partnerships with local communities and create a bond that clearly guides defining measurable goals, thus guiding the decision process.

42. Planning decisions should not be immutable, over a relatively long interval like 5 or 10 years, rather revised in shorter periods, annually or bi-annually, and be adaptable at various levels, incorporating information for local levels in future revisions. The status of implementation measures, the results achieved, and the evaluation of the plans overall should be periodically reviewed and published.

Stakeholder engagement

43. Decisions on the management of landscape fires should involve all relevant stakeholders, asking for their commitment in developing policies for addressing fire issues, including scientific developments, and incorporating the knowledge of local communities. The engagement of affected stakeholders to collectively decide the best way forward and the extension of the debate to civil society about wildfire risk and its underlying implications, are also necessary to deal with the uncertainty and ambiguity of the problem.

44. Given the complexity of fire risk it is necessary to involve regulatory bodies, industry experts, scientists, and researchers to maximize the scientific knowledge of the risk and mitigation options. Innovation should be transdisciplinary. Policy making and planning, as well as the decision-making process, shall be based on sound and multidisciplinary scientific knowledge, taking stock of technological capabilities and recent innovation. This should, also, try to revive traditional uses of fire under safer conditions and foster benign land-use practices.

45. Local communities, indigenous groups, non-government organizations and local governments with less financial or political power are not adequately given the necessary inclusion and authority in decision-making processes. Therefore, planning for risk reduction measures should be identified in participatory procedures, such as round tables with all stakeholders, which allow discussion and negotiation at the correspondent jurisdictional levels.

46. Public policies and governmental actions should include the engagement of different policy sectors, such as, but not limited to, forestry, rural development, agriculture, spatial planning, civil protection, environment, and energy.

Systemic and Public Communication

47. Building on risk and risk perception assessments, clear communication strategies are to be envisaged on all stages of the landscape fire processes. For this purpose, the sharing of risk data, information, and knowledge among the relevant stakeholders is a key process to develop a common understanding of the tasks and responsibilities of land and fire managers – communicating within the IFM system – as well as a better understanding of risk and its management – communicating to the general public.

48. The strategies towards better adapted attitudes to risk should consider the different causes of wildfires, the population targets, and their risk perceptions, with the identification of the most effective communication and engaging tools in each regional level. The perception of the likelihood of low probability / high impact events poses an additional challenge to adequate fire risk perception and should therefore be addressed as highly important in the communication strategy.

49. The performance of the communication process should be measured. Periodically surveying the population reached, shall allow for detecting changes in risk perception, but this measuring should also cover key impact indicators such as the evolution of the number of fires and its causes, which will show how effective is the communication process.

50. Given the leading role of the media in shaping risk perception, it is crucial to develop clear strategies to effectively engage the media as partners in this process.

51. It is important to clearly communicate what the challenges are and what deliberations are asked for, just as what their expected outcomes should be, for all stakeholders to have a full view on what they are deciding upon, thus strengthening their commitment.

International cooperation

52. The principles for stakeholder engagement do not apply exclusively to domestic decision making. International cooperation should also look for holistic views and long-term commitments, bringing together the best countries and organizations have on the many sciences and areas of expertise dealing with landscape fires.

53. International qualification and training programmes and courses, widely accepted and following agreed upon standards, are beneficial for fostering effectiveness and efficiency of cross-border cooperation, preparing neighbouring countries and further ones alike for assistance and facilitation of foreign resource use.

54. International platforms aiming to share the scientific developments and fire knowledge should deserve additional investment, avoiding duplication of research, simple access to global information and promoting innovation.

55. International mechanisms (e.g., hubs, joint agencies, or dedicated offices), that can assure the cross-sectoral approach for the wildfire risk management should be encouraged by national governments and international institutions, looking for synergies among existing mechanisms.

Data sharing between countries should be strengthened, particularly between neighbouring countries, aiding in programming joint flammable fuel management operations.

Governance Bodies

56. Adapting the national strategy and planning for wildfire management, intermediate bodies, overarching in scope and politically empowered, should be created, including entities that may include representatives from:

    a. Political representatives;
    b. Forest authorities;
    c. Civil protection authorities;
    d. Environmental agencies;
    e. Rural development agencies;
    f. Security and law enforcing agencies;
    g. Scientific community;
    h. Local community:
    i. Non-governmental organizations;
    j. Other sectoral policy stakeholders.

57. Under such overarching bodies, the decision process would acknowledge the fact that risk in the context of fire management is a complex equation demanding solid governance, only achievable through involvement of all relevant stakeholders. This should help improve risk assessment and evaluation, involving all relevant parties in the deliberation process.

Moving Forward

58. The framework invites governments, public and private stakeholders, to define a set of indicators to measure the progress of integrated landscape fire management at their specific levels of intervention, primarily focusing on outcomes and the level of implementation of the guiding principles. Sharing information under well documented data models is welcomed, allowing for better integration of IFM planning, modelling and response software tools.

59. The Conference invites governments to adopt policies that promote Integrated Landscape Fire Management by (i) bridging different government areas under an overarching governance body or other inter-ministerial arrangements that help to close the policy and institutional gap and foster cross-agency and cross-sectoral dialogue, coordination, and IFM value chain monitoring, (ii) considering translating this legally non-binding framework into their own national policies, and (iii) joining efforts to strengthen networks and thematic resource centres at the international level, where the state of the art, future work and innovation can be shared among policy and decision makers and with the broader community of practitioners.

60. The Conference supports the establishment of a United Nations (UN) mechanism to promote the implementation of a global integrated fire management programme that could have a key role in: (i) strengthening the international cooperation in integrated fire management; (ii) promoting a holistic approach to integrated fire management; (iii) facilitating the free and open global transfer of knowledge; (iv) supporting the governments to follow what states item 59; (v) searching for and developing an instrument for funding integrated fire management actions globally.

Annexes

Integrated Fire Management Value Chain Prerequisites

A. The planning stage of the IFM value chain has, as main prerequisites (but not limited to):

   a. Participatory assessment of the cultural and social context of fire, the socio-economic necessities, and impacts. Why people are burning, who is burning, why they are burning the way they do, what are the local knowledge on fire management, people are burning too much or not enough (connected with the understanding of the ecological role of fire), how people are affected by fires, and which are the negative impacts that fire can have on society.

   b. Existence of information to support planning decisions: Maps (vegetation, topography, tenure, assets roads, ignition distribution, etc.), fire behaviour prediction tools, spatial databases, demographic information, cultural & social context of fire, ecological response to fire (fire histories, fire effects information, fire regimes);

   c. Development of a public policy and implementation strategy, in which explicit incorporation of risk assessment, risk evaluation and prevention measures agreed with stakeholders is prioritized and sufficiently financed;

   d. Development of plans at the relevant territorial levels, assuring broad participation of a bottom-up process with national coherence, identifying goals, actions, responsibilities, targets, and budget.

B. The preparation stage of the IFM value chain has, as main prerequisites (but not limited to):

   a. To reduce ignitions:

      i. Education programmes regarding basics of landscape fire, environmental impacts, and fire use;

      ii. Development and enforcement of laws and regulations concerning the use of fire, including clear rules for burning permit systems;

      iii. Communication campaigns addressing all population groups about the advantages and disadvantages of fire use in general, and reduction of unplanned accidental fires.

      iv. Promotion of low-cost sustainable techniques as an alternative to burning in rural production activities when the use of fire generates more negative than positive outputs.

   b. To better protect

      i. Implementation of community engagement programmes in fire prone rural villages and farmsteads, preferably incorporating nature-based solutions with economic added value;

ii. Systemic risk communication to prepare populations, addressing in a specific way different target groups such as scholars, rural population, wildland-urban interface population, tourists, and general population.

C. The prevention stage of the IFM value chain has, as main prerequisites (but not limited to):

a. Legislation that regulates forestry and biodiversity management should consider, promote and regulate the use of prescribed burning, agricultural, traditional fires, and grazing. It should also consider other fuel management programmes that determine the scale and location of mosaics and fuel breaks based in the appropriate analysis to identify strategic management areas, as well as landscape changes where needed;

b. Existence of building codes and vegetation management guidelines that reduce the vulnerability of buildings and encourages or mandates the use of defensible buffer space;

c. Procedures in place and adequately staffed for check safety conditions of structures and facilities, including evacuation plans and routes, shelters and places of refuge, and inspecting for compliance with prevention measures, flagging nonconformities that can later be checked for safety as described above.

D. The pre-suppression stage of the IFM value chain has, as main prerequisites (but not limited to):

a. Hazard, frequency, and exposure are measured, and potential loss evaluated according to different scenarios using actuarial information and probabilistic models.

b. Adequate detection and suppression capabilities are in place.

c. Resources are prepositioned, and surveillance resources cover the areas according to risk.

d. Effective early warning systems are in place and can reach all exposed population;

e. Communication channels are effective and are used by all the agents and agencies in a common system and provide geo-localization data of all units and personnel involved.

E. The suppression stage of the IFM value chain has, as main prerequisites (but not limited to):

a. Resources for suppression and relief operations are in place that meet the strategic objectives of an incident management plan, that is supervised, and physical and financial indicators monitored;

b. There is system that dispatch rapid response teams for fire suppression, and that are capable to adequately select and use a set of tools and techniques, to protect lives, natural resources, private and public assets, and critical infrastructures;

c. An incident command system is in place, and positions are staffed by qualified personnel, and mission is objective oriented;

d. Decision-support tools and operational management systems are in place;

e. Provision of fire spread information to the community, informing on the safest course of action.

F. The post-fire stage of the IFM value chain has, as main prerequisites (but not limited to):

a. Community welfare assistance is in place;

b. Emergency actions regarding potential erosion and invasive species are identified and preventive action undertaken ahead of rain and mitigated during the following winter or rain season;

c. Actions towards economic loss reduction (e.g., salvage logging and replanting, infrastructure repair);

d. Environmental rehabilitation and restoration of biodiversity, ecological habitats, and landscapes, including natural regeneration and considering biodiversity and ecosystem functions needed for sustainable post-fire management;

e. Assess the need to rebuild, and if necessary, repair and restore according to "build-back-better" principles, namely construction of wildfire-safe houses and infrastructures;

f. Leaders and crew personal participate in debriefings; research gaps are identified, accidents and incidents are investigated, analysed and lessons identified, and its implementation prioritized, thus being shared as lesson learnt;

g. Fire causes and motivations should be investigated by trained personal, information is collected, analysed, shared, and used to define prevention policies, in areas such as education, awareness, and surveillance.

Reference papers

This framework inherits and builds upon much of the work made for, and in consequence of, the past International Wildland Fire Conferences. The key references can be read at the links given below.

White paper on vegetation fires and global change. Challenges for concerted international action. A white paper directed to the United Nations and international organizations (2013) – https://gfmc.online/wp-content/uploads/Vegetation-Fires-Global-Change-UN-White-Paper-GFMC-2013.pdf

Thirty Years International Wildland Fire Conferences: Review and achievements of a circumglobal journey from Boston to Campo Grande (2021) – https://gfmc.online/wp-content/uploads/GFMC-IWFC-7-Review-30-Years-Int-Cooperation-Fire-Management-Biodiversidade-Brasileira-11-2-2021.pdf

Campo Grande Statement (2019) – https://gfmc.online/wp-content/uploads/IWFC-7-Statement.pdf

Pyeongchang Declaration (2015) – https://gfmc.online/iwfc/korea-2015/IWFC-6-Conference-Declaration.pdf

Fire Management: Voluntary Guidelines – Principles and strategic actions (2006) - https://www.fao.org/3/j9255e/j9255e00.htm

Inquiries and attribution

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In tandem with the preparation of the 8th International Wildland Fire Conference, held in Porto, Portugal, from May 15th-19th, 2023, the *Landscape Fire Governance Framework* was written by the Portuguese Agency for Integrated Rural Fire Management (AGIF – Agência para a Gestão Integrada de Fogos Rurais) with the participation of João Carlos Verde (AGIF), Mário Monteiro (AGIF), Peter Moore (FAO Advisor) and Catherine Gamper (OECD). Contributions from Johann Goldammer (GFMC) were used in the text. Initial text revision by Gordon Sachs (USFS). Many thanks to all International Liaison Committee members and other contributors to the final text.

Terminology

The international use of the fire management terms (English) is not consent-based and is often inconsistent. Some key terms used in this document aim at distinguishing between overarching terms such as (i) Landscape Fire and Wildland Fire (general terms, synonymous with vegetation fire); (ii) Wildfire (unplanned and uncontrolled fires – the prevailing threat to the environment and society – the risk of which can be reduced by adequate governance); (iii) Prescribed Burning (the targeted application of fire in sustainable land management); and (iv) Fire Management and Integrated Fire Management (overarching terms for a system that requires adequate governance to [a] reduce the negative impacts of landscape fires on the environment and society, and [b] advance the knowledge and application of the ecologically and environmentally benign role of natural fire in fire-dependent ecosystems, and sustainable application of fire in land-use systems.

Landscape Fire

A fire burning in vegetation of natural and cultural landscapes, e.g., natural and planted forest, organic terrain (such as peatlands), shrub, grass, pastures, agricultural lands, and peri-urban areas, regardless of ignition sources, damages, or benefits.

Wildland Fire

Any fire occurring on wildland (= "vegetated and non-vegetated land in which development is essentially non-existent") regardless of ignition sources, damages, or benefits.

Wildfire

Any unplanned or uncontrolled fire burning in vegetation of natural, cultural, industrial, and residential landscapes, which regardless of ignition source (i) may require suppression response, or (ii) other action according to agency policy, e.g., allowing the fire to freely burn as long as it meets land management objectives.

Prescribed Burning

Controlled application of fire to vegetation under specified environmental conditions, which allow the containment of a fire to a predetermined area and at the same time to produce the intensity of heat and rate of spread required to attain planned resource management objectives. Traditional / indigenous practices, which are based on inherited experience rather than on advanced fire ecology science, are called controlled burning.

Fire Management

All activities required for the protection of forests and other vegetation from wildfire, and the use of fire to meet land management goals. It involves the strategic integration of knowledge – on fire regimes, probable fire effects, values at risk, level of forest protection required, cost of fire-related activities, and prescribed fire technology – into multiple-use planning, decision making, and day-to-day activities to accomplish stated resource management objectives. Successful fire management depends on effective fire prevention, detection, pre-suppression, and control, having an adequate fire suppression capability, and consideration of fire ecology and human relationships.

Integrated Fire Management

A fire management system that includes one or both of the following concepts: (1) integration of prescribed natural or human-caused wildfires and/or planned application of fire in forestry and other land uses in accordance with the objectives of prescribed burning; and/or (2) integration of fire management activities and use of the capabilities of rural communities/land users to meet land management objectives.