United Nations
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Global Fire Monitoring
Center (GFMC)

UNECE / FAO Team of Specialists
on Forest Fire

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UNISDR Wildland Fire Advisory Group / Global Wildland Fire Network
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Post-Forum Evaluation of the Preparatory Enquiry / Questionnaire

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Introduction

In preparation of the UNECE / FAO Regional Forum on Cross-boundary Fire Management a questionnaire was developed by the Global Fire Monitoring Center (GFMC) and distributed to the UNECE Member States.

The aim of the questionnaire is to provide background information / data for the discussions at the Forum. Members of the UNECE/FAO team of Specialists on Forest Fire, and other voluntary contributors from UNECE Member States, and authorities of the Member States have been asked to fill the form before the Forum.

It turned out, however, that UNECE Member States suggested to provide more time for collecting the information needed for the enquiry. Thus, the evaluation of the questionnaire had been postponed to the time immediately before, and particularly following up the Forum in 2014.

The questionnaire may be obtained from GFMC upon request. The size of the questionnaire is 37 pages (in English and Russian).

Introduction to the Analysis

In the lead-up to the UNECE / FAO Regional Forum on Cross-boundary Fire Management held in Geneva, November 2013, a preparatory questionnaire was circulated to all UNECE member states by the Global Fire Monitoring Center (GFMC) and the UNECE/FAO Team of Specialists on Forest Fire with the aim of collating background information and data on the scale of wildfire problems as well as the challenges, approaches and attitudes to holistic wildland fire management in the UNECE region. The questionnaire was made available in Russian language where appropriate, but other UN languages of the region were deemed unnecessary because it was known that the nominated national expert from these countries (France and Spain) were more than adequately equipped with the English language.

Circulation of the questionnaire prior to the Forum helped prepare the participants for the range of topics that would be discussed in Geneva and encouraged them to delve into aspects of wildland fire management normally outside of their immediate domain to bring a broader perspective of domestic fire management to the UNECE/FAO table.

While filling the questionnaire must have been a challenging task requiring substantial research and effort in explaining the intricacies of domestic wildland fire management, the depth of the responses received has provided insight which has been very much appreciated.

The analysis of the questionnaire has been assisted by considerable background understanding of the wildland fire issues facing the region provided by the GFMC. Considering this, responses to the questionnaire were received with an open mind to ensure they were not moulded to pre-existing interpretations. The author trusts that an accurate portrayal of the real situation is presented and would welcome any corrections or further detail that can be provided in the course of future discussions. It is hoped that the analysis and presentation of the responses to the questionnaire assists in developing a deeper understanding of the nature and management of wildland fire at the regional, and in some ways, the global scale.

Executive Summary

Section I – Fire-prone lands, wildfire occurrence and wildfire damages
Wildfires were reported to occur in all responding countries, although for the most part only data relating to forests was available. Notably, the Former Yugoslav Republic of Macedonia reported the highest proportion of forested land affected annually by wildfire, at around 1%.

Section II – National coordinated or coherent fire management policies or strategies
The majority of respondents, conspicuously those representing post-soviet and post-socialist countries, report that fire management policies in their countries are concentrated at the national level

and enacted across the nation through local branches of these national agencies. In contrast, fire management policies in Spain, Canada, Switzerland and Germany are the responsibility of provincial government authorities. In most of these cases, particularly in Canada, adequate cooperative measures are in place to harmonise practices that otherwise may cause conflict or inefficiencies.

Section III – Institutional and Sectoral responsibilities in fire management
A common theme running through the detailed responses on this topic is that the concerned agencies and sectors undertake wildland fire management activities in some degree of isolation from one another. In particular, preventative action is disconnected from suppression responsibility. The highest degree of inter-sectoral coordination exists in relation to suppression activities. A number of respondents report that an annual inter-agency meeting is conducted to assist with this. The Agriculture sector is strikingly absent in almost all discussions of agency and sector responsibility.

Section IV – Use of prescribed fire
Prescribed burning related to hazard reduction is common in Canada and becoming more widespread in Spain, Germany, Belarus and the Russian Federation. In Germany, in particular, ecological considerations are considered central to prescribed burning activity. Other controlled fire is used in a number of other countries for various purposes, including clearing of roadsides, logging slash and crop residue and rubbish burning. Agricultural burning is very common in the responding countries despite being almost universally banned. The legal and financial factors that compel farmers to undertake burning in contravention to such bans should be examined if these fires are considered a problem.

Section V – Abandoned agriculture and pasture lands
Abandonment of agricultural lands and associated demographic trends such as population decline and 'aging' rural communities are commonly described phenomena in the Eurasian responses to the questionnaire. In western European countries this has occurred gradually over the past several decades as the agricultural industry has been transformed by machinery and technology. In some of these cases there is concerted effort to stem the trend by recognising the range of values, including ecological, held by cultural landscapes. In the eastern European and Eurasian examples, abandonment has occurred in a dramatic fashion since the collapse of socialist unions, resulting in uncontrolled abandonment and depopulation in rural areas. The heightened threat due to the combination of increasing fuel loads and fuel connectivity as well as the compromised capacity to deal with wildfire when it happens is keenly felt across the region.

Section VI – Fire emissions and human health and security
Smoke emissions from wildland fire is widely recognised as a great potential threat to human health and security, particularly in Greece, Ukraine and the Russian Federation following damaging smoke and haze events in recent years. Despite this, no specific actions beyond 'possible emergency response and evacuations' are widespread. The exception to this generalisation can be found in the Russian response to the 2010 wildfires. In this case, improved plume forecasting methods and tailored emergency civil protection measures have been focussed upon as a result.

Section VII – Fire emissions and environmental impact
Consideration of the environmental impact of wildland fire emissions takes the primary form of Carbon Dioxide (CO_2) monitoring programmes undertaken in Switzerland, Germany, Canada and Georgia and secondarily the estimation of Black Carbon (BC) emissions' estimates from Canada, Ukraine and the Russian Federation. In other cases, emissions from trash burning are the most similar target for air quality monitoring and legislation.

Section VIII – Economic impact of wildfires
In a reflection of the response to Section I of this questionnaire, the measured economic impact of wildfires reported by the correspondents is dominated by estimates of timber losses based on the volume of timber lost to fires. Occasional estimates of agricultural losses and the destruction of houses are included and in the Greek example, an attempt to quantify the overall economic impact of the devastating 2007 fires is made. An observable trend of quantifying only particularly dramatic events is present, which may have the effect of overlooking more regular, but less dramatic wildfire losses.

Section IX – Human casualties
Firefighter casualties largely outweigh civilian casualties in all reports with the exception of Greece, where heavy civilian losses during the 2007 wildfires tip the balance dramatically the other way. The data is too sparse to draw any causal relationships, but the relatively high regard for civilian well-being over that of firefighters may be a contributing factor. The elephant in the room in this case is the issue of including smoke inhalation casualties in the overall toll of wildland fires. The most telling example of this conundrum is evident in the Russian response, where tens of thousands of extra-ordinary deaths recorded during the 2010 smoke and heat episodes are not considered wildfire casualties due to lack of clear evidence indicating the relative impacts of heat and smoke.

Section X – Specific contamination issues – radiation, UXO and other
Apart from the common concern of uncontrolled rubbish landfills, the presence of Unexploded Ordnance (UXO), land mines and radiation contamination is becoming widely recognised as compounding the threat posed by wildland fire. Contamination resulting from accidents (Ukraine), conflict (east Mediterranean region) and military training (Germany) hinders preventative fuel management and endangers firefighters and the wider population when fire occurs. Sadly, casualties still occur where civilians and firefighters venture into these areas. On the other hand, improving the mapping of contamination and gaining a better understanding of how to manage this land for ecological, fire prevention and safety gains are current initiatives in the responding countries.

Section XI – Transboundary / cross-border fires
Wildfires crossing international borders are widely recognised and observed throughout the UNECE region. Beyond this, smoke impacts from major events such as the 2010 Russia fires have also been mentioned.

Section XII – Bilateral of regional agreements – information, SOPs, resource-sharing
Wildfire-specific cooperative arrangements between local fire authorities either side of international borders are common and frequently enacted. Beyond this, *ad hoc* international assistance occurs quite often when a country calls upon others to assist with extraordinary situations. Long-standing, sub-regional agreements teaming historic allies exist in the Balkan region and the former Soviet Union, and the European Union is in the process of forming such an allegiance presently. Long-standing relationships with distant partners are favoured by some member states to take advantage of disparate fire seasons and common experience and language.

Use of the Incident Command System (ICS) contributes to the foundation of some effective international agreements. Recognition of this advantage has spurred other countries to encourage its development and dissemination domestically.

Section XIII – Specialised training and personnel
Firefighters dedicated primarily to dealing with wildland fires exist in only a small number of responding countries. In most cases emergency responders are given a degree of specialised wildland fire training to complement their primary roles as civil protectors, urban firefighters or military. A small number of countries report that the personnel expected to suppress vegetation fires are basically untrained and lacking in the skills and special equipment required.

The active participation of women is forbidden in some responding countries, limited to support roles in others and enthusiastically welcomed in a third group.

International sharing of training and expertise is occurring amongst some partners in the region, and enthusiasm for a more formal, regional programme of this kind is high.

Section XIV – Volunteer firefighters
Volunteer firefighting organisations exist in most responding countries, but the regulation, training, compatibility with professional brigades and the nature of legal and financial protection vary widely.

Section XV – Participation of civil society
Civil society is most commonly ‘involved’ in wildland fire management purely as an audience to which warnings about accidental fire ignition are played. However, a small number of respondents describe a situation in their country where civilians are expected to play an active role in protecting themselves

and their communities from the threat of wildfire. Chief among these is clearly Canada, which provides information and advice to individuals and rural communities.

Section XVI – Use of advanced data and information systems with a focus on fire management
All countries calculate daily fire danger based on hydro-meteorological inputs during the declared fire season. Most also make mid- and long-term forecasts of the likely severity of future seasons using advanced satellite data and climate models.

Section XVII – Fire research with application in management
Most correspondents report that research into wildland fire and its management is being undertaken at the national level, led by either the forest industry or university faculties focussing on fire, forests, the atmosphere and natural disaster management. In some instances fundamental fire behaviour and ecology are emphasised and in others, 'human' factors such as settlement patterns, human use of fire and the response of society to emergencies are added to enhance the relevance of fire science to society.

Section I – Fire-prone lands, wildfire occurrence and wildfire damages

In reporting the prevalence of wildland fire, all countries report that such fires occur and cause damages in their territory. The figure most commonly mentioned is the area of forested land annually affected by fire, which in most cases ranges from 0.1% to 0.5% of all forested lands in the country. The highest proportional figure mentioned is that of FYR Macedonia, which reports around 1% of forested lands impacted by fire each year.

Outside of forests, few countries report that fires occur on other categories of land, and of these even fewer report the actual area affected. Albania, Croatia and Greece report substantial areas of agricultural land affected by fire each year and Belarus and Croatia report that areas of peatland and shrubland are burned every year.

The results reported by correspondents indicate that wildland fire is a universal problem. However, it would be reasonable to suggest that the countries indicated have self-selected by the fact that their representatives have taken the trouble to respond to the questionnaire. It cannot be assumed that all countries in the UNECE region experience the same level of damages or threat from wildland fire as those that responded to the questionnaire.

Despite this limitation, an important insight that can be gained from the responses to the questionnaire is that wildland fires occurring outside forests are not adequately recorded or considered by the relevant authorities. The fact that the area of non-forested lands impacted by fire is not available indicates that wildland fire is widely considered to be only a 'forest' problem and not a 'landscape' problem. Examples in Table 1 from Belarus, Croatia, Greece and Ukraine are illustrative of this assessment.

The fallacy of this approach to wildland fire is highlighted by the fact that, in some cases, both the gross area and 'proportion by type' of some non-forest affected by fire exceeds the values of 'forest' that has been affected by fire. From these figures it seems logical that the matter of wildland fire should not simply be identified as a threat to forests. Comprehensive reporting of wildland fire incidence and damages is an important first step in this direction.

This theme of the non-forest extent of wildland fire receiving poor recognition is supported by the responses received for Sections II, III, V and VIII of the questionnaire.

Table 1. The area of various land cover types was reported for the responding countries. In most cases the average is reported for the years 2000 – 2011, although in some cases a longer or shorter time span was reported. Where the total area of each land cover type was available the burned area has been presented as a percentage of this total. The numerous gaps indicate that burned area for these areas was not reported because it did not occur, was not recorded, or the country representative was not able to access the information.

Country		Burned Area (annual average (ha / % of that land-use type))				
	Forest	*Agriculture and Pasture*	*Orchard (Olive/Fruit)*	*Shrubland*	*Peatland/ Wetland*	*Protected area*
Albania	2700ha / 0.2%	2000ha / 0.4%	200ha			
Armenia	195ha / <0.1%					27ha
Belarus	905ha / <0.1%			1671ha		
Canada	2.2mil ha / 0.5%					
Croatia	6600ha / 0.2%	22900ha			7856ha	
Georgia	310ha / <0.1%					
Germany	481ha / <0.1%					
Greece	12416ha / 0.4%	17899ha / 0.4%		16257ha / 0.5%	912ha / 0.9%	
Kazakhstan	41802ha / 0.1%					
Lithuania	290ha / <0.1%					
Macedonia	10344ha / 1%					
Poland	996ha / <0.1%					
Russia	2mil ha / 0.2%					
Serbia	2828ha / 0.1%					
Spain	113847ha / 0.4%					
Switzerland	16ha / <0.1%					
Turkey						
Ukraine	4000ha / <0.1%	132545ha / 0.3%				2000ha

Section II – National coordinated or coherent fire management policies or strategies

The nature of wildland fire dictates that its direct management – from prevention, through preparedness, to suppression – must be undertaken at the very local level. Land must be managed for prevention by individual foresters and farmers, and firefighters must be ready to respond quickly to fires that are nearby. However, this local organisation must be part of a broader, landscape-scale strategy to reduce the damaging potential of fire in the environment. This must be expressed in the land management and emergency response policies that oblige various agencies and sectors to manage aspects of wildland fire.

Examples of these policies include the extent and limitations of the duties of various agencies to manage the landscape for prevention of wildland fire (i.e. Forestry, Agriculture etc.), including fuel management, preventing intentional and accidental ignitions and managing public access. At the other end, these policies should also prescribe responsibility for various aspects of wildfire response. For example, which agency is responsible for initial response (this may vary with land ownership) and how do other agencies (i.e. Metropolitan Fire Service, Emergency Service and Military) become involved and cooperate effectively?

In most of the examples provided in the responses to the questionnaire, the bulk of fire-related policy exists at the national level and is implemented by local branches of national bodies (emergency services, forest service etc.) according to national standards. Most countries falling into this category appear to have inherited this centralised system from their Soviet and Socialist forebears.

On the other hand, a small number of countries require a lower jurisdictional level of government to determine policies within their own borders within the bounds of broad-sweeping national laws. The best examples of this are Canada and Spain, where the Provinces and Comunidads are highly autonomous in many ways, including their land management and emergency service organisation. As a result of this the forest management, land management and most emergency service agencies are based at the Province / Comunidad level.

A rudimentary grouping of responding countries' approach to wildland fire policy is presented in Table 2. While there are perceived advantages and disadvantages of each system, those specifically apparent in the responses to the questionnaire can be summarized as such:

Centralised policy theoretically allows quick implementation across the entire country of new or changing policies and provides nation-wide uniformity in the operations of that particular agency. This is particularly effective where the country and its institutions are small (e.g. FYR Macedonia) but less-so when these standards need to be set throughout massive organizations such as the Russian Aerial Forest Protection Service (Avialesookhrana). Centralized policy also limits confusion between bordering Provinces and Oblasts when they are required to cooperate in border-crossing fires or assist in large emergencies in another part of the country.

Countries depending on dispersed fire management policies claim the advantage that localised governance allows each jurisdiction to better cope with the specific wildland fire conditions they are likely to experience. Under such a system, effective cooperation at the national level requires much more intensive organisation between the equivalent agencies of the different Provinces. The example from Spain is particularly illustrative, in that the training for firefighters and even the emergency management systems vary from one Comunidad to the next. However, according to the expert response, this challenge has been met by effective communication and collaboration between Comunidad governments and fire management agencies as well as a number of national agencies.
Where Spain, Germany and Switzerland have systems in place to make up for the potential shortcomings of dispersed fire management policy, Canada has taken this same idea several steps further by establishing a national body with the express purpose of facilitating exchange of firefighting resources between the fire suppression agencies of the Provinces and Territories. The Canadian Interagency Forest Fire Centre (CIFCC) has been operating since 1982 to provide this service nationwide.

Beyond this, in recent years Canada has begun to implement fire management activities according to the Canadian Wildland Fire Strategy, which is the nearest thing to a National Fire Management Plan reported by any of the responding countries. This Strategy encompasses all stages of the fire management process across sectors and jurisdictions, including research, land management, fire prevention, community engagement and resilience and fire suppression. In establishing such a clear set of national-level outcomes, the Provincial governments of Canada and their fire management agencies are able to plan their activities in a harmonious way.

Table 2. Based on the responses to the questionnaire, the approach to Wildland Fire Policies adopted in various UNECE countries can be broadly grouped into two categories.

Generalised approach to Wildland Fire Policy	Country
Wildland Fire Policies exist primarily at the **National** level with implementation by local branches of national bodies	Albania, Armenia, Belarus, Georgia, Greece, FYR Macedonia, Kazakhstan, Russian Federation, Serbia, Ukraine
Wildland Fire Policies exist primarily at the **Province/Canton/Comunidad** level with inter-governmental cooperation facilitated by provincial and national bodies and over-arching laws	Canada Spain Switzerland Germany

Section III – Institutional and Sectoral responsibilities in fire management

The questions posed in Section III of the questionnaire were aimed at evaluating the Sectoral approach to wildland fire management in the UNECE region. The nature of wildland fire and the measures required to manage it mean that multiple government and private sectors must be involved in at least some stage of the process. For example, Prevention of wildland fire should be coordinated at least with the Forestry, Agriculture and Conservation Sectors. Preparedness and Response should include these land management agencies plus all emergency responders as well as the general public and property owners and managers. Beyond this, Sectoral interests will be held by agencies and organisations working in Health, Insurance, Town planning and Climate change.

The most usual approach described in the responses to the questionnaire portray a situation where sectoral interests manage 'their' aspect of wildland fire separately aside from attempts to coordinate the emergency response to wildfire situations.

A typical example of this would be that the Forestry agency manages preventative actions in their forests such as cutting fuel breaks and conducting controlled hazard reduction burns and is responsible for detection of and first response to fires in the forests they manage. Prevention duties in non-forested lands are the responsibility of the agency or person directly managing that land – be it the National Parks' agency, a private company or an individual farmer.

Suppression duties largely fall to some kind of Emergency Services' agency which must coordinate the response to the fire including escalating the response to include other agencies in the case of large fires. The number of responding agencies included may raise to six, with various Emergency Agencies, the Military and Police all receiving mention at some point.

This general approach is exemplified by Georgia, Germany, Greece, Kazakhstan, Lithuania, Serbia, Poland and Ukraine. These countries, among others, also subscribe to another common approach to coordinating the inter-sectoral response to wildland fire. In these cases an annual meeting designed to organise emergency response procedures and responsibilities is conducted at the local level to ensure that matters such as communications and incident management do not become dysfunctional during emergency situations.

Toward the borders of this general theme a number of examples exist in which the allocation of responsibility is particularly weighted toward a certain sector or agency. For example, the Forest Services of Greece and Armenia do not play any role in fire suppression, as that is considered the exclusive realm of Emergency and Fire Services. On the other hand, the Forest Service of Turkey is allocated the entire responsibility for fire on its lands – from prevention to suppression and recovery.
A notable absence from any country's description of its fire management approach is the Agricultural sector. It is widely understood, and supported by the responses to Section I of the questionnaire, that intentional and accidental fires in agricultural landscapes are very common and often spread to other areas. It therefore counters logic for the Agricultural sector to remain unrepresented in the management of fire in the environment.

Section IV – Use of prescribed fire

Controlled vegetation fire is used to serve a wide variety of purposes where the reduction of the vegetative mass on an area is desirable to help achieve overall land management goals. In forests, prescribed burning may be carried out to reduce future fire hazard. In pastures it may be used to dispose of dead grass to allow new growth. In cropland it may be used to exterminate pests and next to roads fire may be used to improve visibility for drivers.

In keeping with scientific developments of the last few decades, some countries are recognising the ecological and hazard reduction (HR) values of lighting controlled fires in forests. Chief among the examples detailed in the responses to the questionnaire is Canada, where HR burning is an integral component of forest management and the Wildland Fire Management Strategy. Responses from Spain, Germany, Belarus and the Russian Federation indicate that prescribed burning in forests is receiving an increasing amount of attention as a component of responsible forest and fire management.

Beyond that, controlled fire is used for a variety of purposes in Albania, Croatia, Kazakhstan and FYR Macedonia. These purposes include the clearing of roadsides, clearing of logging slash and crop residue and domestic rubbish burning. In some instances these practices stem from traditional uses and in others, such as Germany, burning of heath ecosystems and historic vineyard landscapes is undertaken to restore historic burning regimes, imitate former disturbance regimes and maintain the ecological and cultural values of the landscape. Most prescribed burning in Germany is conducted to maintain high-conservation value ecosystems including registered FFH (Flora-Fauna-Habitat) sites.

Agricultural burning

One particularly contentious form of burning in open space is that of applying fire to agricultural fields in order to rejuvenate pasture, exterminate pests or to clear the way for future crops. Most countries impose an outright ban on such burning, not distinguishing it from arson or other criminal activity. At face value this is a comprehensible stance because many (perhaps the majority) of problematic wildland fires are ignited in the agricultural domain and most of these fires are suspected to be intentional management burns. The countries that mention a ban on agricultural burning are Croatia, Greece, Georgia, Kazakhstan, Poland, the Russian Federation, Serbia, Switzerland, Turkey, Lithuania and Ukraine. Conditional exemptions from a general prohibition of fire use in any type of vegetated land are possible in most States (Laender) of Germany.

Despite this blanket ban, all respondents except Poland, Switzerland and Lithuania also report that these laws are routinely ignored and fire in agricultural fields is prevalent. However, convictions of perpetrators are uncommon because there is rarely proof that a specific person lit the fire and it may be difficult to establish whether the person whose land is affected is the victim or the beneficiary.
The fact that the use of fire in the agricultural realm is so attractive that farmers are willing to break the law to treat their fields indicates that these kinds of laws may be in need of review along with the other legal and financial influences on the agricultural community. From the responses to the questionnaire it is impossible to determine the motivation(s) influencing an individual's decision to light up their fields. Possible causes may include the absence of economically viable alternatives such as ploughing crop residue into the soil or utilising the straw as an energy source, the difficulty or expense of obtaining permits to legally light fires or the perceived shortage of agricultural land prompting farmers to illegally clear other vegetation by burning.

Section V – Abandoned agriculture and pasture lands

Counter to the trend in some parts of the world which sees primary forest cleared to make way for agricultural land and development, large parts of the UNECE region are experiencing a decrease in the area of agricultural land as fields are abandoned by their former occupants. This is associated with a trend of rural communities 'aging' as young people turn away from the rural lifestyle for the perception of better opportunities in urban areas or abroad.

The impact of these trends on the nature of wildland fire in rural areas is manifested as an overall heightened threat to the remaining population, settlements and resources in these areas. The combination of factors that leads to this increased threat is that the increasing fuel load on abandoned fields results in greater connectedness of highly flammable lands and encroachment on remaining settlements. To further compound this problem, an aging, declining and dispersing population in these areas reduces the capability of these communities to prepare themselves for, or defend themselves against the threat of uncontrolled fire.

This phenomenon is widely represented in the responses given to the questionnaire. In fact only Canada, Belarus and Georgia report that agricultural abandonment and associated trends are not occurring and it is apparently unknown whether this is occurring in Croatia. All other representatives report that agricultural abandonment is widespread but none were able to confirm that the scale of the problem is known or recorded at any level.

The range of impacts associated with agricultural abandonment in the UNECE region can be seen as a story of two waves, depending on the country and the history of the specific case. In Greece, Turkey, Spain and Switzerland, abandonment has been a major cause of landscape change linked to efficiency gains in the agricultural industry over the past 60 to 70 years. On the other hand, the collapse of the communist systems in Albania, Armenia, Kazakhstan, FYR Macedonia, Serbia, Ukraine and the Russian Federation has led to a much more rapid pattern of land abandonment since 1990. The case of Germany displays characteristics of both waves due to its unique history.

It should be noted that some of the high-value conservation areas in Europe are biodiversity-rich cultural ecosystems. Abandonment of land cultivation in many ecosystem types leads to ecological succession, encroachment of trees and forest formation. This eventually results in loss of open-land habitats with their characteristic flora and fauna, including endangered (red-list) species. In such situations prescribed fire is increasingly used to restore historic fire and disturbance regimes, or to substitute other historic land-use methods of vegetation mass use or extraction (i.e. mowing and grazing).

Section VI – Fire emissions and human health and security

Wildland fire smoke is recognized in all the responding countries as the element of wildland fire that is most likely to have an adverse impact on human health. In most cases this is passively managed by allowing for an emergency situation to be declared and evacuations enforced when smoke impacts upon built-up areas. In these cases the smoke episode would be treated in the same way as any other environmental contaminant such as a chemical spill or smoke from a building or landfill fire. Air quality protection laws and punitive measures would apply accordingly if a perpetrator could be identified.

The level of concern is heightened in the countries of Greece, Ukraine and the Russian Federation due to recent damaging or potentially damaging experiences. The 2007 and 2010 experiences in Greece and Russia, respectively, highlighted the vulnerability of large cities (Athens and Moscow) to wildfire smoke episodes and their potential to severely compound the threat to human health and life posed by summer heatwave conditions. The same fires that impacted Moscow in August 2010 blanketed the Ukrainian capital of Kyiv, causing great, although false, public concern that the smoke may contain radioactive pollution from the Chornobyl exclusion zone.

Only in the Russian example is this heightened concern reported to have led to a more active approach to the management of wildland fire smoke as a specific threat requiring a specific response to protect the population. Improvements to smoke plume forecasting methods and emergency civil protection procedures tailored for episodes of smoke impacting upon urban areas are being undertaken as a response.

State legislation in the Laender of Germany, however, classifies and regulates vegetation fire emissions in a preventive way by forbidding burning of any vegetation type with the direct goal of protecting human health and security.

Section VII – Fire emissions and environmental impact

The consideration of wildland fire smoke as an environmental or atmospheric pollutant appears to be reasonably limited in the UNECE countries responding to the questionnaire. While most countries identify trash burning as the primary target of air quality protection laws (more for health purposes than environmental), a number of countries do attempt to monitor wildfire smoke emissions as part of their contribution toward atmospheric Carbon Dioxide (CO_2). These examples only extend to Switzerland, Germany, Canada and Georgia. In the case of Germany, the state-level laws referring to emissions are reported to be in line with Germany's commitment to the Gothenburg protocol of the UNECE Convention on Long-Range Transport of Air Pollution.

The emission of Black Carbon (BC) from wildfires is also monitored in Canada with relation to its impact on the atmosphere and research is being undertaken to better understand the impact that BC emissions from wildfires and agricultural burning in Ukraine and Russia may have on ice sheets in Arctic areas.

Section VIII – Economic impact of vegetation fires

In most of the responses received, the quantified economic impact of vegetation fires is limited to the direct losses of timber in impacted forests. This is especially the case in Serbia, Ukraine, the Russian Federation and FYR Macedonia. A summary of reported economic losses is presented in Table 3.

Beyond this, partially unquantified losses are reported in other sectors – particularly the loss of agricultural crops and fruit and olive orchards in Greece and Albania and the 'high cost' of operational shutdowns to the oil and gas industry in Canada. The cost of rehabilitating fire-affected lands to prevent mudslides and erosion is mentioned by the representatives of Albania, Georgia and Switzerland. The loss of houses – although not the summed economic impact – is also mentioned in Canada, Greece and Kazakhstan but not in other countries.

In terms of overall economic impact, only the example of the Greece fires of 2007 has been submitted as an attempt to quantify the overall impact of fire on the economy, and it is still unclear whether this assessment includes costs such as the cost of the emergency response, loss of productivity and ongoing costs such as the impact on regional tourism. All other submissions are much less detailed that the Greek response, so it would be reasonable to say that the overall economic impact of uncontrolled wildland fires in the responding countries is largely unknown.

In a reflection of other Sections of the questionnaire, the nature of the reporting of damages provides an insight into the approach to fire management employed in the various countries. The fact that most losses are reported in reference to catastrophic events indicates that no systematic reporting and recording of wildland fire losses is in place, but rather, losses are estimated on an *ad hoc* basis in the case of major fire events. The result of this may be that relatively minor events go unrecorded and the ever-present nature of wildland fire risk is underestimated.

Table 3. The nature and quantity of economic damages resulting directly from wildland fire show that again, forest and timber losses dominate the reported figures. Losses in other sectors, such as agriculture, or losses to the economy as a result of the response and evacuation effort are rarely reported.

Country	Reported Losses
Albania	Erosion and damages in orchards and agriculture
Canada	Shutdowns in the oil and gas sector are very costly. (Also, from Section I: Year 2003 – 334 homes + 45 000 evacuations, 2011 – 500 homes + 15 000 evac.
Georgia	Mudslides and erosion
Germany	1991-2012 – 2 million € timber losses, annual average
Greece	Year 2007 – total estimate of 5 billion € - olive trees (4.5 million), livestock (60 000), homes (3000). Wildland-Urban Interface damages are increasing with time. Mudslides occur in some regions
Kazakhstan	Year 2006 – 92 houses
FYR Macedonia	Timber – volume → value (m^3 x 1700 MK denar (28€))
Russian Federation	Timber losses – annual average – 10 billion roubles, 2010 – 100 billion roubles
Serbia	Timber losses – Year 2007 – 32 million €, Year 2012 – 113 million €
Switzerland	Erosion and mudslides
Turkey	Only few statistics available
Ukraine	Timber losses – Year 2011 – 300 000€, Year 2012 – 520 000 €

Section IX – Human casualties

In most of the individual country reports and as a total, the number of firefighter casualties largely outweighs the number of civilian casualties attributed to wildland fire events (Table 4). This trend is even more dramatic when the extraordinary case of Greece is considered separately.

It is difficult to draw any particular conclusions from the raw data provided. However, the lower number of civilian casualties may indicate that during wildfire events the emphasis of human protection is put on warning, evacuating and protecting civilian lives ahead of operational protection of firefighting professionals and volunteers. The example that counters the trend is Greece, which lost a large proportion of the recorded lives in the devastating 2007 fires. In relation to these fires, it is mentioned in Section XV of this questionnaire that inadequate warning of the population led to the high civilian toll. Thus the exception can be understood to confirm the rule.

It is unclear whether the reported figures include 'secondary' casualties resulting from impacts such as car accidents related to poor visibility or, more importantly, from smoke inhalation. It is assumed that the public health impact of smoke pollution, and therefore any estimate for the number of deaths that could be attributed to it, has not been included in the submitted reports. The figures submitted by the Russian Federation in Section VI of this questionnaire mention '50 000 deaths above the long-term average' that occurred during the intense period and heat and smoke haze that impacted Moscow in August 2010. However, there is no statistical or medical evidence confirming how many of these casualties could be directly attributed to smoke pollution and how many attributed to the extraordinary heat stress. A reasonable conclusion to draw from this data is that more attention should be paid to obtain more precise data during such heat and vegetation fire smog episodes.

Table 4. The number of casualties attributed to wildland fire in the responding countries. In most cases the number of firefighter casualties outweighs the number of civilian casualties. Premature deaths and injuries by vegetation fire smoke pollution are not included in this table.

		Fatalities		Injuries	
Country	**Period**	**Civilian**	**Firefighter**	**Civilian**	**Firefighter**
Albania	2003-2013		15		
Armenia	2011-2012				
Belarus		Occasional			
Canada			Occasional (aircraft)		
Croatia	2007-2012	3	12	11	
Georgia					
Germany	1975	1	5		
Greece	1977-2013	136	42		
Kazakhstan	2006-2013	2	9		
Lithuania	2012			2	
FYR Macedonia	2012	1	3	7	5
Poland	1992		2		
Russian Federation	2010-2013		19		
Serbia					
Spain	2001-2010	17	51	12	554
Switzerland					
Turkey	xxxx-2013	4	106		
Ukraine	2007-2012		2		6
Total Casualties		**164**	**266**	**32**	**565**

Section X – Specific contamination problems – radiation, UXO and other

The presence of contaminants in vegetated lands is an emerging field of concern for the management of wildland fires of all types. The negative potential of combustion and dispersal of contaminants poses a threat to the public and the environment over a wide area and a particularly dire threat to firefighters working in these contaminated areas. A number of countries' representatives mention uncontrolled landfills as a potential hazard if affected by fire, but these are considered within reasonable reach of control in the not-too-distant future.

Graver concern is expressed in relation to the broad-scale contamination of terrain from Unexploded Ordnance (UXO), land mines and radiation, and the reported areas affected by these contaminants is summarised in Table 5. These areas are a special concern in relation to wildland fire precisely because people have been unable to enter them to undertake management operations since the time of contamination. While this is widely recognized as having positive ecological influence, wildland fire in these regions poses quite specific threats. The concern for the population is that burning contaminants will be dispersed with the fire smoke. The concern for firefighters is that in the 'heat' of an emergency situation, they may intentionally or accidentally enter contaminated areas and put themselves at extreme danger.

Unexploded Ordnance and Land Mines

The history of the UNECE region has resulted in the contamination to this day of large areas with explosives resulting either directly from armed conflict or from military training in practice for armed conflict. As indicated in Figure 1, quite a number of countries report areas contaminated by unexploded ordnance such as mortars, grenades and other explosive projectiles. On top of this, several countries in the eastern Mediterranean region also report areas laid with landmines, particularly along current or former national borders. It is reported by the Albanian representative that injuries from landmines are common, including to firefighters in the line of duty. Although the dataset is far from complete, it seems that the more recent conflict in the Balkan region is that which continues to pose the most danger to firefighters and the public through the lethal legacy of land mines that have not been cleared.

The questionnaire responses from Germany, Greece and Serbia indicate that efforts are being made to protect firefighters by forbidding wildfire response within contaminated areas. Innovative solutions are being tested in Germany to simultaneously provide for the ecological integrity of these areas as well as the desire to control wildland fire in the areas and the necessity to protect firefighters. For example, in UXO-contaminated sites that have also been recognised for their ecological importance, the use of prescribed fire in combination with remote ignition techniques and the use of armoured, mechanised equipment and unmanned aerial monitoring systems is being actively pursued as a feasible management approach to ensure the protection of firefighters whilst returning heathlands to their ecologically-, culturally- and fire-secure state.

As well as these factors, the reporter for Serbia also refers to claims that shells containing depleted Uranium were used during the bombing of Serbian territory in the 1999, compounding the contamination of the area.

Radiation

The reported issue of radioactive contamination in the UNECE region is almost entirely confined to the area impacted by the April 1986 accident at the Chornobyl Nuclear Power Plant in northern Ukraine, as indicated in Figure 1. Being close to the corner between Belarus and the Russian Federation, these neighbours report respective areas of 1.5 million and 1 million hectares of contaminated terrain on top of the 2.2 million hectares reported by the Ukrainian rapporteur.

The issue of fire in the region was made abundantly clear in 1992, when a large wildfire burned in the Chornobyl Exclusion Zone (CEZ) in Ukraine. As mentioned earlier, the relatively nearby Russian fires in 2010 also sparked great public concern in Kyiv that the smoke blanketing the city may contain radionuclides from the CEZ. Thankfully there have been few major fires in the area, but the passage of time and the additional complications associated with fire management across national borders ensures that this threat will continue to grow.

Table 5. The area and category of lands in UNECE countries contaminated by Unexploded Ordnance (UXO), Land Mines and Radiation

Country	Area	Notes / Nature of contamination
Albania	Unreported	WWII UXO, Land mines near Kosovo border | Common injuries to civil. and f-fighter | Currently mapping extent
Belarus	1.5 million ha	Radioactive contamination to forests and farmland
Croatia	66 600 ha	UXO and Land mines from civil war | Warning signs present
Germany	650 000 ha	UXO on former military training areas and combate theatres of WWI and WWII
Greece	Unreported	Remnants from WWII and Civil war | Firefighting forbidden
Lithuania	100 ha	Unexploded Ordnance
FYR Macedonia	Unreported	Near Greek border (Bitola) - UXO stemming from WWI | Explosions observed during fires
Russian Federation	1 million ha	Radioactive contamination to forests and farmland
Serbia	'large areas'	Land mines, UXO & suspected Uranium 'dirty' bombs | Firefighting forbidden.
Ukraine	2.2 million ha	Radioactive contamination to forests and farmland

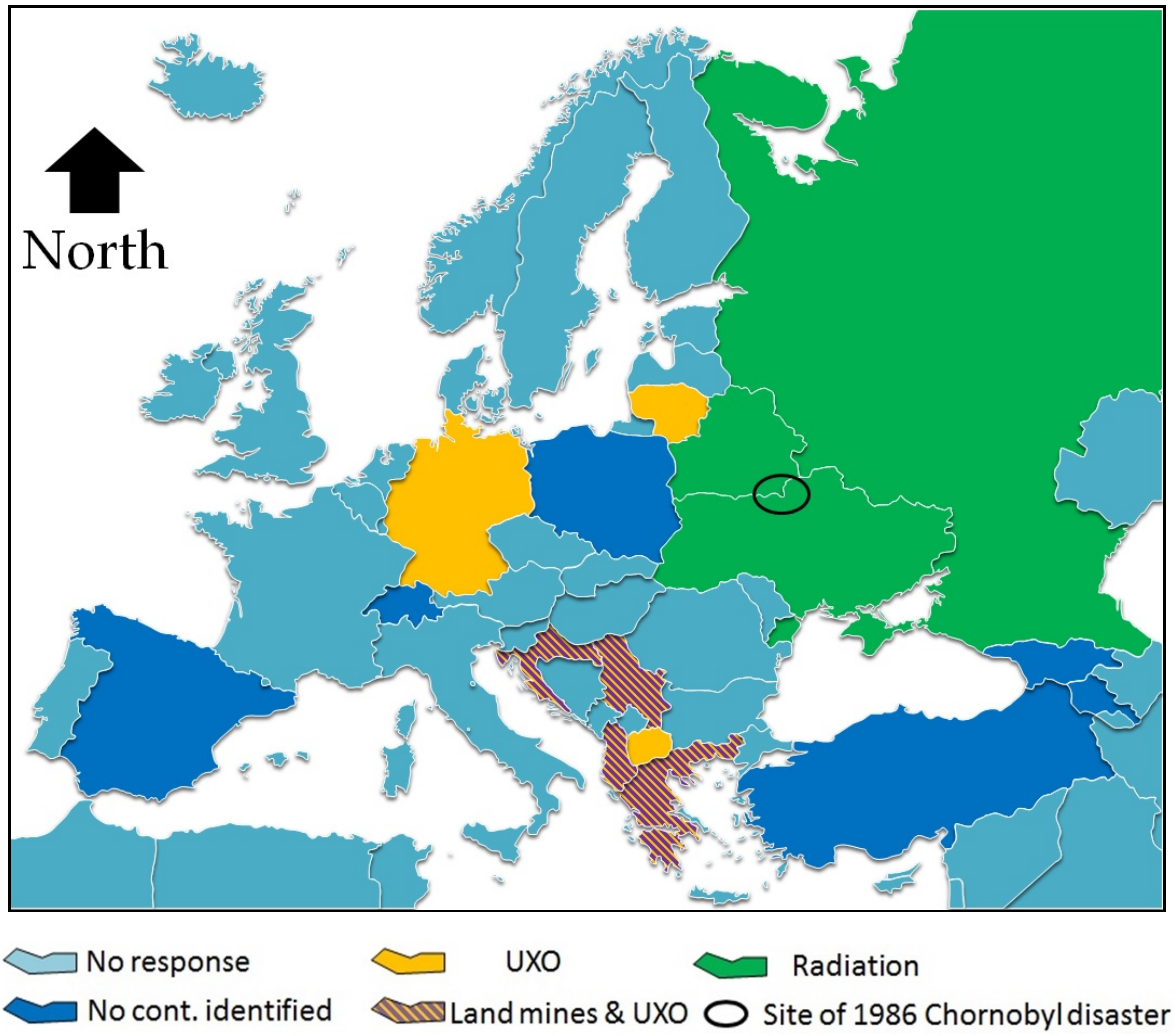

Figure 1. A geographical view of the important contamination issues identified in Europe. Those countries that identified particular contamination issues with relevance to wildland fire are highlighted, giving a basic insight into the sub-regional issues

Section XI – Transboundary / cross-border fires

All responses to the questionnaire report that border areas hold some potential for fire to cross an international boundary. In some cases, such as the Spanish-French border of the Pyrenees, it is less common due to topography and climatic variables. On the other hand, the German and Ukrainian correspondents note that during the wildfire episode in the Russian Federation in August 2010 a long-distance smoke impact on these countries was observable.

Section XII – Bilateral or regional agreements – information, SOPs, resource-sharing

In order to deal with the border-crossing fires mentioned in Section XI of this questionnaire, all respondents report that arrangements exist between local fire response agencies either side of national borders that allows cooperation and the operational crossing of borders in fire events.

Beyond this, *ad hoc* lending and borrowing agreements have occurred between various countries in response to specific, one-off emergency situations. Examples of this were specifically mentioned between Albania and Italy, Turkey and Libya, and Ukraine and Greece, among others.

Sub-regional agreements

Additionally, longer-term, sub-regional agreements that assure assistance for future emergencies exist in some cases – particularly where the group of countries share a common history. For example, the Commonwealth of Independent States (CIS), which is composed of ex-soviet countries, has an established a regional agreement, and there appears to be higher-than-usual cooperation between the former-Yugoslavian Balkan states, despite the conflict that marred the period immediately after separation.

These agreements often take the form of Memoranda of Understanding (MoUs) or governmental agreements that specify the cases in which assistance will be provided as well as the operational, legal, financial and border-crossing arrangements that make it possible, including Standard Operating Procedures (SOPs) and harmonization of training.

European Union Civil Protection Mechanism (EUCPM)

An important development in the UNECE region in recent years has been the move by the European Union to provide an international force, by multilateral agreement, which can be deployed to all manner of emergencies, including wildfire events. The wildland fire components of the Civil Protection Mechanism (CPM) are still in their infancy, but a number of responding countries refer to it as central to their international cooperative efforts.

The recent and prospective EU-member states of Albania, Croatia, Serbia, Lithuania and FYR Macedonia as well as their regional neighbour Greece all expressed a keen interest in benefiting from, and contributing to this continent-strong mechanism. The reasons for this regional enthusiasm cannot be unequivocally identified, but the combination of a sense of duty to such an important regional body as well as identification of the economic benefits to be realised through cooperation may be behind this regional move.

Cooperation with distant allies

Beyond working at the regional level, there are a number of countries in the UNECE region actively pursuing agreements and arrangements with partners further afield. Working with distant countries seems to be encouraged in situations of two types. First, where the partner organization abroad may have particular experience that may be advantageous - for example Spain, Greece and the Russian Federation are working with the United States of America on sharing training and incident command knowledge and procedures. On the other hand, the resource-sharing arrangement that Canada has established with New Zealand takes advantage of the fact that the partner country is unlikely to experience wildfire emergencies simultaneous to Canada, so resources are more likely to be reliably available.

The case of Germany is unique in this theme. The country rarely experiences severe wildland fire events, and as such has not entered into many regional and international cooperative agreements at the official level. On the other hand, the presence of the Global Fire Monitoring Center (GFMC) on German soil has made the country central to a great number of agreements, negotiations and developments of international cooperation within and beyond the borders of the UNECE, including facilitating exchange of experts in times of crisis. At the government level Germany has been highly supportive of these activities and appears to be willing to enter into agreements when the circumstances indicate that it would be of benefit.

The Incident Command System

The implementation of the Incident Command System (ISC) is considered by a number of countries and organisations within and outside the UNECE region to be an essential step toward facilitating effective cooperation at the international level. While the structure and operation of the ICS is still undergoing constant improvement, it is definitely the most widely-used incident management system at the global scale and has been key, even fundamental, to some of the most effective examples of international cooperation such as those in existence between Canada, US America, Mexico, Australia and New Zealand.

Recognition of this is clear in Canada, where ICS is used at all levels and between all agencies for the express goal of eliminating conflicts and inefficiencies between responding agencies during wildfire events. Beyond that, the respondents from Spain and FYR Macedonia explain that locally-suitable versions of ICS are currently under development with the primary goal of improving cooperation at international events and with the potential for ICS to be applied domestically at some future time.

Section XIII – Specialised training and personnel

The nature of wildland fire demands that those involved in prevention and suppression activities are furnished with special skills and equipment additional to those that they require for other aspects of their job. This is particularly important in cases where wildland fire is not their professional focus, or is just a minor part of the job they are required to fulfill. In many parts of the UNECE region, the low frequency with which wildland fire exposes its talons dictates that maintaining a specialized force is not practical, and as such, urban firefighters, search and rescue professionals and the military are often those called upon to fight fire in the environment.

Domestic Wildland Fire Training

The existence of highly specialized, dedicated wildland fire forces among the responding countries is most commonly reported where their specialized skills are called upon frequently. Regardless of the particular agency responding to wildland fire, the personnel undertaking operations in Spain, Canada and Turkey are trained to deal primarily with vegetation fires, and the Aerial Forest Protection Services of Belarus (Bellesavia) and the Russian Federation (*Avialesookhrana*) take substantial pride in providing specialized firefighters. An exceptional example among those with a specialized force can be found in Lithuania, which does not appear to have a particularly pronounced wildland fire problem.

On the other hand, most responding countries report that the personnel that respond to wildland fire are not trained primarily for this purpose but do receive some training to adequately equip them when fire situations arise. These responders may be employed by a general Emergency Service, a Fire and Rescue Service, the Forest Service or the Military. This group of countries is made up of Armenia, Croatia, Georgia, Kazakhstan, FYR Macedonia and Serbia.

Beyond this, a number of respondents report that their primary human resources tasked with fighting forest and vegetation fires are basically untrained in techniques of extinguishing or suppressing fires in open space. For the most part, the firefighters and emergency responders in Albania, Switzerland, Ukraine and Germany are required to depend upon their adaptability and quick thinking to protect themselves and their communities in the case of forest and other vegetation fires.

Women on the firefront

While 'tradition' dictates that wildland fire management is a man's world, there appears to be a trend toward recognition that creating a more even gender balance in all workplaces is desirable for the benefit of the organization and its goals. Nonetheless, women are still explicitly excluded from serving in professional or volunteer fire brigades in Albania, Armenia, Belarus and Lithuania.

On the other hand, women reportedly make up a sizable proportion of some fire management organizations. Notable examples include Georgia, at 30% and Croatia, at 15%.

In countries where women are not forbidden from serving, it is noted that their participation is more commonly found in logistics and support roles rather than actively fighting fires. Usual positions apparently include fire detection, catering and provisioning roles. It is unclear from the responses whether women are well represented in incident management roles or in higher positions within fire management organisations.

Sharing of Training and Expertise

The evidence provided regarding the international sharing and harmonizing of training largely mirrors the patterns described in Section XII of this analysis. Again, a number of Commonwealth of Independent States' (CIS) countries cooperate on harmonizing their training and techniques, as do the countries in the Balkan region, among which FYR Macedonia and Turkey appear to display the most enthusiasm.

Notable examples of cooperation over greater distance exist as well, with Albania describing cooperation with Italy and Turkey, Croatia working with Italy and France, and Spain actively working with the United States to share training resources and harmonies skills and equipment with countries they would like to work with.

In response to their desire to lend and receive expertise in case of fire situations with the goal of cooperatively enhancing regional fire preparedness, almost all countries were described as having a high degree of support for facilitating exchange programs involving national experts. Chief among these are countries that recognize an internal vulnerability due to a perceived lack of domestic capability. The respondents from FYR Macedonia, Lithuania and Kazakhstan all mention that such a mechanism would be advantageous in bolstering the internal wildfire capacity.

Reserved responses on this topic were received from the Spanish and Canadian reporters, which both stated that such decisions must be made at the Provincial / Comunidad level, and as such, the national reporter was not in a position to comment.

Section XIV – Volunteer firefighters

The use of volunteer firefighters is a popular method of both engaging local populations in wildland fire management and cost-effectively increasing the overall wildland fire response capability by training and equipping a dispersed and part-time force of local people to assist in fire emergencies. The approach taken to achieve this varies greatly across the UNECE region and beyond, but some aspects which are generally considered desirable include; sufficient and compatible training to be able to effectively assist the professional fire responders; sufficient and compatible equipment and communications' to further the same goal and; reasonable financial and legal assistance and insurance to ensure that when volunteering results in time off work, an injury or, at worst, a fatality, the volunteer, their family and their employer are minimally adversely impacted.

Such a complete organisational structure is described in a number of the responses to the questionnaire, namely Croatia, Kazakhstan, FYR Macedonia, Serbia, Switzerland and Germany.

Where volunteer fire brigades exist, but not all these factors are catered for, the reasons for the deficit are assigned to a variety of sources, including simple lack of funding, inadequate representation at higher levels of government or even a desire to remain autonomous and self-reliant.

The responses to the questionnaire received from Armenia, Belarus, Turkey and Georgia indicate that volunteers play no organized role in wildland fire management or response.

Section XV – Participation of civil society

The goal of most agencies tasked with managing wildland fire is to protect public assets as well and the lives, livelihoods and assets of the communities living the areas that may be impacted by fire. Engagement with these populations can take a number of forms, including the volunteer fire brigades mentioned in Section XIV of this analysis.

Apart from this, a number of approaches were described in the responses received. The most common form of engagement with civil society is to raise public awareness of the possibility of wildfire during the fire season followed by advice to evacuate or take cover in the event of a wildfire. This approach is the limit of that used by Armenia, Belarus, Croatia, Lithuania, Georgia, Germany, the Russian Federation, Serbia and Turkey. In these cases emphasis is placed on preventing accidental ignitions from, for example, campfires and cigarette butts, and extends to closures of forest recreation areas in particularly high fire danger conditions. The medium of public information is usually television and radio broadcasting and roadside signage.

As a step up from this approach, Poland, Switzerland, Kazakhstan, Spain and Ukraine publish advice on websites in an attempt to reach a wider audience. In the case of Ukraine, inspection of farm machinery for adherence to fire prevention laws prescribing machine condition and the presence of a fire extinguisher has been identified as a particular path to reduce the incidence of accidental fires.

Going further, year-round initiatives exist in both FYR Macedonia and Canada that raise awareness about the steps that individuals and organisations can take to reduce the national wildfire threat. In FYR Macedonia this takes the form of the traditional approaches, with greater emphasis, including 'Month for Protection Against Fires' and National Day of Firefighters. Notably, an inter-sectoral approach is taken which integrates the Agriculture Sector in the fire management dialogue.

In Canada, particular emphasis is put on providing the entire population with information that will assist them to decrease their own exposure to the risk of wildfire. The 'FireSmart' programme encourages rural and urban-fringe residents to undertake actions on their properties such as reducing the vegetation load around buildings and buying and installing basic fire suppression devices and tools. In a compelling contrast, the lack of precisely this kind of civil participation was mentioned as a major shortfall in the Greek approach to fire management at the domestic level.

Section XVI – Use of advanced data and information systems with a focus on fire management

All countries that submitted a response to the questionnaire report that during the declared 'fire season', a system exists comprising of at least daily evaluation and reporting of the fire weather situation based on hydro-meteorological input data. Some of these are home-grown systems such as those used in Belarus, the Russian Federation, Poland, Switzerland and Germany. Other countries, such as Serbia and Croatia, borrow and adapt a foreign or international system to suit their conditions. A common system used is the Fire Weather Index (FWI) scale developed in Canada.

On top of these hydro-meteorological fire weather indices, a number of countries make mid-term forecasts of fire danger through use of some kind of internationally available dataset, such as the Moderate Resolution Imaging Spectroradiometer (MODIS), the European Forest Fire Information Service (EFFIS), the EU Meteorology Satellite (EUMETSAT) and the Canadian Global Early Warning System (EWS). Countries using these resources include Ukraine, Spain, FYR Macedonia, Greece and Canada.

Leading on from making mid-term fire danger assessments, this kind of information is also being used to develop forecasts for the future nature of wildland fire under conditions of changing climate. The cohort of countries that describe this kind of foresight include Spain, Switzerland, Serbia, FYR Macedonia, Ukraine, Greece, Croatia and Canada.

Section XVII – Fire research with application in management

The nature of research into wildland fire and its management can be broadly divided in two different ways. The first of these is by considering in which institutions the research is taking place. In the cases of Belarus, Poland, Kazakhstan and Spain, research into wildland fire is based in the forest industry. It cannot be clearly established from the responses given, but in these cases there may be a tendency to reinforce the misleading mantra that vegetation fire is predominantly a 'forest' issue to be dealt with. On the other hand, research in Canada, Ukraine, the Russian Federation, Croatia, Greece, FYR Macedonia, Serbia and Switzerland is integrally linked to university departments specialising in Forestry, Fire science, Natural disasters and Atmospheric science. The reporters from Albania, Armenia, Georgia and Lithuania claim that no direct research is being undertaken into wildland fire or its management.

Another way of considering the nature of wildland fire research is to look at the main topics that are being looked at. In cases where the science of fire in the environment is at a relatively early stage, research is dominated by looking at fundamental fire behaviour and fire ecology topics, as researchers and managers alike strive to understand the nature of fire in the landscapes of interest. This approach is mentioned in reference to Croatia, FYR Macedonia and Switzerland.

In contrast, in situations where this fundamental research was undertaken in previous decades, current research tends to be forging paths into more contemporary topics. For example, in Canada and Spain there is substantial focus on social change and the Wildland Urban Interface (WUI). In Serbia, the nature of human behaviour in emergency events is becoming a special topic. In Turkey, the socio-economic impacts of fire are being examined and in Ukraine, Black Carbon emissions, the nature of agricultural fires and the specific threat of fires in radioactively contaminated terrain are current topics.

ANNEX:

Original Questionnaire circulated in preparation of the UNECE/FAO Forum

UNITED NATIONS
ECONOMIC COMMISSION FOR EUROPE

FOOD AND AGRICULTURE ORGANIZATION
OF THE UNITED NATIONS

FORESTRY AND TIMBER SECTION

UNECE / FAO Regional Forum on Cross-boundary Fire Management

Organized by

The UNECE Trade and Timber Division and the Global Fire Monitoring Center (GFMC), Germany, supported by the German Federal Ministry for Agriculture, Food and Consumer Protection, and the Secretariat of the United Nations International Strategy for Disaster Reduction (UNISDR), the Council of Europe through its Euro-Mediterranean Major Hazards Agreement (EUR-OPA), and the Organization for Security and Cooperation in Europe (OSCE)

Venue and date: Palais des Nations, United Nations, Geneva, 28-29 November 2013

Preparatory Enquiry / Questionnaire
Final Version: 08 September 2013

Note 1: This Questionnaire has been compiled by GFMC with support of some members of the UNECE/FAO Team of Specialists on Forest Fires. The aim of the questionnaire is to provide background information / data for the discussions at the Forum. The Questionnaire will be filled by the national focal points (Team Members and other voluntary contributors from UNECE Member States) who will coordinate / collect information in their respective home countries (Team Member list: see Annex).

Note 2: The Questionnaire is also provided in Russian language (starting on page 18 of this document).

Requested deadline for returning the Questionnaire:

15 October 2013

UNECE member states, which are not represented in the Team are kindly asked to establish contact with the Forum Project Officer, Mr. Peter W. Sheldon and to nominate an expert to work on this questionnaire and communicate, if needed, with Mr. Sheldon (peter_william@hotmail.com).

Purpose of the Questionnaire: Compilation of a database of specific wildland fire problems in UNECE Member States and status / prospects of international cooperation in fire management that will be addressed by the Forum.

Name of Country:

(I) Fire-prone lands, wildfire occurrence and wildfire damages

Brief overview of magnitude of wildfire problems and major damages (averages or extraordinary events) in the country. Please feel free to adapt / modify the type or classification of forest and other vegetation types affected by fire in accordance with national classification (left column).

Type of vegetated land subjected to	**Total area** (ha)	Average area burned annually (preferably during the last decade, e.g. 2002-2011; indicate time period)	**Damages** Highlight extraordinary events or totals, e.g. houses, infrastructures affected; fatalities and injuries
Forests			
Protected areas (non forests)			
Other vegetation (e.g., wetlands)			
Agricultural lands			
Military or national border areas			
Other categories of vegetated lands (according to national classification)			

(II) Addressing the complexity of wildland fire issues: National coordinated or coherent fire management policies or strategies

Some national statistical wildfire databases and country reports provide information and data on occurrence and damages of fires affecting forests only. However, the wildfires affect all vegetation types, and wildfire origins are especially linked with cultural landscapes. Conversely, the consequences of wildfires include damages on the local and global environment, and on human health and security:

- Many forest fires originate in agricultural and pasture lands
- Impacts of fire smoke pollution on human health and security sometimes exceed direct fire damages
- Other secondary damages such as landslides, mudslides, increasing runoff, erosion and flooding may also exceed direct fire damages
- Wildfires may cross jurisdictional boundaries and thus involving inter-agency coordination and response
- Fire impacts may affect international commitments, treaties and conventions related to long-range transport of air pollutants, transboundary deposition of black carbon, impacts of solid and gas emissions on the composition and functioning of the global atmosphere, terrestrial carbon stocks, biodiversity, etc.

In some countries the use of fire in land management or the prevention and control of wildfires is addressed by specific, sectoral legislation. Other countries have developed policies that address fire management from a cross-sectoral point of view.

Please fill the table below with information about sectoral legislation and – if in place – about a coherent, cohesive or cross-sectoral national approach to wildland fire (e.g. in the form of a national fire management policy, inter-agency and regional and federal administrative arrangements). Please fill the “narrative” boxes with short explanations.

Policies, laws and regulations	**Are policies, legislation or regulations in place?** (yes / no)	**Short Narratives**
National Fire Management Policy		*Provide date and source of policy document, regulation, etc.:*
Inter-agency mechanisms, e.g. - Standing inter-agency fire management board (or advisory group) - Interagency wildfire emergency response - Inter-agency procedures for preparedness and prevention		*Provide list / sources of regulations:*
Regulations for fire use in: - Forestry - Agriculture - Conservation areas - Other lands		*Provide list / sources of regulations:* Note: See also Question IV
Legal provisions for fire bans (i.e. the use of fire in land management is not permitted at all)		*Provide list / sources of regulations:*
Use of fire for reducing easily burnable vegetative matter and thus reducing wildfire hazard		*Provide list / sources of regulations:*
Use of fire for disposing of vegetation residues (agricultural residues, pasture cleaning, forest slash, garden residues)		
Restrictions for the use of fire with regards to air quality standards and human health (PM10, soot / black carbon)		*Provide list / sources of regulations:* Note: see also Question VI
Use of fire with regards to air quality standards affecting human security (visibility, traffic)		*Provide list / sources of regulations:*
Use of fire for trash / waste disposal		*Provide list / sources of regulations:*
Use of fire to reduce gas and particle emissions affecting the global atmosphere		*Provide list / sources of regulations:*
Use of fire to enhance biodiversity **or** prohibition of fire to reduce damage of biodiversity		*Provide list / sources of regulations:*
Penalties for starting a wildfire or illegally applying fire in land use		*Provide list / sources of regulations:*

Protocols, agreements for cross-boundary fire management with neighbor countries (national and / or provincial agreements)		Note: see also Question XII
Other		

(III) Institutional responsibilities in fire management

List the different agencies, administrative bodies, land owners or civil society groups responsible for fire management.

Type of vegetated land	**Agency, administration or land owner responsible for wildfire prevention**	**Agency, administration, land owner or volunteer groups responsible for wildfire suppression**	**Comments** (e.g., current plans for institutional reforms or changing responsibilities)
Forests			
Agricultural lands			
Protected areas			
Other vegetation (barren lands; abandoned lands / fallow)			
Interface between natural vegetation or agricultural lands with rural settlements, villages, farmsteads and other individual houses & infrastructures in the rural space			
Military or national border terrain			
Other			

(IV) Use of prescribed fire

In some natural vegetation types (forest, other lands) lightning fires and also human-ignited fires play an essential role in shaping species composition and functioning of ecosystems. In some cultural landscapes, which include agricultural lands, pasture lands and also intensively managed forest ecosystems, fire has been used traditionally to facilitate land management, or increase productivity or biodiversity. Please list current practices, legal provisions, and possible future fire management options involving prescribed natural and management fires.

Lands-use type or specific management objectives	**Is fire use commonly practiced?** (yes / no)	**Is the use of fire permitted by law or banned ?**	**Management objectives and practices (Narratives)** (please mention also possible benefits of fire application, even if currently not yet sanctioned or explicitly forbidden)
Natural forest (non-managed)			
Intensively managed forest			
Forest plantations			
Agricultural lands			
Pastures			
Abandoned agricultural and pasture lands			Note: see also Question V
Nature conservation areas (protected lands, including UNESCO Natural and / or Cultural Heritage Sites)			
Landscape management			
Waste disposal			
Other vegetation types or land use			

(V) Fire management in abandoned agricultural and pasture lands

As a consequence of rural exodus (urbanization of rural populations) all over the Eurasian region formerly cultivated lands are increasingly abandoned. This leads to vegetation succession, increased availability of burnable vegetation, de-fragmentation of cultural landscapes, and thus to an overall increasing wildfire hazard - particularly of large fires in rural landscapes. Depopulation and aging of remaining rural populations result in a diminished rural work force available to defend rural assets against wildfires. Please highlight briefly the situation in your country.

Rural exodus and land abandonment	**Is this a relevant problem affecting wildfire?** (yes / no)	**Short Narratives**
Rural depopulation		*Indicate demographic and migration trends; "dying" of farmsteads or villages*
Development of fallow and succession with higher fire hazard (as compared to formerly cultivated lands)		*Indicate if abandoned fields are subjected to succession with temporary increase of wildfire hazard*

Monitoring of land-use change (by space or terrestrial methods)		**Provide monitoring / statistical data (e.g., examples)**
Policies or regulations about the use, rehabilitation or ecological rehabilitation of abandoned agricultural and pasture lands		**Main rules or adopted measures**
Specific action concerning restoration / ecological rehabilitation of abandoned terrain, aiming at restoring ecosystem services (both cultural or natural ecosystems) and / or reducing wildfire threats (e.g. formerly drained and exploited wetlands / peat lands)		**Narrative**
Responsibility for fire management on abandoned lands		**Agency / institution is responsible for fire protection**
Increasing average age of rural populations resulting in declining availability of young work force		**Provide monitoring / statistical data (or examples)**
Reduced availability of rural farmers or volunteers who are capable to prevent wildfires and / or assist in fire suppression		**Narrative**
Indication of problems identified by studies and publications or specific measures taken concerning fire problems and fire management solutions on abandoned terrain		*Provide (attached) reference(s)*
Describe the specific threat to rural populations and infrastructure from wildfires burning on abandoned lands (e.g., typical wooden structures threatened by wildfires / build up of vegetative fuel in populated areas)		**Narrative**
Other relevant habitat maintenance or restoration measures (e.g. maintaining open land habitats by grazing or prescribed fire)		**Narrative**
Other relevant issues		**Please add**

(VI) Vegetation fire emissions: Impacts on human health and security

Emissions from wildfires in forests, peat lands and vegetation types, and emissions from agricultural burnings affect human health and security. Please provide experiences, examples and legal provisions.

Vegetation fire smoke emissions: Human health and security considerations	**Is this relevant in your country** (yes / no)	**Short Narratives**
Do you have laws or regulations that regulate fire use with regards to protection of human health and security?		*Provide list / sources of regulations:*
Narrative or statistics of episodes of major air pollution linked to wildland fires		**Narrative or statistics**
Hospital admissions and premature deaths during heat and fire episodes (in rural lands and metropolitan areas)		**Narrative or statistics**
Traffic accidents due to obstruction of visibility (road, railroad, maritime, air)		**Narrative or extreme events**
Measures to alert populations of fire-smoke or radioactivity pollution (warning or evacuation messages, other precautionary measures to protect the public from dangerous exposure to wildland fire smoke)		**Procedures**
Do you have specific guidelines for agencies to be prepared to cope with major smoke pollution episodes (public advisories, provision of adequate protective devices, shelters)		*Provide list / sources of guidelines or regulations:*
Other relevant issues		**Please add**

(VII) Vegetation fire emissions: Impacts on the environment

Emissions from wildfires in forests, peat lands and other vegetation types, and emissions from agricultural burnings affect the local, regional and global environment, e.g., atmosphere, climate, or surface reflectance). Please provide experiences and examples from your country.

Vegetation fire smoke emissions: Environmental considerations	**Is this relevant in your country** (yes / no)	**Short Narratives**
Do you have laws or regulations of fire use with regards to - protection of the atmosphere (e.g., "greenhouse gas reduction") - terrestrial deposition (e.g., black carbon deposition) - burning of waste deposits / landfills (Note: see also Question X)		**Narrative**

(VIII) Impacts of forest fires and other vegetation fires on the economy

In some countries fires burning in forests and other vegetation lead to considerable economic losses. Please provide important losses and damages experienced in your country (e.g., by specific extreme years, or long-term statistical data, if available)

Economic losses	**Is this relevant in your country** (yes / no)	**Short Narratives** (examples or statistical data if available)
Direct damages in land-use systems, e.g.: - loss of agricultural crops / plantations - loss of livestock - other		**Narrative / examples / statistics**
Indirect / secondary damages, e.g.: - land & mud slides - floods - water quality - tainting of products by smoke (e.g., viticulture) - other		**Narrative / examples / statistics**
Infrastructure and structures dispersed in the rural landscape, e.g.: - houses - outbuildings (barns, sheds) - fences and other - telegraph / telephone poles - electricity supply - railroad sleepers - other		**Narrative / examples / statistics**
Infrastructure and structures at the interface between forests / other vegetation and suburban / residential areas, e.g.: - houses - industrial and other businesses - other		**Narrative / examples / statistics**
Other relevant issues		**Please add**

(IX) Human fatalities and injuries

Since 2008 the GFMC has been collecting and publishing the Annual Wildland Fire Fatalities Report (since 2011 also including other economic losses). These reports are rather incomplete due to a lack of national reports and inconsistent reports in the media. Please provide brief information on major losses or (if available) statistical data.

Human fatalities and injuries	**Is this relevant in your country** (yes / no)	**Short Narratives** (examples or statistical data if available)
People killed or injured by wildfires, e.g. according to groups: - professional and voluntary firefighters - other civil protection or armed forces personnel - civilians		**Narrative / examples / statistics**

(X) Specific fire problems in forests and other wildlands contaminated by radioactivity, chemical and other industrial deposits, unexploded ordnance, land mines and uncontrolled waste deposits

Within the UNECE region some areas which have been contaminated by industrial deposits or accidents (including radioactive contamination), armed conflicts (leaving behind unexploded ordnance or land mines) and uncontrolled waste dumps are subject of wildfire risk. Wildfires burning in contaminated terrain may involve additional risks to humans and especially to firefighters. Please list briefly the existence of such problem in your country.

Type of vegetation / land contamination	**Total area (ha)**	**Specific Hazards affecting human and environmental safety / security** (including secondary effects)	**Narrative of extreme events and measures of prevention and combat of dangerous fires**
Radioactivity			
Chemical and other industrial deposits			
Unexploded ordnance			
Land mines			
Other (e.g. uncontrolled landfills / garbage deposits) (see also Question VII)			

(XI) Transboundary / cross-border fires

Fires burning near borders or crossing borders, or vegetation fire smoke transported across national borders may require international rules or regional or bilateral agreements to be invoked (see also next question XII). Please list your neighbor country (or countries) with common borders and any previous experience or potential risk of border-crossing fires or fire smoke transport.

Cross-border Issues	Narratives
Border-crossing wildfires (from / to which country?)	
Border-crossing smoke transport	
Fires affecting border infrastructures	

(XII) Bilateral or regional agreements for cooperation in fire management, including sharing of human and technical resources during fire emergencies

Provide information on bilateral or multilateral protocols that regulate international cooperation in fire management with other countries.

Type of cross-border or international cooperation	Narratives
List any protocol or legal agreement at bilateral level regulating transboundary cooperation in fire management	
Does the country have Standing Operation Procedures (SOPs) or protocols that regulate details of reciprocal assistance (i.e. for receiving and providing assistance) in fire emergencies (or other emergencies that could be applicable to fire emergencies), e.g. agreements on responsibilities, liabilities, insurance, cost-sharing, communication or incident management?	Yes / No Narrative
Is the country applying the Incident Command System (ICS) at national level	Yes / No Narrative
Does the country have exchange of fire management personnel with other countries (regular or occasional mutual information, training or exercises)	

Provide a list of cases of assistance your country has provided to other countries to during wildfire emergencies in the last 10 years (date, host nation, forces deployed, sources of reports, evaluations, etc.). Note: If applicable, this list should include emergency support rendered through the EU Civil Protection Mechanism.	
Provide a list of cases of assistance your country has received from other countries during wildfire emergencies in your country in the last 10 years (date, nation providing assistance, forces hosted, sources of reports, evaluations, etc.). Note: If applicable, this list should include emergency support rendered through the EU Civil Protection Mechanism.	

(XIII) Training of fire management personnel

In many of the UNECE member states the responsibility for fighting wildfires is solely that of the Fire and Rescue Services. In emergency situations civil protection personnel and / or military may become involved. A few member states have specialized forest firefighting units. Special vegetation fire training for fire management personnel and particularly firefighters is required to ensure professional, safe and efficient firefighting operations.

Fire Management Training	Narratives
Does the country have specialized wildland fire fighters who are capacitated by specific training and qualification standards?	Yes / No Narrative
If firefighting responsibility is with Fire and Rescue Services or Emergency Management Services: Are these capacitated for wildfire fighting by specific training and qualification requirements?	Yes / No Narrative
What kind of training in fire management is provided in your country?	
Do you share fire management training with neighbouring or other countries?	Yes / No Narrative
Do you use fire management training materials identical with methodologies of neighbouring or other countries, in order to facilitate exchange?	Yes / No Narrative
Would your country be willing to host fire management specialists to accompany (“shadow”) your own fire management specialists during average or large fire situations, so that they would get experience in handling average and large fire incidents?	Yes / No Narrative
Vice-versa - would your country be interested to send fire management specialists to accompany (“shadow”) fire management specialists in other countries during average or large fire situations, so that they would get experience in handling average and large fire incidents?	Yes / No Narrative
Gender aspects: Are women actively participating in the recruitment and / or later in professional fire and rescue services? If yes, provide share (%).	Yes / No Narrative

(XIV) Volunteer firefighters

Please describe the arrangements concerning volunteer fire fighting forces and their responsibilities, focusing on the points below.

Volunteer Fire Fighters	**Narratives**
Do you have volunteer fire fighters? If yes, how many?	Yes / No Narrative
Are volunteer fire brigades fully integrated in operations fighting forest and other vegetation fires?	Yes / No Narrative
Are training / qualification standards compatible with those of professional fire fighters?	Yes / No Narrative
Are volunteer fire fighters protected by the same legal and insurance mechanisms as professional fire fighters?	Yes / No Narrative
Do volunteer fire fighters or their employers receive remuneration for loss of income during firefighting operations?	Yes / No Narrative
Source of funding supporting volunteer fire brigades	Narrative
Type of equipment used by volunteer fire fighting brigades	Narrative
Gender aspects: Are women actively participating in the recruitment and / or later in active volunteer fire services? If yes, provide share (%).	Yes / No Narrative

(XV) Participation of civil society, particularly local communities, in prevention, preparedness and self-defense against wildfires

In the cultural landscapes of temperate Eurasia the vast majority of wildfires are caused by humans, predominantly as consequence of agricultural and other plant residual burning; other human causes of wildfires stem from general negligence and thus are avoidable. Therefore the occurrence of wildfires can be reduced and impacts mitigated through active participation of rural communities with the overall goal to prevent wildfires by reducing inappropriate and unsafe land-use fires, and to defend rural assets (agricultural fields, gardens, orchards, and forests, as well as homes, outbuildings and infrastructures) against wildfires. Apart from the role of volunteer rural fire and rescue units, rural civil society plays an important role in wildfire prevention and defense of wildfires at the early stage until rural fire units would arrive on scene.

Participation of civil society and particularly local rural community members in fire management	**Narratives**
Is there some kind of program aimed at informing the general public about how they can prevent wildfires such as advice on farm operations or leisure activities?	Yes / No Narrative
How is the general public informed of developments during a wildfire emergency, such as evacuation advice?	Yes / No Narrative
Do you have a system for informing the general public about how they can avoid wildfires damaging their property?	Yes / No Narrative
Do you have a special outreach and capacity building programme for the defense of villages, farmsteads and other rural assets against wildfires?	Yes / No Narrative
Do you have a special outreach and capacity building programme for the defense of values at risk between wildlands and urban / suburban fringes (“wildland-urban interface)?	Yes / No Narrative
Other relevant issues not mentioned in this questionnaire	Narrative

(XVI) Use of advanced national, regional and global data and information systems with focus on application in fire management

An increasing variety of commercial and freely available (open-access) systems / services provide satellite-derived Earth Observation and ground-based Earth Observation data (e.g., hydrometeorological information), as well as modeling tools (short- to medium-term early warning and climate modeling).

Use of advanced national, regional and global data and information systems	**Narratives**
Do you have a national fire danger rating / early warning and monitoring system in place? Please provide details and / or the online source.	Yes / No Narrative
Do you have a national satellite or ground-based fire detection and / or monitoring system in place? Please provide details and / or the online source.	Yes / No Narrative
Are you using regional and global fire early warning, active fire detection & monitoring systems *in lieu* of a lacking national system?	Yes / No Narrative
How is the public informed of fire danger ratings and what background information are they provided with?	Narrative
Did your country develop or consider climate-change models for planning future need for action, e.g. for national fire management policy or strategic planning?	Yes / No Narrative
Other relevant issues not mentioned in this questionnaire	Narrative

(XVII) Fire research with focus on application in fire management

Informed fire management decisions rely on state-of-the-art technology and science (dedicated wildland fire science and related sciences, e.g. climatology / climate change science). Within the UNECE region the capabilities and emphasis of dedicated national wildland fire research varies and may not cover the entire spectrum of research. This is calling for exchange of scientific-technical information and ensuring relevance and quality for fire management decision support.

Status and future needs in fire research with focus on application in fire management	**Narratives**
Do you have a dedicated wildland fire research unit in your country (at universities, academies or other state or private organizations)? Please consider different levels from nation to local.	Yes / No Narrative
Are fire management concepts based on the state-of-the-art science?	Yes / No Narrative
List any research needs arising from expected changes in the future wildland fire theater.	Narrative
Other relevant issues not mentioned in this questionnaire	Narrative

ОБЪЕДИНЕННЫЕ НАЦИИ
ЕВРОПЕЙСКАЯ ЭКОНОМИЧЕСКАЯ КОМИССИЯ

FOOD AND AGRICULTURE ORGANIZATION
OF THE UNITED NATIONS

FORESTRY AND TIMBER SECTION

Европейская экономическая комиссия ООН ЕЭК / ФАО Региональный форум по управлению трансграничными лесными пожарами

Организованный

Группой специалистов по лесным пожарам Европейской экономической комиссии ЕЭК ФАО и отделением по торговле древесиной ЕЭК ФАО через их координатора – Центра глобального мониторинга пожаров, Германия, при поддержке Федерального Министерства сельского хозяйства, защиты продуктов питания и потребителей Германии, и Секретариатом Организации Объединенных Наций по Международной стратегии уменьшения опасности стихийных бедствий (UNISDR), Советом Европы на основании Европейско–Средиземноморского соглашения об опасностях стихийных бедствий (EUR-OPA) и Организацией по безопасности и сотрудничеству в Европе (ОБСЕ).

Место проведения и дата: Palaisdes Nations, Организация Объединенных Наций
Женева, 28-29 ноября 2013

Предварительный Запрос / Анкетный опрос
Окончательная версия: 08 сентября 2013

Примечание: Этот анкетный опрос разработан Центром глобального мониторинга пожаров при поддержке некоторых членов Группы специалистов по лесным пожарам ЕЭК ООН / ФАО. Цель анкетного опроса состоит в том, чтобы обеспечить справочной информацией и данными для обсуждений на форуме. Анкетный опрос будет заполнен национальными представителями (членами международной группы специалистов по лесным пожарам и другими добровольными представителями из государств-членов ЕЭК ООН), кто координирует и составляет информацию в своих странах (Список членов группы специалистов: см. Приложение).

Требуемый срок для представления анкетного опроса:

15 Октября 2013

Государствам-членам ЕЭК ООН, которые не представлены в группе специалистов по лесным пожарам, просьба назначить эксперта и установить контакт с представителем организаторов Форума г-ном Питером В. Шелдоном для заполнения анкетного опроса, при необходимости просим консультаироваться с г-ном Шелдоном (peter_william@hotmail.com).

Цель анкетного опроса: Создание базы данных о проблемах с природными пожарами в государствах - членах ЕЭК ООН и формирование определенного статуса / для подготовки доклада Форума о перспективах международного сотрудничества в управлении природными пожарами.

Название страны:

(I) Территории, где возникают природные пожары, их ущерб

Краткий обзор проблем с природными пожарами и их ущербе (среднестатистические данные и/или особенные исключительные факты) в стране. Пожалуйста запоняйте в свободном стиле / можете менять тип или классификацию лесов и другие типы растительности, где произошли пожары в соответствии с национальной классификацией (левая колонка).

Категории природных земель	**Площадь всего** (га)	**Средняя площадь пройденная пожарами в год** (желательно за последнее десятилетие 2002-2011, укажите период)	**Ущерб** Укажите особенные события и факты или общий ущерб с указанием количества уничтоженных домов, объектов экономики, количество жертв и травм
Леса			
Охраняемые природные территории (не лесные)			
Другая растительность (к примеру, луга и торфяники)			
Земли сельскохозяйственного назначения			
Земли министерства обороны или государственные приграничные территории			
Другая категория природных территорий (в соответствии с национальной классификацией)			

(II) Общая комплексная информация: Национальная скоординированная или последовательная управленческая политика или стратегия управления пожарами

Некоторые национальные статистические базы данных о пожарах и отчеты предоставляют информацию только по лесным пожарам. Однако природные пожары затрагивают все типы растительности. С другой стороны последствия пожаров оказывают ущерб региональной и глобальной окружающей среде, на здоровье человека и безопасности:

- Много пожаров происходит на сельскохозяйственных и пастбищных угодьях.

- Воздействия дыма от пожаров на здоровье человека и безопасности в целом иногда превышает прямой ущерб от пожара.

- Другие вторичные повреждения, такие как оползни, эрозии и наводнения могут также превысить прямой ущерб от пожара.

- Пожары могут переходить в другие категории земель и таким образом вовлекать межведомственную координацию и реагирование.

- Воздействия огня могут затронуть международные обязательства и соглашения, в т.ч. связанные с переносом атмосферных загрязнений, трансграничным переносом черного углерода, воздействиями твердых частиц и эмиссий газов на функционирование глобальной атмосферы, запасов углерода, биоразнообразия, и т.д.

В некоторых странах использование огня в землепользовании или профилактике пожаров определено ведомственным законодательством. Некоторые страны развивают политику использования огня с многосекторной (межведомственной) точки зрения.

Пожалуйста, заполните таблицу (ниже) информацией о ведомственном законодательстве, и – если существуют – о последовательном, или межведомственном национальном подходе к природным пожарам (например, в форме национальной политики управления пожарами, региональных и федеральных административных мер). Пожалуйста, заполните столбики "информацией" с короткими пояснениями.

Политика, законодательство и нормативное регулирование	**Имеется ли политика, законодательство и нормативное регулирование (да / нет)**	**Краткое описание**
Национальная политика по управлению природными пожарами		*Укажите дату принятия и название стратегического документа, нормативного регулирования, и т.д.:*
Межведомственные механизмы, например. - Постоянная межведомственная комиссия по управлению пожарами (или консультативная группа) - Межведомственное экстренное реагирование по тушению природных пожаров - Межведомственные процедуры подготовки по предотвращению пожаров		*Укажите список / названия документов*
Инструкции для использования огня в: - Лесном хозяйстве - Сельском хозяйстве - Заповедниках - Других землях		*Укажите список / названия документов* *Примечание: см. также вопрос* IV
Юридические требования для запретов использования огня (то есть использование огня в землепользовании не разрешено вообще),		*Укажите список / названия документов*
Использование огня для регулирования легковоспламеняемых горючих материалов, и таким образом снижение опасностей распространения пожаров		*Укажите список / названия документов*

Использование огня для избавления от остатков растительности (сельскохозяйственные растения, очистка пастбищ, порубочные остатки, остатки в садоводстве)		*Укажите список / названия документов*
Ограничения для использования огня относительно стандартов качества воздуха и здоровья человека (PM10, сажа / черный углерод)		*Укажите список / названия документов* *Примечание: см. также вопрос IV*
Использование огня относительно стандартов качества воздуха, затрагивающих человеческую безопасность (видимость, движение транспорта)		*Укажите список / названия документов*
Использование огня для уничтожения мусора и других отходов		*Укажите список / названия документов*
Использование огня в отношении уменьшения эмиссии газов и частиц – продуктов горения в земную атмосферу		*Укажите список / названия документов*
Использование огня в отношении увеличения биоразнообразия или запрет на использование огня с целью уменьшения повреждения биоразнообразию		*Укажите список / названия документов*
Штрафы виновникам возникновения пожаров или незаконное применение огня в землепользовании		*Укажите список / названия документов*
Протоколы, соглашения по трансграничным пожарам с соседними странами (национальный и / или провинциальные (региональные) соглашения)		*Укажите список / названия документов* Примечание: см. также вопрос XII
Другие		

(III) Ведомственные полномочия в управлении пожарами

Перечислите различные агентства (ведомства), административные органы, землевладельцев или групп гражданского общества, ответственных за управление пожарами.

Категории земель	**Ведомство, администрация или землевладелец, ответственный за предотвращение пожаров**	**Ведомство, администрация или землевладелец или группы добровольцев ответственные за тушение пожаров**	**Комментарии (например, текущие планируемые институциональные реформы или изменение полномочий)**
Леса			
Земли сельскохозяйственного назначения			
Охраняемые территории			
Другая растительность (неплодородные земли; заброшенные земли / паровые)			
Приграничные участки между естественной природной растительностью или с/х земель с сельскими поселениями, деревнями, фермами и другими отдельными зданиями и инфраструктурой в сельской местности			
Земли министерства обороны или земли примыкающие к государственным границам			
Другие			

(IV) Проведение профилактических выжиганий

В некоторых естественных типах растительности (леса, другие земли) пожары возникающие в результате молний или выжигания проводимые целенаправленно людьми играют существенную роль в формировании растительного состава разновидностей и функционировании экосистем. В некоторых культурных территориях, которые включают пахотные земли, пастбищные угодья и также лесные экосистемы, огонь использовался традиционно, чтобы облегчить землепользование или повысить производительность и биоразнообразие. Пожалуйста, перечислите существующую практику, правовые основы, и возможное будущее вовлечение вариантов управления пожарами и использования огня в указанных целях.

Тип использования земель или определенные управленческие цели	**Осуществляется ли использование огня в практике? (да / нет)**	**Использование огня разрешено законом или запрещено?**	**Управленческие цели и практика (Пояснения) (пожалуйста, укажите также возможную выгоду применения огня, даже если в настоящее время использование огня еще не разрешено или явно запрещено)**
Леса естественного происхождения (удаленные территории, резервные леса)			
Леса, где проводится интенсивное ведение лесного хозяйства			
Лесные культуры			
Земли сельскохозяйственного назначения			
Пастбища			
Заброшенные сельскохозяйственные и пастбищные угодья			Примечание: см вопрос V
Особо охраняемые природные территории (охраняемые территории, включая под эгидой ЮНЕСКО и / или места культурного наследия)			
Управление природными землями (пейзажами)			
Свалки			
Другие природные территории			

(V) Управление пожарами в заброшенных территориях сельскохозяйственного назначения и пастбищах

Как следствие сельского массового переселения (урбанизации населения) на всей евразийской территории, все далее оставляются прежде обрабатываемые земли. Это приводит к зарастанию культивируемых ранее земель, накоплению легко воспламеняемой растительности, дефрагментации культурных пейзажей, и таким образом к увеличению опасности на этих территориях развития катастрофических пожаров. Сокращение и старение остающегося сельского населения приводит к исчезновению сельской рабочей силы, способной защитить сельские территории от пожаров. Пожалуйста опишите кратко ситуацию в своей стране.

Переселение сельского населения и оставление земель	**Действительно ли это - соответствующая проблема, относительно природных пожаров? (да / нет)**	**Краткое описание**
Сокращение населения в удаленных территориях (Землях традиционного сельхозпользования)		*Укажите демографические проблемы и тенденции переселения; исчезновение ферм или деревень*
Превращение территорий в земли с более высокой пожароопасностью (по сравнению с прежде обрабатываемыми землями)		*Укажите, подвергнуты ли заброшенные поля к увеличению пожарнойопасности*
Мониторинг изменения землепользования (космическими или наземными методами)		Укажите *способы мониторинга / статистические данные (примеры)*
Политика или нормативное регулирование об использовании, восстановлении или экологическом восстановлении сельскохозяйственных заброшенных земель и пастбищных угодий		***Основные правила или принятые меры***
Определенные усилия относительно восстановления / экологического восстановления заброшенных территорий с целью возобновления использования земель (культивации или природных экосистем) и / или уменьшения угрозы возникновения пожаров (например, прежде использованные заболоченные места / торфяники)		*Пояснения*

Полномочия за управление огнем на заброшенных землях		*Агентство/ ведомство, ответственное за пожарную безопасность*
Увеличение среднего возраста сельского населения, снижение доступной молодой рабочей силы		*Укажите проведение учета / статистические данные (или примеры)*
Уменьшение сельских фермеров или добровольцев, привлекаемых для предотвращения и тушения пожаров		Описания
Признание проблем основанных исследованиями и публикациями или определенными мерами, относительно проблем пожаров и решений для управления пожарами на заброшенных территориях		*Укажите ссылку на материалы (с их приложением)*
Опишите определенную угрозу сельскому населению и инфраструктуре от пожаров, возникающих на заброшенных землях (например, типичные деревянные структуры, которым угрожают пожары в населенных районах)		*описания*
Другие соответствующие меры по обслуживанию или восстановлению среды обитания (например, восстановление пастьбы скота или проведение профилактических выжиганий)		*описания*
Другие соответствующие проблемы		*Пожалуйста добавьте*

(VI) Эмиссия от природных пожаров: Воздействие на здоровье человека и безопасность

Эмиссия от пожаров в лесах, торфяниках и растительности, а также эмиссии от сельскохозяйственных выжиганий затрагивает здоровье людей и безопасность в целом. Пожалуйста укажите опыт, примеры и правовые основы.

Эмиссии дыма от природных пожаров: Здоровье людей и обеспечение безопасности	**Это актуально в Вашей стране? (да / нет)**	**Краткое описание**
Есть ли у вас законы или требования, которые регулируют использование огня относительно защиты здоровья людей и безопасности в целом?		*Перечислите список / источники документов:*
Пояснения или статистика основных эпизодов загрязнения воздуха от природных пожаров		*Описания или статистика*
Госпитализации и преждевременные смертельные случаи во время засухи и эпизодов катастрофических пожаров (в сельской местности и городах)		*Описания или статистика*
Транспортные происшествия из-за ухудшения видимости от пожаров (автомобильные дороги, железная дорога, морской и воздушный транспорт)		*Описания или статистика*
Меры подготовки и информирования населения о задымленности или загрязнении воздуха радиоактивными элементами (предупреждение или сообщения о эвакуации, другие предупредительные меры, чтобы защитить общественность от опасного воздействия дыма от лесных пожаров)		*Процедуры*
Есть ли у вас определенные рекомендации ведомств для реагирования в случае задымленности населенных пунктов от природных пожаров (общественные оповещения, предоставление соответствующих защитных средств, убежищ)		*Укажите список / источники рекомендаций или инструкций:*
Другие соответствующие проблемы		***Пожалуйста добавьте***

(VII) Эмиссия от природных пожаров: Воздействия на окружающую среду

Эмиссия от пожаров в лесах, торфяниках и других типах растительности, а также эмиссии от сельскохозяйственных выжиганий затрагивает местную, региональную и глобальную окружающую среду. Например атмосферу, климат или поверхностный коэффициент отражения солнечной радиации. Пожалуйста укажите опыт и примеры из вашей страны.

Эмиссия дыма от природных пожаров: Экологические особенности	**Это актуально в Вашей стране? (да / нет)**	**Краткое описание**
Есть ли у вас законы или нормативные требования использования огня относительно: - защиты атмосферы (например, “сокращение парникового газа”) - переноса частиц в атмосфере (например, переноса черного углерода) - сжигания отходов / закапывания мусора (Примечание: см. также Вопрос X)		*Описания*

(VIII) Воздействия природных пожаров на экономику

В некоторых странах, лесные и другие природные пожары приводят к значительным экономическим убыткам. Пожалуйста, укажите основные убытки и ущерб в Вашей стране (например, по отдельным чрезвычайным годам или долгосрочным статистическим данным, при наличии).

Экономические убытки	**Это актуально в Вашей стране? (да / нет)**	**Краткое описание (примеры и статистические данные если имеются)**
Прямые убытки в системах землепользования, например: - потеря сельскохозяйственных зерновых культур / плантации - потеря домашнего скота - другое		*Описания/ примеры / статистика*
Косвенный / вторичные повреждения, например: - нарушения земель и селевые потоки - наводнения - ухудшения качества воды - заражения продуктов дымом (например, виноградарство) - другое		*Описания/ примеры / статистика*
Инфраструктура и объекты экономики в сельской местности, например: - здания - служебные постройки (сараи, склады) - заборы и другое - телеграф / телефонные столбы - электроснабжение - железной дороги - другое		*Описания/ примеры / статистика*
Инфраструктура и объекты экономики расположенные между лесными землями / другой растительностью и городскими / жилыми районами, например: - здания - индустриальные и другие компании - другое		*Описания/ примеры / статистика*
Другие соответствующие проблемы		***Пожалуйста добавьте***

(IX) Человеческие жертвы и травмы

С 2008 года Центр глобального мониторинга пожаров собирает и публикует ежегодный отчет несчастных случаев от природных пожаров (с 2011 также включая другие экономические потери). Эти отчеты к сожалению неполные из-за нехватки национальных докладов и непоследовательных отчетов в СМИ. Пожалуйста, предоставьте краткую информацию о крупных потерях, трвмах и ущербе или (при наличии) статистических данных.

Человеческие жертвы и травмы	**Это актуально в Вашей стране? (да / нет)**	**Краткое описание (примеры и статистические данные если имеются)**
Человеческие жертвы или травмы от природных пожаров, например по группам: - профессиональные и добровольные пожарные - другие жертвы из числа гражданской обороны или персонала вооруженных сил - гражданские лица		*Описания/ примеры / статистика*

(X) Определенные проблемы пожаров в лесах и других природных территориях, загрязненных радионуклидами, химическими и другими индустриальными выбросами, невзорвавшимися снарядами, минами и безконтрольными отходами.

В отдельных регионах стран Европейской экономической комиссии ООН загрязненных индустриальными отходами или катастрофами (включая радиоактивное загрязнение), вооруженные столкновения (оставившиеся невзорвавшиеся снаряды или мины) и несанкционированные свалки, являются источником риска возникновения и развития пожаров. Пожары в загрязненных ландшафтах могут повлечь дополнительные риски для людей, особенно пожарных. Пожалуйста, укажите кратко существование такой проблемы в вашей стране.

Тип растительности / загрязнение территорий	**Общая площадь (га)**	**Определенные опасности, затрагивающие человеческую и экологическую безопасность / безопасность (включая побочные эффекты)**	**Описание чрезвычайных событий и меры предотвращения и тушения опасных (катастрофических) пожаров**
Радиоактивность			
Химические и другие индустриальные отходы			
Невзорвавшиеся снаряды			
Мины			
Другое (например, несанкционированные свалки / скопления мусора) (см. также Вопрос VII)			

(XI) Трансграничные пожары

Проблемы пожаров действующих возле границ или пересекающих границы, а также дым от природных пожаров, переносимый через государственные границы, является основанием, чтобы обсудить международные правила, региональные или двусторонние соглашения (см. также следующий вопрос XII). Пожалуйста, перечислите страну (или страны) с общими с вами государственными границами и любым предыдущим опытом или потенциальным риском перехода пожаров через государственную границу или переноса дыма от пожаров.

Международные проблемы	**Описания**
Трансграничные пожары (Из какой страны в какое государство?)	
Трансграничный перенос дыма	
Пожары уничтожающие приграничную инфраструктуру	

(XII) Двусторонние или региональные соглашения сотрудничества в управлении пожарами, включая обмен людскими и техническими ресурсами при ликвидации чрезвычайных ситуаций связанных с природными пожарами

Предоставьте информацию о двусторонних или многосторонних протоколах, которые регулируют международное сотрудничество в управлении пожарами с другими странами.

Тип трансграничного или международного сотрудничества	**Описания**
Перечислите любой протокол или юридическое соглашение на двустороннем уровне, регулирующем трансграничное сотрудничество в управлении пожарами	
Есть ли у вашего государства стандартные процедуры или протоколы, которые регулируют детали взаимной помощи (то есть для получения и оказания помощи) в чрезвычайных ситуациях связанных с пожарами (или при других подобных чрезвычайных ситуациях), при которых например, имеются соглашения по обязанностям, обязательствам, страхованию, разделению стоимости затрат, обеспечению связи или управлению при ликвидации чрезвычайной ситуации?	Да / Нет Описания

Применяет ли ваше государство систему руководства тушением пожаров (другим происшествием) (Incident Command System (ICS) на национальном уровне?	Да / Нет Описания
Имеет ли ваша страна обмен опытом управленческим персоналом с другими странами (регулярные или единичные случаи обмена информацией, обучение или подготовка)?	
Укажите перечень случаев помощи вашей страной другим странам во время чрезвычайных ситуаций связанных с пожарами за последние10 лет (дата, принимающая помощь страна, направленные силы и средства, источники отчетов, оценка оказания помощи, и т.д.). Примечание: Если возможно, этот список должен включать поддержку, предоставленную через механизм Гражданской обороны Евросюза.	
Укажите перечень случаев помощи, которую Ваша страна получила из других стран во время чрезвычайных ситуаций связанных с природными пожарами в вашей стране за последние 10 лет (дата, страна обеспечившая помощь, принятые силы и средства, источники отчетов, оценка оказания помощи, и т.д.). Примечание: Если возможно, этот список должен включать чрезвычайную поддержку, предоставленную через механизм Гражданской обороны ЕС.	

(XIII) Подготовка руководящего состава по управлению природными пожарами

Во многих государствах-членах Европейской Экономической Комиссии ООН ответственность за борьбу с природными пожарами возложена исключительно на Противопожарные службы и Спасательные службы. В чрезвычайных ситуациях может быть вовлечен персонал гражданской обороны и вооруженных сил. Некоторые государства-члены ЕЭК используют специализированные лесопожарные службы. Специальное обучение персонала руководящего состава и особенно самих пожарных требуется, чтобы гарантировать профессиональные, безопасные и эффективные противопожарные операции при тушении природных пожаров.

Обучение по руководству тушением природных пожаров	**Описания**
Есть ли в вашей стране специализированные пожарные службы для тушения природных пожаров, которые имеют специальную подготовку и стандарты квалификации?	Да / Нет Описания
Если ответственность за тушение природных пожаров возложена на гарнизоны противопожарных и спасательных формирований: Имеют ли эти службы и работники определенные навыки и квалификацию для тушения природных пожаров?	Да / Нет Описания
Какое обучение требуется в Вашей стране для лиц участвующих в тушении природных пожаров?	
Осуществляете ли вы обмен опытом с другими странами в области подготовки кадров по тушению природных пожаров?	Да / Нет Описания
Используете ли вы материалы обучения управленческих кадров по тушению природных пожаров, идентичные с методологией соседних государств или других стран, чтобы облегчить обмен опытом?	Да / Нет Описания
Ваша страна была бы готова принять управленческих кадров по тушению природных пожаров из других стран, для совместной работы с вашими собственными управленческими специалистами по руководству тушением пожаров во время ликвидации средних или крупных пожаров с тем, чтобы они получили опыт в руководстве тушением?	Да / Нет Описания

И наоборот - было ли бы интересно вашей стране посылать управленческих специалистов по природным пожарам в другие страны, чтобы работать с руководящими специалистами по пожарам в других странах во время ликвидации средних или крупных пожаров с тем, чтобы они получили опыт в руководстве тушением?	Да / Нет Описания
Гендерные аспекты: участвуют ли активно в вашей стране женщины при приеме на работу и /или позже в тушении пожаров и спасательных службах? Если да, укажите соотношение (%).	Да / Нет Описания

(XIV) Пожарные добровольцы

Пожалуйста, опишите меры относительно противопожарных сил добровольцев и их обязанностей указанных ниже.

Добровольные пожарные	**Описания**
Имеете ли вы добровольных пожарных? Если да, сколько?	Да / Нет Описания
Вовлечены ли в полном объеме бригады добровольных пожарных на тушении лесных и других природных пожаров?	Да / Нет Описания
Обучение / стандарты квалификации добровольцев совместимые ли с теми, что имеют профессиональные пожарные?	Да / Нет Описания
Защищены ли добровольные пожарные теми же самыми юридическими и страховыми механизмами как профессиональные пожарные?	Да / Нет Описания
Получают ли добровольные пожарные или их работодатели по основному месту работы вознаграждение за потерю их дохода за время противопожарных операций?	Да / Нет Описания
Источник финансирования для поддержки добровольных пожарных	Описания
Типы оборудования, используемого добровольными пожарными бригадами	Описания
Гендерные аспекты: Участвуют ли женщины активно при наборе добровольцев (подготовке) и / или позже в активных противопожарных операциях в качестве добровольцев? Если да, укажите пропорцию (%).	Да / Нет Описания

(XV) Участие гражданского общества, особенно местных сообществ, в предотвращении пожаров, подготовке к тушению и самозащите от природных пожаров

В осваиваемых территориях умеренной Евразии подавляющее большинство пожаров вызваны людьми, преобладающе как последствия сельскохозяйственных и других выжиганий; остальные антропогенные причины пожаров связаны с неосторожным обращением с огнем и другими причинами. Возникновение пожаров можно сократить, смягчить ущерб от пожаров посредством активного участия сельского населения в предотвращении пожаров, защитить природную среду (сельскохозяйственные земли, сады и леса, а так же дома, служебные постройки и инфраструктуру) от пожаров. Кроме роли добровольцев по тушению с/х пожаров сельское гражданское общество играет важную роль в предотвращении пожаров и тушению пожаров в ранней стадии, пока подразделения противопожарных служб прибудут для тушения.

Участие гражданского общества и особенно местных членов сельской общины в управлении пожарами	**Описания**
Имеется ли некая программа, нацеленная на информирование широкой публике о том, как они могут предотвратить пожары, такие как советы относительно фермерской деятельности или во время пребывания на природе?	Да / Нет Описания
Как широкой публике сообщают о событиях во время чрезвычайной ситуации с пожарами, таких как информирование об эвакуации?	Да / Нет Описания
Есть ли у вас система для того, чтобы сообщить широкой публике о том, как они могут избежать природных пожаров, способных повредить их строения и др.собственность?	Да / Нет Описания
Есть ли у вас специальная поддержка и программа для совершенствования мероприятий по защите деревень, ферм и других сельских объектов от природных пожаров?	Да / Нет Описания
Есть ли у вас специальная программа для защиты объектов экономики расположенных на участках между природными и городскими (сельскими) территориями?	Да / Нет Описания
Другие соответствующие проблемы, не упомянутые в этом анкетном опросе	Описания

(XVI) Использование современных национальных, региональных и глобальных данных и информационных систем для применения в управлении природными пожарами

Увеличивающееся разнообразие коммерческих и находящихся в свободном доступе систем/ услуг обеспечивает спутниковые и наземные данные о наблюдении Земли (например, гидрометеорологическая информация), а так же моделирование инструментов (от краткосрочного - к среднесрочному и долгосрочному моделированию климата).

Использование современных национальных, региональных и глобальных данных и информационных систем	**Описания**
Есть ли у вас национальная шкала пожарной опасности / система раннего оповещения и система контроля? Пожалуйста, укажите детали и / или источник в онлайн.	Да / Нет Описания
Есть ли у вас национальная система (спутниковая или наземная) для обнаружения пожаров и / или система мониторинга в целом? Пожалуйста, укажите детали и / или источник в онлайн.	Да / Нет Описания
Используете ли вы региональные и глобальные системы обнаружения пожаров, наблюдения за действующими пожарами и системы мониторинга вместо недостающей национальной системы?	Да / Нет Описания
Как вы сообщаете общественности о классах пожарной опасности и какую информацию им предоставляете?	Описания
Развивала ли ваша страна или рассматривала ли модели изменения климата для того, чтобы запланировать дальнейшие действия, например, в национальной политике управления пожарами или стратегическом планировании?	Да / Нет Описания
Другие соответствующие проблемы, не упомянутые в этом анкетном опросе	Описания

(XVII) Исследование пожаров с целью применения в управлении огнем

Информированные управленческие решения по природным пожарам основываются на современных технологиях и науке (например, климатологии / науке о изменении климата). В регионах ЕЭК ООН способности и акцент специального национального исследования по природным пожарам изменяются и могут не покрыть весь спектр исследований. Это призывает к обмену научно-технической информацией и гарантирует уместность и качество для поддержки принятия управленческих решений.

Будущее нуждается в исследовании пожаров для применения в управлении огнем	**Описания**
Есть ли у вас специальный отдел или управление в области исследования природных пожаров (в университетах, академиях или других государственных или частных организациях)? Пожалуйста, рассмотрите разные уровни от национального до местного	Да / Нет Описания
Понятия управления природными пожарами действительно ли основаны на современной науке?	Да / Нет Описания
Перечислите любые потребности исследования, необходимые с учетом ожидаемых изменений в будущем в связи с природными пожарами.	Описания
Другие соответствующие проблемы, не упомянутые в этом анкетном опросе	Описания