Interreg - IPA CBC
CCI 2014TC16I5CB006

Study of the most vulnerable areas in the Municipality of Dupnitsa

This project sets out the parameters of behavioral ignorance regarding risk management in the community to help draw up an action plan for greater awareness and provide tools for timely and adequate response

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Contents

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Introduction

Urban and forest fires represent a natural or man-made recurring risk with greater consequences for the population.

There are different types of fires and they can be caused by different things and can happen at any time and in any place. Everyone in a community should be aware of fire safety, and even if you do not work with flammable materials, there is a risk of causing a fire.

Fires can spread from forest to urban and cover residential buildings, yards, parks or vice versa - spread from residential or yard areas, to spread in forest or field.

The effects of redevelopment, lack of vacant urban space, drastic reduction of artificial lakes and water areas in urban areas, lead to increased risk of fires and growing concern, both for environmental damage caused by fires and for endangering property and human life.

Research shows that the actions taken by the population to protect them, training, information, reduce the cost of firefighting.

It is therefore essential to hold information events and training from an early age. To study from the population the factors that influence the potential impacts on it, the sources of fire and ways to protect the community.

These aspects are related in relation to natural disasters and in particular fires under the term "vulnerability".

Studies on social vulnerability to urban and forest fires show that the more socially vulnerable population has less capacity to implement fire mitigation and recovery measures.

In this sense, there is still a lack of knowledge about how social vulnerability is affected by management decisions in forest and field areas and urban areas.

After a disaster, the sustainability of societies depends not only on the income of individuals, but also on age and health status, leading to the concept of environmental justice.

The aim of the work is to identify the vulnerability of the population and the areas in the town of Dupnitsa susceptible to fires.

We use socio-economic and demographic variables at the municipal level to construct an index of spatial social vulnerability that can identify the most vulnerable areas to fire. The resulting map can be used to identify specific places where improvements in preparedness capacity and social resilience to natural risks can be implemented.

1. Identification of the areas prone to fire within the town of Dupnitsa

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

1.1 Understanding the risk

The mayor of Dupnitsa, municipal officials and decision-makers are at the forefront of dealing with the impact of disasters - ranging from small to medium to rare large-scale events - arising from natural or man-made hazards. Climate change and extreme weather events are likely to increase the city's exposure to dangers and risks. Less obvious is the fact that the business itself, with its activities and development, can also generate complex changes in the environment and contribute to increased risk, unless they take corrective action.

As one of the first responders to disasters, local authorities sometimes face wide- ranging responsibilities that require certain skills to deal with. They are probably the first institutions to respond.

This is achieved by setting up an early warning system and setting up specific disaster management organizations and structures.

It is important to look at the elements of risk in order to understand how disasters develop. Risks are a function of the hazard (eg storm, earthquake, flood or fire), the exposure of people and assets to hazards and the conditions of vulnerability of the exposed population or assets. These factors are not static and can be improved depending on the institution and individual capacity to deal with and / or act to reduce risk and increase resilience. Development models can increase exposure and vulnerability in the social and environmental spheres and therefore create new risks.

The urbanization of Dupnitsa municipality provides opportunities for sustainable development. At the same time, the physical and spatial characteristics of the city are some of the elements of risk that increase the vulnerability of the population and critical infrastructure. One of the goals of the work is to move to safe and sustainable urban development and minimize the risk of fires.

Rapid urbanization puts pressure on the territory and services provided if it is not met with sustainable planning and development. This often leads to settlement in endangered areas, such as in floodplains, on unstable and steep slopes, storage of combustible hazardous materials, lack of clearings in forest areas. Disaster-affected populations, especially in suburban areas , often lack resources for disaster recovery as well as limited post-disaster mobility. The percentage of insurance "Fire, natural disasters and property damage" is relatively low. The contribution of insurance companies to risk reduction and adaptation to climate change in Bulgaria, as well as the insurance mechanisms used by the state, are still unsatisfactory. The lack of a culture of the insured is a major challenge for insurance companies, as it indicates a relatively weak and insufficient demand for insurance products. In addition, the lack of incentives in the form of compulsory insurance also hinders the development of the insurance sector and its potential to respond to the expected increase in disasters [1]. In the first three months of 2020 са benefits от type застраховка „ Пожар , приподни

[1]Financial management of disaster risk and insurance opportunities for adaptation to climate change in Bulgaria, https://www.moew.government.bg/static/media/ups/articles/attachments/Insurance_Against_Climate_Change

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

disasters and others damages on property ", whose share is 15.2%. This type of package покрива indyctpialni fires , farmers застраховки , застраховка ппи vandalism and vandalism _ _ on animals [2].

In the event of a disaster, the victims without insurance can only rely on assistance from the Interdepartmental Commission for Reconstruction and Assistance to the Council of Ministers, which is minimal in the event of actual damage.

At the municipal level, urban expansion also has detrimental effects on ecosystems. The degree of impact of hydrometeorological hazards and increasing the risk of fires is increasing. Deterioration of the environment caused by pressures from urbanization, deforestation or inadequate agricultural management can lead to an increased risk for the city. In addition, climate change is expected to affect not only the intensity and frequency of extreme weather and hydrometeorological events, but also to increase the "risks of heat stress, storms, extreme rainfall, floods, landslides, air pollution, drought, water shortages and fires - urban and forest.

The relief of the Municipality is mountainous and semi-mountainous. This relief determines the possibility of forest and field fires from natural disasters - storms and lightning, as well as human negligence. Due to the highly urbanized area, there is a real risk of fires in the central part of the city.

In FIG. 1 shows the geographical map of Dupnitsa municipality.

[2] https://www.economic.bg

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

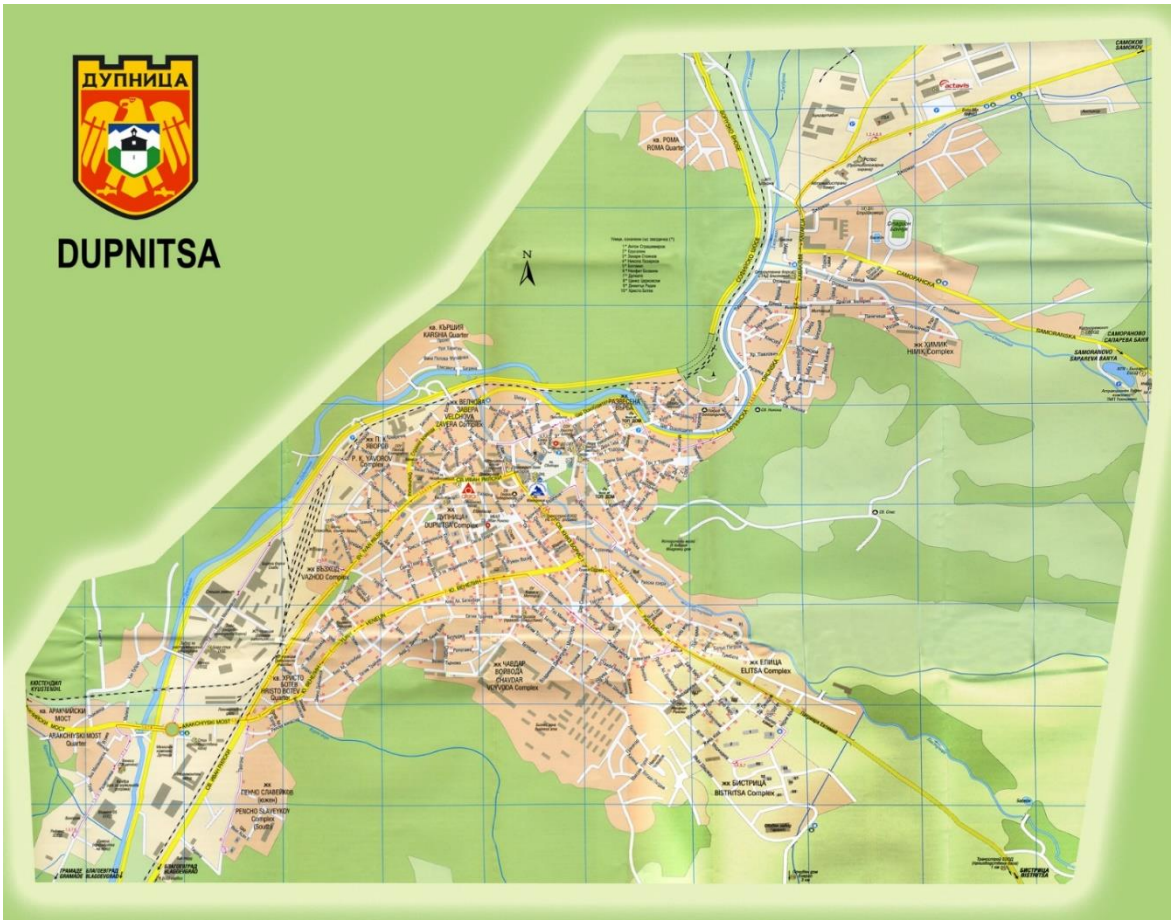


FIG. 1 Municipality of Dupnitsa, source: https://dupnitsa.bg/

On the territory of the municipality there could be a complicated or crisis situation in the event of mass forest fires.

On the territory of the Municipality of Dupnitsa falls part of the RILA National Park (Fig. 2) with a total area of 81046 ha. Rila National Park is one of the most important protected areas for fauna in Bulgaria and Europe. It covers the mountainous parts of the lands of the villages of Samoranovo and Bistritsa.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

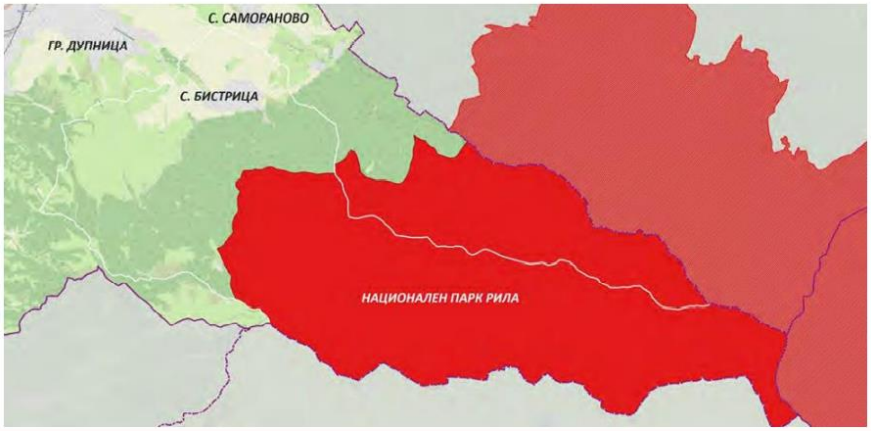
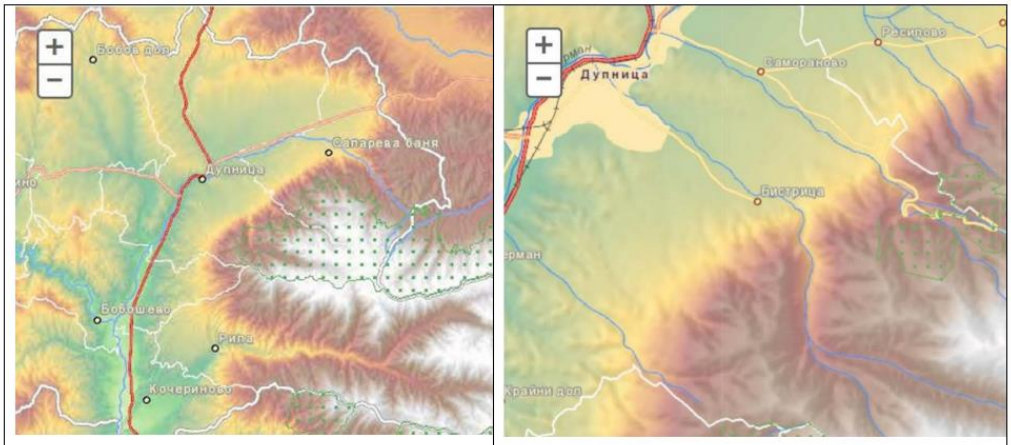


FIG. 2 Rila National Park on the territory of Dupnitsa municipality, source SFE Blagoevgrad

The following protected areas fall on the territory of Dupnitsa municipality according to the data of the Information Network for protected areas under the ecological network NATURA 2000 (Fig. 3):



Защитена зона Рила с идентификационен код BG0000495, приета с решение на Министерски съвет № 122 от 02.03.2007 г. , обн. в ДВ бр. 21 от 09.03.2007 г. с обща територия: 77927.18 ха	**Защитена зона Ниска Рила** с идентификационен код BG0000636 за опазване на природните местообитания и на дивата флора и фауна, одобрена с решение на МС № 177 от 3.04.2019/ ДВ бр. 29 от 8.04. 2019, с обща територия 37 192 ха

FIG. 3 NATURA 2000 protected areas under the Habitats Directive. Source: DUPNITSA MUNICIPALITY INTEGRATED DEVELOPMENT PLAN 2021-2027

The occurrence of mass forest and field fires can occur in almost all areas in the municipality of Dupnitsa.

The situation will be especially complicated in case of fires in the forests of Rila Park, due to the difficult terrain and lack of water bodies for firefighting, as well as in the Polish regions and neglected landfills and illegal landfills for secondary raw materials.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Particular attention should be paid to fires occurring in sites characterized by the release of a more limited or wider spectrum / bouquet / of toxic gases. Such are the sites for storage, trade and transportation of petroleum products / gas stations, gas stations /, etc.

1.2 Structure of the settlement network

The settlement network of the municipality of Dupnitsa is an administratively organized spatially located set of settlements and territories, interconnected through various economic, social, infrastructural, service or information links, as well as through the community of nature management .

Settlements of the municipality consists of 17 settlements (one town and 16 villages. The density of the settlement network is close to the national average (5.1 compared to 5 for the country per 100 km ^{2}).

75.4% of the population of the municipality, 67% of the residential buildings and a large part of the main production and non-production funds are concentrated in the city.

All settlements in the municipality are depopulated. The downward trend in population is primarily due to negative mechanical growth and increased migration to larger urban centers, as well as abroad. Some of the settlements in the municipality have a critical demographic mass. There is a clear imbalance between the ratio of young people (under working age) to people of retirement age. In the municipal center 59% of the population is of working age, and in the villages 55%. In total on the territory of the municipality the young people are 2 times less than the people over working age. The aging of the population is strongly manifested in the villages, as is the trend on the territory of the country. Gramade, Kremenik, Kraini dol have the most deteriorating age structure.

According to the current urban categorization , the settlements are grouped as follows:

- Dupnitsa - town, center of the Municipality;

- Yahinovo, Kraynitsi, Samoranovo, Bistritsa, German and Cherven Breg - six

large villages;

- Balanovo, Topolnitsa, Palatovo, Dyakovo, Piperevo, Blatino - seven small

villages;

- Gramade, Kremenik, Kraini dol - three very small villages.

The settlement system of the municipality is shown in Fig. 4

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Fig.4 Settlement network in Dupnitsa municipality. Source: Plan for integrated development of Dupnitsa municipality 2021-2027

1.3 Housing sector

In the municipality of Dupnitsa by 2019 24073 homes were built with 1794418 sq.m usable area and 1576357 sq.m. living area. Nearly 70% of the homes in the municipality are built in the municipal center - the town of Dupnitsa. Table 1 shows the distribution of living space at the end of 2019.

Table 1. Dwellings and useful floor area of dwellings as of 31.12.2019 source NSI

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Община	Жилища общо	Полезна площ на жилищата			Полезна площ на човек от населението	Жилищна площ на човек от населението	Спомагателна площ на човек от населението	Средна полезна площ на едно жилище
Място намиране		Общо	Жилищна	Спомага-телна				
Общ. Дупница	**24073**	**1794418**	**1576357**	**218061**	**46.4**	**40.8**	**5.6**	**74.5**
В гр.Дупница	16551	1248445	1096658	151787	42.9	37.6	5.2	75.4
В селата	7522	545973	479699	66274	57.4	50.4	7.0	72.6
Обл. Кюстендил	**86926**	**6290324**	**5476058**	**814266**	**53.8**	**46.8**	**7.0**	**72.4**
В градовете	46073	3513277	3060719	452558	42.9	37.4	5.5	76.3
В селата	40853	2777047	2415339	361708	79.3	69.0	10.3	68.0

A significant part of housing is currently uninhabitable as a result of intensive emigration of economically active population over the past 25 years. The number of newly built homes is also declining sharply. As a result of the weak market demand for residential real estate and other types of property, liquidity and, respectively, real estate prices in the city are low, which is another negative indicator [3].

1.4 Structure of residential buildings according to construction

According to the type of construction, the housing stock by 2019 is presented in four generalized categories - panels, reinforced concrete, brick with concrete slab and brick with joists.

The panel dwellings in the municipality are nearly 12.4% (2980 units), the predominant part of them built in the town of Dupnitsa. Reinforced concrete dwellings are 3.7% (883 units). The category “brick with concrete slab” is the most common type (55.0% - 13251 units) of all dwellings. Brick dwellings with joists are 27.0% of the dwellings in the municipality, as their share is higher in the villages (35.7%), while in the cities it is 23.0%. 1.9% of the dwellings in the municipality have another type of construction, incl. in the cities their share is 1.0%, and in the villages - 3.9%.

Excluding the municipal center, in the other settlements of the municipality of Dupnitsa the housing stock consists mainly of low- rise buildings for single-family living, which are of massive or semi- massive construction.

Unfortunately, in the conducted interviews with residents of the municipality in almost no single-family house or apartment there is no construction of a fire alarm system, which leads to a risk of fires in urban areas.

[3] Draft General Development Plan of Dupnitsa Municipality

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.

2. Predicted hazards and disturbances in climate change: types, nature of dependencies, mutual relief / strengthening, frequency, magnitude, scope, etc.

As part of its strategy for the period 2021-2027, the municipality of Dupnitsa should envisage and implement actions to mitigate and adapt to the effects of climate change. The envisaged measures take into account the specifics of the municipal territory, aiming to provide prevention of the expected risks, as well as to address the solution of existing problems for the municipality.

Due to the existing link between the development of landslides and the occurrence of fires, this issue should be considered.

The main risks associated with climate change are:

Activation of landslides due to more intense rainfall. On the territory of Dupnitsa municipality there are a total of:

- 5 pcs. active landslides (№№ 1, 2, 3, 4 and 9 of Figure 27)
- 4 pcs. stabilized landslides (№№ 5, 6, 7 and 8 of Figure 5)
- 5 pcs. potential landslides (№№ 10 to 14 of Figure 5)

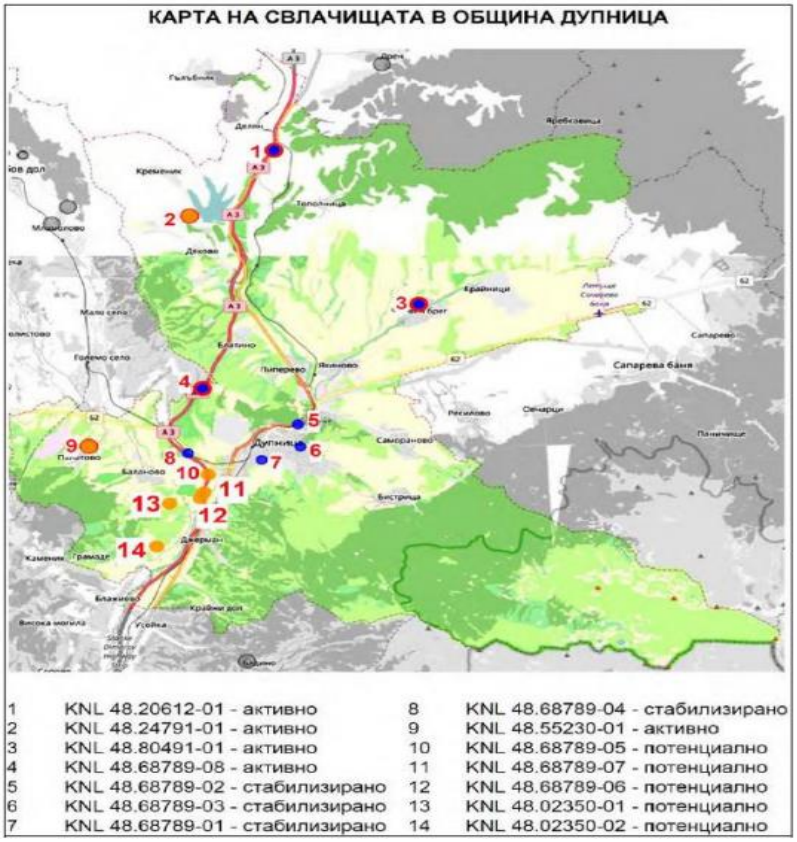


FIG. 5 Map of landslides in Dupnitsa municipality. Source of the Ministry of Regional Development and Public Works

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

High air temperatures, combined with rainfall deficits during the summer season will lead to higher values of transpiration and evapotranspiration during this time of year. All this will increase the risk of drought and the possibility of forest fires.

According to the calculated EU-wide Climate Change Vulnerability Index (NUTS 2), the South West region falls into the fourth group with high vulnerability. The most sensitive sectors to climate change are agriculture, tourism, water management and forestry.

The impact of global climate change is most pronounced at average annual temperatures and average annual rainfall. Regarding the temperature for SWR, as well as for the whole country, an increase in the average annual temperature is expected, as this increase is about 1.5-2 ^{o}C for the near future and between 2.5 and 3.5 ^{o}C for the distant future.

According to the National Strategy for Adaptation to Climate Change until 2030, the following strategic goals are set:

Inclusion and integration of adaptation to climate change;

Building institutional capacity to adapt to climate change;

Raising awareness of adaptation to climate change;

Building resilience to climate change

The National Disaster Risk Reduction Strategy 2018-2030 sets out the following four strategic objectives:

1. Achieving societal resilience to disasters.

2. Capacity building for disaster risk management at all administrative levels of government.

3. Achieve coherence in the implementation of sustainable development policies, adaptation to climate change and disaster risk reduction.

4. Achieving sustainability of disaster protection funding.

3. Sensitivity of existing sectors of society to forecasted hazards and disturbances with a focus on fires

Forest and urban fires are a problem for the Municipality of Dupnitsa and the creation of effective prevention and early warning systems are crucial to reduce impacts and losses. Fire time indices are daily fire hazard indicators based on meteorological information. However, their application in many studies is due to the availability of sufficiently large climatological time series of sufficient quality. In addition, wind and relative humidity important for the calculation of the parameters of fire propagation and fuel flammability are relatively scarce data.

The industrial sectors in the municipality of Dupnitsa, as well as the residential buildings - single-family houses or apartment blocks are exposed to the dangers of fire and gassing by the products of combustion.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

With regard to transport infrastructure, no matter how well developed it is with regard to highways and primary roads, they hide their risks, mainly with regard to illegal storage of waste materials, illegal depots for car tires and others.

The existence of a dark tunnel at the entrance to the city is a prerequisite for accidents and fires.

In healthcare facilities, existing oxygen supply systems pose a risk of ignition caused by a technical malfunction or by patients or staff who smoke.

Spark fires, engine ignition of stubble or criminal activity can occur when machinery is used in the fields.

Lack of fire alarm systems or smoke alarms in private homes can lead to delays in submitting information about a fire.

From the analysis of social vulnerability to forest fires in the municipality of Dupnitsa, we found clusters with high vulnerability and high risk of forest fires. This information is potentially important as it identifies those places in the region where efforts to improve preparedness can be targeted, leading to increased social resilience to forest fires. Further analyzes may be developed in the future, including the identification of location hotspots for both social vulnerability to natural hazards and forest fire risk.

3.1 Socio-economic trends related to the sensitivity of society

As a common problem of the country related to national security is a socio -demographic crisis, which is able to destroy any potential for a better future of a society. Every year the crisis deepens. According to UN data, the population in Bulgaria in 1989 was nearly 9 million, and in early 2018 - just over 7 million. If this trend continues, the population of Bulgaria in 2050 is expected to be about 5.5 million and in 2100 about 3.8 million. The opposite trend is emerging among the Roma population. There are no exact statistics of those who left the country, but according to various indirect estimates, they are about 2.5-3 m . people since the beginning of the transition.

The reasons for this crisis are numerous - the search for a better and more meaningful life, professional realization, high levels of domestic crime and corruption. The deteriorating quality of health care, education, the lack of a purposeful family policy on the part of the state, has seriously reduced the birth rate. The data on the mortality and socially significant diseases of the Bulgarians are alarming. Bulgaria also holds the first place in terms of mortality in the European Union.

All this has a detrimental effect on our economic development. There will be less and less in the country not only skilled, but in general labor and, accordingly, its economic potential will stay at a low level, with a downward trend. The age structure of the population is changing dramatically. An increasing social and economic burden will have to be borne by fewer and fewer people. This will inevitably lead to negative effects on the social security and pension systems.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Problems with the lack of adequate inclusion and education of the Roma is becoming critical for the country. In 2019, 68% of Roma left the education system prematurely (REPORT on the implementation of national strategies for Roma integration: combating negative attitudes towards Roma people in Europe). Estimates show that its number will reach between 363 thousand people and 393 thousand people in 2020 and will grow to 438 thousand people according to the pessimistic forecast, 556 thousand people according to the realistic forecast and 619 thousand people according to the optimistic forecast. in 2050

In the town of Dupnitsa there are separate Roma communities - Kavaklia district, Spartak district, Gizdova mahala district, Podina district and Arakchiyski most district. The separate Roma neighborhoods are areas with a large relative share of children, families and people at risk: the long-term unemployed with low levels of education and professional qualifications, underage mothers, large and single-parent families. These risk factors lead to different patterns of social exclusion among children. Social isolation in the neighborhoods hinders the socialization and education of children, blocks their development and dooms them to unemployment and poverty in the future.

The NSI does not offer demographic forecasts at the municipal level. For this purpose, they need to be purposefully developed within the scope of a new task. A certain reference point in their development are the presented trends in the perspective development of the population of Dupnitsa municipality, developed by the NSI.

The KOVID pandemic 19

On January 9, 2020 in China CDC (Chinese Center for Disease Control and Prevention) reported that a new coronavirus (later called SARS-CoV-2, the virus that causes COVID-19) was found to cause 15 of 59 cases of pneumonia [4].

The pandemic, which is spreading around the world, is officially called "severe acute coronavirus 2 syndrome", also known as SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2). The disease caused by SARS-CoV-2 is called COVID-19.

A common assessment by a number of international experts is that once again (after the economic crisis, the migrant crisis, Brexit), the EU and its Member States have proved unprepared for the disaster. Unprepared were also global institutions, such as the World Economic Forum (WEF), which in its annual report on risk assessment and forecasting of possible negative trends at the end of 2019 did not even include in the list of 10 possible dangers, health risk and the possibility of a pandemic - [26].

It turned out that despite numerous declarations, reports, conferences, etc., neither at national nor at European level is the mechanism for pre-playing various possible scenarios and the simulated impact of possible measures to prevent the negative impact of the pandemic being actively implemented.

Each country, based on its experience, knowledge and initiative, has taken certain measures to protect the population.

[4] News X. Experts claim that a new coronavirus is identified in Wuhan 2020 [14 January 2020]. Available from: http://www.xinhuanet.com/2020-01/09/c_1125438971.htm

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

The pandemic has caused three significant crises that will last for years:

1. Health crisis.

Months after the first registered cases of the disease, the confusion and divergent messages of the crisis headquarters for the implementation of anti- pandemic measures were seen as of February 1, 2022. There are objective reasons that could not lead to the adoption and approval of response thresholds.

The predictions were based on known statistical mathematical models for the expected number of patients based on testing. Due to the lack of a national and municipal integrated center for disaster risk reduction, including pandemic risks, research is carried out in fragments by various scientific organizations.

2. Economic crisis

coronavirus pandemic has spread to almost every country in the world. Governments are fighting new blocking measures to tackle the spread of the virus. Despite the development of new vaccines, the issue of recovery is one of the most important, especially when the end of the pandemic is not yet in sight. The economic crisis sparked by the outbreak of COVID-19 is hurting economies, regardless of income levels.

Approximately 81% of countries have experienced a decline in industrial production by an average of 6%. A comparison of data for April 2020 compared to December 2019 reveals that industrial production fell by an average of 20% in 93% of countries. One of the most affected industries is tourism and the automotive industry (down to 94%) [5]. The economic impact of COVID-19 on the industrial sector ultimately depends on how ongoing restrictive measures and related restrictions affect manufacturing enterprises. The degree of production capacity of companies, their degree of integration into local and global production networks and the type of market they serve are important factors determining the degree of impact of the crisis on companies.

3. Information

With the declared state of emergency and the dissemination of all information from official and unofficial sources, mainly from social networks, there was an oversaturation of information, including false information. The problem of fake news is deepening and gaining unimaginably great weight, which is manifesting itself and affecting the health and economic crisis. At the beginning of the fourth wave (July 2021), the vaccination information campaign was not effective with all the negative consequences.

3.2 Social care and social assistance

The forecast for the need for places in social institutions is also developed on a normative basis. The norms for the need for places are in accordance with the number of people who need social support and care .

[5] https://www.unido.org/stories/coronavirus-economic-impact-10-july-2020

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

For the purposes of the forecast in the field of social assistance and care, the following values of the norms for the need for places are proposed, referring to 10,000 e. Of the population:

- 2016 - condition - total number of places in social institutions - 19.3 places per 10,000 d, of which 7.8 places in specialized institutions and 11.5 places in residential type institutions;

- 2020 - 2050 - forecast norm for the whole forecast period - 25 places per 10,000 d., Of which 6.0 places in specialized institutions and 19 places in residential establishments .

After the start of the war in Ukraine (February 24, 2022) and the economic sanctions imposed on Russia by Europe and the United States, an energy crisis, high prices and fuel shortages, a refugee crisis and much more are expected. These measures cannot lead to a weakening of disaster preparedness, the introduction of preventive measures to reduce the likelihood and increase preparedness for fire response.

4. Identification of 10 vulnerable areas prone to fire within the town of Dupnitsa

Determining fire hazard classes (Table 2) for different forests and under Ordinance №6 and № 18 (Table 3) [6],[7]

Table 2 Determining fire hazard classes

Вид на горите	Овлажняване на месторастенето		
	Много сухи, сухи, сухи до свежи	*Свежи до сухи, свежи*	*Свежи до влажни, влажни иглолистни*
иглолистни	*I клас*	*II клас*	*III клас*
широколистни	*II клас*	*III клас*	*III клас*

Table 3 Determination of fire hazard classes under Ordinance №6 of 2004

Класове на пожарна опасност по Наредба №6 от 2004 г.	Класове на пожарна опасност по Наредба №18 от 2015 г.	Цвят
1. с много висока пожарна опасност – I клас	*1. с висока пожарна опасност – I клас*	*червен*
2. с висока пожарна опасност – II клас		
3. със средна пожарна опасност – III клас	*2. със средна пожарна опасност – II клас*	*жълт*
4. с ниска пожарна опасност – IV клас	*3. с ниска пожарна опасност – III клас*	*зелен*
5. с много ниска пожарна опасност – V клас		

According to the algorithms set in the Methodology for assessment and mapping of the risk of forest fires on the territory of the country [8], for each administrative district in Bulgaria are determined

[6] Ordinance №6 on the organization of forests and lands from the forest fund and of the hunting economic regions in the Republic of Bulgaria. MAF. SG no. 27 / 05.02.2004

[7] Ordinance № 18 on inventory and planning in forest areas. MAF. State Gazette No. 82 / 07.10.2015

[8] Lyubenov, K. Assessment and mapping of the risk of forest fires on the territory of the country. MAF. For the needs of the Rural Development Program (2014–2020) - Measure 8. "Investments in forest territories, development and improvement of forest viability", adopted by EAG-MAF, November 2016

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..

This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.

general and silvicultural characteristics, fire activity and the risk of forest fires. The distribution of the degree of risk of forest fires is shown in (Fig. 6).

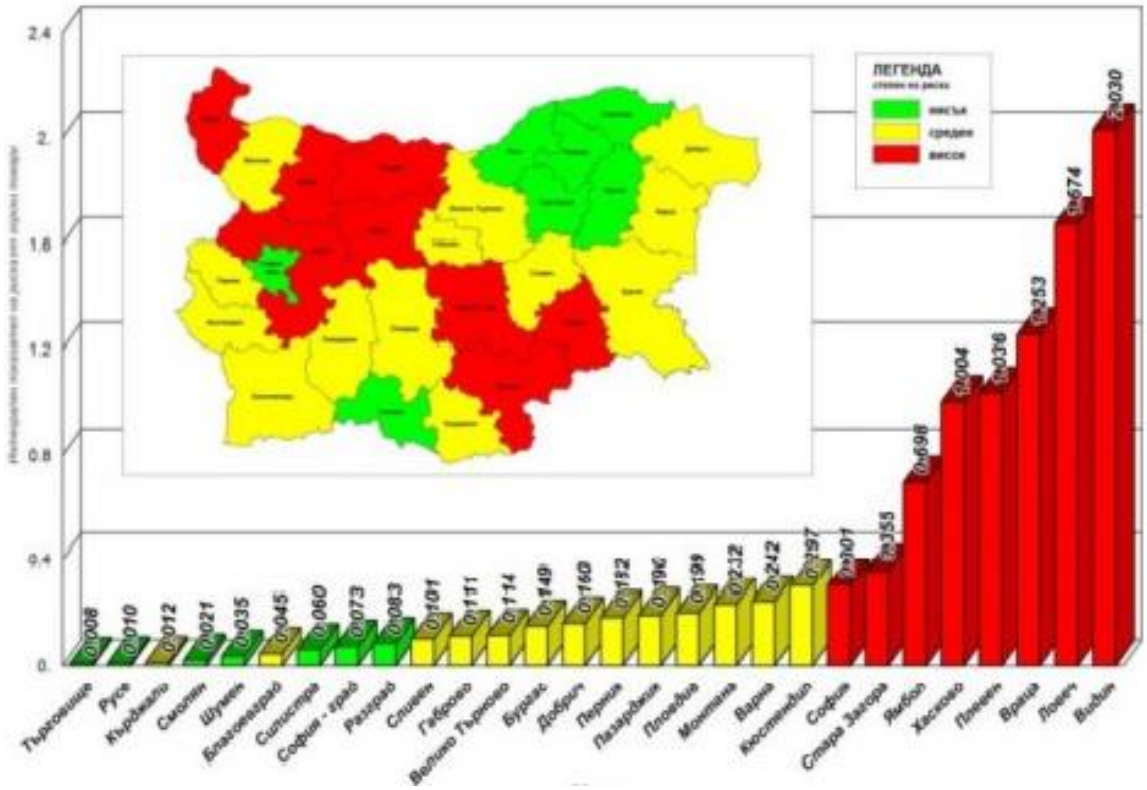


FIG . 6. Rank arrangement on districts in Bulgaria on integral indicator on risk from forest fires

From FIG. 6 shows that the municipality of Dupnitsa falls into the yellow zone. For example, the summarized data for determining the risk of forest fires on the territory of Dupnitsa is shown in Table 4.

Table 4

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

№	Област	Плътност на пожарите, $R_{пл}$	Фактическа горимост на горската територия, $R_{ф.гор.}$	Интегрален показател на риска, $R_{риск}$	Площи от I кл. на п.о., %	Степен на риска	Ср.год. % на опожаряване на гор. територия
1	2	3	4	5	6	7	8
10	Дупница	0,18	1,65	0,297	29,1	среден	0,16

For the whole district of Kyustendil in the period 2006-2015 in the forest territories of the district were registered a total of 258 forest fires, or 4.69% of the total number for the country, which burned 2403.6 ha of forest areas - 2.71% of the total area burned for the country for the same period. The average annual rate of fire in the forest areas for the district is 0.16%. The average annual size of a fire is 9.32 ha , or 1.73 times lower than the national average. Maximum values of fire activity in the district are reported in 2007 and 2011, when the number of fires exceeded the average for the period by 2.58 and 1.69 times, respectively, and the burned area is greater than the average of 3.84 and 2, respectively. , 66 times.

For Dupnitsa, the assessment and mapping of the risk of forest fires and the density of forest fires according to the Methodology is estimated at an average of 0.18 fires per 1000 ha of forest territory. On average, 1.65 ha are burned annually on 1000 ha of forest territory . The determined average risk of forest fires for the municipality of Dupnitsa is plotted on the map with the administrative division of the country in yellow (Fig. 6)[9]

Table 5 shows the fires in the forestry and the number of accidents in the urban areas of the municipality of Dupnitsa

Table 5. Types of accidents for the period from 2017 to 2021 on the territory of Dupnitsa municipality

Вид произшествие	2017 г.	2018 г.	2019 г.	2020 г.	2021 г.	Общо:
Пожари в горско стопанство на територията на община Дупница	4 бр.	4 бр.	9 бр.	0 бр.	1 бр.	18 бр.
Брой произшествия в урбанизирани територии на община Дупница	138 бр.	103 бр.	152 бр.	124 бр.	169 бр.	686 бр.

[9] PERFORMANCE ASSESSMENT AND MAPPING AT RISK OF FOREST FIRE ON THE TERRITORY ON THE COUNTRY , Assoc. Prof. Dr. KIRIL LYUBENOV

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.

5. Analysis of the operational strengths and weaknesses of local institutions directly involved in the management and prevention of natural disasters with a focus on fires

Several problems have been considered, and a SWOT analysis has been made for each of them.

Level of adaptive capacity

Public readiness, existing measures to minimize the adverse effects of fires

Timeliness and response in case of danger

Existing response infrastructure

Internal coordination processes

Potential resources available for dealing with fires incl. Equipment, technological solutions, specialists, volunteers, etc.

Summary SWOT analysis looks at more global challenges facing the RSPF in the context of protecting citizens from fires and other disasters.

Assumptions

RD "Fire safety and protection of the population" - Kyustendil, is a structural unit in the system of the Ministry of Interior since January 1, 2011, when the new Ministry of Interior came into force.

He exercises his powers on the territory of Kyustendil region. Fire and emergency safety in the district is provided by four regional offices for PBZN - in the towns of Kyustendil, **Dupnitsa** , Bobov Dol and Rila. The geographical features of the district define it as fire-hazardous due to the presence of large forests with fire hazard class "A" and an empty agricultural fund next to them;

- Existence of a large number of sites performing fire and explosion hazardous activities / gas stations , gas stations, commercial sites, etc./;

- The presence of remote and depopulated settlements from the municipal centers;

- The passage through the region of two transport arteries of national importance - Sofia-Kulata and Sofia-Gueshevo;

- The crossing of gas pipelines to Greece and Macedonia, as well as the gasification of Kyustendil municipality and Dupnitsa municipality;

- Low degree of fire resistance of a large percentage of the housing stock, ancillary and some industrial buildings;

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

- The availability of buildings for mass gathering of people, high-rise buildings, as well as buildings in poor fire condition, social homes, schools, etc .;

- The presence of explosive warehouses, warehouses for pesticides and general hazardous substances.

If we turn to the history of RSPBZN Dupnitsa we will see that it has managed to provide consistent, relatively good and quality services to the municipality of Dupnitsa, which has developed beyond recognition in recent years.

As the city develops, the needs of the population change, so does the fire department.

The work shifts of RSPBZN Dupnitsa cover 24/7.

RSPBZN Dupnitsa and administrative offices are located in the western part of the city.

The fire service will continue to protect the lives and property of residents and visitors by using its resources and staff designed to provide emergency medical care, fire prevention, firefighting and other emergency and administrative services. This will include not only the efficient use of local resources, but also the expanded use of automatic help links with neighboring municipalities and other organizations and volunteers.

RSPBZN provide residents and guests of Dupnitsa municipality:

Excellent service;

Responsive, efficient, dedicated and committed workforce.

Continuous improvement, creative and strategic management;

Continuous improvement through targeted results focused on residents;

Transparent work;

Ethical, accessible and responsible operations;

A fair, respectful, responsible, compassionate and friendly team

5.1 Analysis of the operational strengths and weaknesses of the local institutions directly involved in the fire predisposition in the region of Dupnitsa

5.1.1 Level of adaptive capacity

Analysis of internal factors	**Analysis of external factors**
Strengths	Opportunities
Developed legal framework; Organized National, District and municipal structure; Voluntary formations; Training and coaching programs; Good work with municipal	Application of good practices; Training and coaching using interactive programs; Project financing; Work with insurers;

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

employees Interoperability with other city departments	
Weaknesses	Threats
Large number of normative acts; The responsibilities for interaction with other ministries, departments, municipalities are not legally regulated; information resources, data analysis	Loss of experience and knowledge (retirement); Construction and urbanization; Sustainable financial viability; Innovation; Uneven population density;

5.1.2 Public readiness, existing measures to minimize the adverse effects of fires

Analysis of internal factors	**Analysis of external factors**
Strengths	Opportunities
Public trust; Troubleshoot site inspection issues Raising awareness and reducing the risks of forest and urban fires. Employee support and incentive system Assistance to citizens and the municipality Citizen satisfaction Community needs assessment and gap analysis 5 Community support	Work with professional house managers, company managers; Concluding agreements with external organizations and companies to provide emergency assistance with food, water and materials; Attracting expertise from research institutes, universities, NGOs and professional associations with the capacity to propose applicable and effective innovations
Weaknesses	Threats
Effectiveness of the programs for work with the population; There are no long-term measures to prevent fires; Insufficient resources for preliminary analyzes, research and innovative solutions for working with the population.	Budget constraints; Public disinterest; Poor training and lack of habits for actions in case of fires by the population; Deterioration of public attitudes; Lack of public awareness; Poor communication with the media

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

5.1.3 Timeliness and response in case of danger

Analysis of internal factors	Analysis of external factors
Strengths	Opportunities
Good training of the team; Good coordination within RSPBZN; Good knowledge of the infrastructure of the area of operation; Good resource planning; Timely notification and response in case of fire	Improving the capacity to work with new technologies; Budget constraints when purchasing new equipment, facilities and systems; Safe routes; Work with volunteers; Improving education and training
Weaknesses	Threats
Outdated equipment Poor continuity and difficulty in finding operational staff; Lack and poor use of historical data on past fires; geospatial information, interactive maps and routes Interoperability with other services.	Loss of information; Failure of the communication system; Reduced staffing as a result of a pandemic; Fuel, water, consumables Delay, wrong address submitted by 112 or other services or individuals; Infrastructure, congestion, impassable sections; Inadequate resources

5.1.4 Existing response infrastructure

Analysis of internal factors	Analysis of external factors
Strengths	Opportunities
New standards for design of buildings, roads, etc .; Training ground Good knowledge of the area; New construction, materials	Providing external hydrants; GIS information materials; Categorization of sites endangered by fire; Identification of infrastructure criteria for prevention and response to fires in the area
Weaknesses	Threats
Fire infrastructure; Analysis used in analyzing the criteria for appropriate fire prevention infrastructure; Presence of fire towers;	Accessibility to any potential forest and city fire site; Characteristics of the buildings Related disasters - earthquake, fire, flood;

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

	Unknown environment, type of construction; Lack of building plans

5.1.5 Internal coordination processes

Analysis of internal factors	**Analysis of external factors**
Strengths	Opportunities
Good knowledge of the team; Developed Standard Operating Procedures Subordination in the fire department; Risk Management	Improving interaction with the ESS Coordination with neighboring municipalities; Information processing system to maintain incident safety, reporting, management, planning and decision making
Weaknesses	Threats
Coordination with the municipal plan for protection against disasters (fire) Records of the incident (fire) Accountability of all resources, technical and financial	Incident organization, defining the activities and responsibilities assigned to the incident commander and others. Coordination with other services

5 .1.6 Available potential resources for dealing with fires incl. equipment, technological solutions, specialists, volunteers, etc.

Analysis of internal factors	**Analysis of external factors**
Strengths	Opportunities
Good knowledge of the equipment; Work with volunteers; Incident Objectives and Priorities (Incident Action Plan); Communication plan;	Attracting additional forces and resources, Training of volunteers, Volunteer equipment; Partnership programs with other municipalities; Sharing resources when needed, New technological solutions, information technologies, GIS

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

	environment
Weaknesses	Threats
Fire communication guidelines should include communications necessary for the collection and analysis of information; Limited funding Communication equipment Fire towers	Radio traffic , Large-scale fire in an urban environment Fire in a hard-to-reach area; Training of volunteers

From the stakeholder survey, participants acknowledged that there are threats and challenges that are changing priorities such as a growing population of aging citizens in need of more services, a younger generation that puts technology first and practical work second. place, the aging of the material base, together with demographic / economic changes that affect the limited resources of the fire brigade and the municipality.

The following chart looks at the global strengths, weaknesses, opportunities, and threats identified during this study.

Analysis of internal factors	**Analysis of external factors**
Strengths	Opportunities
- Good planning organization for distribution of activities and responsibilities between the fire brigade and the institutions for risk reduction and for reaction in case of fire or other disasters or accidents; - Built a unified rescue system and established a coordination center 112 for all of Bulgaria; -Described and distributed the responsibilities and positions of the RSPBZN, the various institutions and the persons responsible in them, depending on the profile and scale of the fire, disaster or accident; - Engineering and organizational measures for disaster prevention are provided; - Good civil society organizations (CSOs - Red Cross, Mountain Rescue Service, Water	-Technical possibilities for joint mapping of fire risk areas, which would allow the development of complementary measures to prevent and mitigate any adverse effects; - The anthropogenic factor influencing the degree of fire risk can be investigated and measures to reduce the impact can be envisaged (mitigation of the effect of anthropogenic impact in order to reduce the risk of fire); -Financing through various operational programs, but for a single and synchronized effect on the territory of the municipality of Dupnitsa to reduce the risk of fire .; - Greater engagement with the private

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Rescue service, etc. with a focus on providing support. - A well-functioning Unified Disaster Protection Rescue System, which allows for the gradual deployment of forces and resources, depending on the development of the disaster.	sector and NGOs to understand their perceptions of risk and to ensure information on information activities as well as on further cooperation; - Better use of the capabilities of the European Information System for forest fires (EFFIS)
Weaknesses	Threats
-Lack of easily accessible graphic materials: - schemes, maps and territorial analyzes with detailed information of the risk areas. At the moment they are not found in the websites of the Ministry of Interior DGPBZN and RSPBZN Dupnitsa; -Lack of detailed risk analysis and protection in disasters such as: forest and field fires, industrial accidents; -Lack of sufficiently detailed zoning and cumulative reporting of the different types of risk for the territory of the municipality; - capacity and awareness at the local level are unstable. Quality of planning and readiness (including equipment, plans for evacuation, asylum or post-disaster assessment) is in many cases insufficient to ensure effective disaster response and recovery; -Insufficient density of fire towers in forest and field areas; -Lack of capacity for implementation and work with GIS systems and satellite earth observation systems.	-Risk of inability to organize / coordinate between the responsible institutions and local government; -Risk of reduced capacity of the units that deal with analysis and constantly monitoring of meteorological processes, which would increase the unpredictability of forest fires; - Untimely implementation of the established necessary engineering measures against fires; - Not to follow the fire-fighting construction strictly enough in the initial stage of the constructions; -Lack of active communication and publicity of the data from the analysis and monitoring of various risk factors for fires with the interested institutions and residents of the municipality. Do not take into account in sufficient detail the risk of urban and forest fires when planning measures to reduce the risk of fire and natural disaster; - Budget constraints when purchasing new equipment, facilities and systems -

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

5.2 Level of adaptive capacity

The Municipal Administration of the Municipality of Dupnitsa as of 15.02.2022 is presented in fig. 7

FIG. 7 Dupnitsa Municipal Administration. Source : https://iisda.government.bg

Staff - Total: 120; By official legal relationship: 16; By employment relationship: 104.

The area of operation of RSPBZN - Dupnitsa covers the territory of the municipalities of Dupnitsa, Sapareva Banya and Boboshevo.

There are regular trainings with the voluntary formations, training of the administrative employees for measures related to reducing the risk of fires and actions in case of fire.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

5.2.2. Public readiness

The readiness of citizens and volunteers in the municipality of Dupnitsa to deal with fires is determined primarily by their training, exercises and readiness. Unfortunately , it may still be desirable in this regard. Surveys, surveys and interviews with the population - students, employees, business owners, citizens with disabilities and others. show that more practical training and education is needed.

The Regional Fire Service of Dupnitsa (RSPBZN) together with DGPBZN and other organizations develop and deliver programs for fire prevention and safety education in partnership with other organizations for response to fires and emergencies. RSPBZN and Dupnitsa Municipality work to promote and improve fire prevention and safety through research, testing and evaluation.

Deaths from fires can be reduced by teaching people the basic facts about fire. Even through simple messages, talks, presentations and more. it can help to explain the characteristics of the fire to community members.

In today's business and administrative world, there is a growing emphasis on the use of computers and electrical equipment. As industries continue to insist on a major overhaul and update of their data systems, there is a greater risk of short-circuit fire. In addition, many companies maintain a huge amount of combustible and flammable materials in the workplace. It is important to conduct regular fire preparedness training.

Everyone should be aware of what to do in case of fire. There are two specific cases that need to be considered when discussing fire preparedness:

Fire readiness: During working hours

Fire readiness: Out of working hours

FIG. 7 illustrates that there is no practice in the community to develop family evacuation plans in case of fire. The study was conducted in two groups - people with disabilities and healthy.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

FIG. 7. Availability of a community evacuation plan. Own research on a project

An important condition for improving society's preparedness to respond to fires is optimizing, expanding and improving sources of information. Fig . 8 shows where the residents of Dupnitsa most often find information about fire safety.

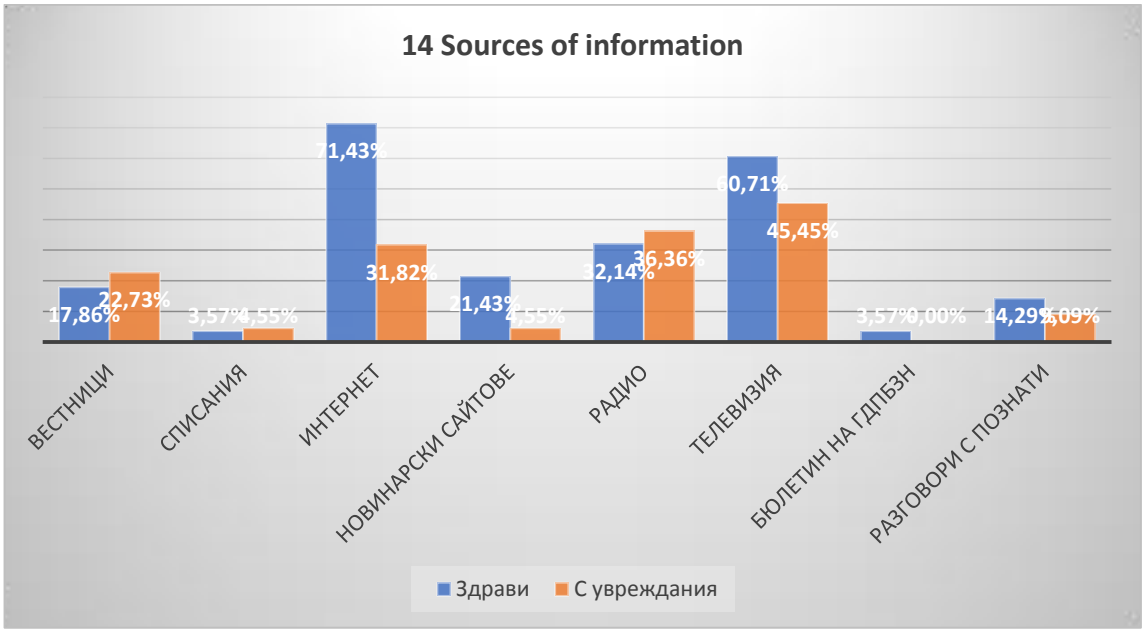


FIG. 8 Sources of information. Source Own research by project

6. Existing measures to minimize the adverse effects of fires

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

6.1 Waste

Despite the relatively well-organized garbage collection system, there are unregulated landfills in the municipality. Some of the unregulated landfills have been removed and closed. Most have stored household and construction waste. The danger with them is that a fire can break out at any moment.

The problem is the unregulated storage, transportation and loss of radioactive materials. Landfills are especially dangerous, where such materials can get into the atmosphere and spread in case of fire. The Nuclear Regulatory Agency is an independent specialized body that implements state regulation in the field of safe management of RAW and SNF and maintains the legislative framework and regulatory system in this area.

6.2 Timeliness of response in case of danger

Most often, people at risk call the Single European Emergency Call Number (ENPI) 112. After receiving information, for example about a fire, fire, SMP and police teams are sent to the scene.

Unfortunately, almost 100% of private homes in Dupnitsa do not have fire alarm systems, smoke alarms and other means that can warn in time of a fire.

Fire Response Time - Provides valuable information for resource allocation decisions, such as the location of the fire station, the equipment deployed, and the number / staff levels of the team.

For example, if a fire brigade is engaged for a long time to put out a fire in a neighborhood, a significant percentage of the total resources may be involved and there is a risk of leaving other neighborhoods uncovered at greater risk because the resources are scattered outside their area for immediate response, causing longer response times over longer distances. This large volume of incidents and frequency of incidence overlaps requires additional resources to ensure an effective response to emergencies.

There are three main components to the performance of a fire emergency response service:

Availability — The extent to which resources are ready and available for response.

Capability — The ability to deploy incident management resources.

Operational efficiency - Product of availability and capability. This is the result achieved by the deployed resources or the ability to match the resources.

There are international and national standards and Standard Operating Procedures that define assessment and response times: Standard for the organization and deployment of firefighting operations, emergency medical operations, and special public operations by fire services. These criteria include, but are not limited to:

Alarm response time: 15 seconds for 95% of calls; 40 seconds for 99% of calls;

Alarm processing time: 64 seconds for 90% of calls; 106 seconds for 95% of calls;

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Activity time: 60 seconds for EMS responses; 80 seconds for fire reactions;

First car arrived Arrive on the spot: 240 sec (4 minutes) for 90% of the answers with a minimum staff of 4 people;

Second team - Arrive at the scene of the fire in time: 360 seconds (6 minutes) for 90% of the answers with a minimum staff of 4 people.

It is generally considered that the total response time, which is the time required from the call received, to the arrival of the first team at the scene.

Call processing time - the elapsed time from the incoming call to the sending of the first team.

Response time - the elapsed time from the moment of sending the team to the beginning of the team's actions.

Travel time - the elapsed time from the time the team receives the message to its arrival at the place.

6.3 Existing response infrastructure

Urban fires can be affected by urbanization. Residents of the center of Dupnitsa, for example, live in densely populated areas. The condition of the building, the interior furniture, the storage areas, etc. of the house, can determine the risk of fire.

Practice shows that the lack of good infrastructure for disaster prevention and fire prevention and difficult access to the property is the main reason for the ability to respond to fire accidents.

Critical infrastructure includes those physical resources, services, information technology and infrastructure assets whose damage or destruction would have a significant impact on the health, safety, security or economic well-being of citizens or on the effective functioning of government. (Green Paper on a European Program for Critical Infrastructure Protection).

The critical infrastructure of the Municipality of Dupnitsa can be classified into 9 classes of sites:

1. Drinking water treatment plants;
2. Wastewater treatment plants;
3. Military sites;
4. Fire safety and protection of the population;
5. District Police Offices;
6. TPP and HPP;
7. Schools;
8. Transport and engineering infrastructure;

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

9. Medical establishments

All objects must be accompanied by a complete database - attribute information: Name, Address, Status and Contacts

Buildings are most vulnerable during the construction phase due to the presence of combustible materials, sources of ignition, lack of fire protection systems or barriers, and potential security problems for the building and location.

Research shows that wooden buildings are as safe as steel structures or reinforced concrete buildings once fire safety systems are in place, but also, all buildings are more vulnerable to fires without these systems.

Pre-developed action plans in the event of an accident (before the fire) are a critical tool in the fire safety of the construction site. Developed in partnership by the site representative and the fire department, the plans summarize critical information that will be needed to respond effectively to a fire. Emphasis should be placed on informing the fire service about changes during construction that could affect the ability of fire brigades to prevent and extinguish fires, as well as changes in access to water supply.

The construction phase is the most dangerous moment in the life of any building due to a number of risks, including:

Proximity of flammable materials to sources of ignition (eg electrical equipment and construction activities such as welding;

Lack of completion of built-in fire protection systems such as sprinklers;

Lack of doors, finished walls and other barriers that can slow the spread of fire; and

Potential security issues at the construction site.

Typical hazards on construction sites include:

Temporary heating equipment;

Smoking;

Waste disposal;

Open fire;

Spontaneous ignition;

Cutting and welding;

Electrical faults;

Flammable liquids;

Flammable gases; and

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Explosives.

The main causes of fires in buildings under construction or demolition are:

Arson or suspicious events;

Open flame and embers; and

Heating equipment

6.4 Internal coordination processes

Fire departments usually provide both prevention and extinguishing services for local fires in forest or urban areas and homes. Although greater emphasis should be placed on prevention, RSPBZN should also be prepared for extinguishing in the event of a fire.

Typical activities and factors influencing the role of the local fire service are described in Table 6.

Table 6

	TYPICAL ACTIVITIES	FACTORS
Prevention	Contact with site representatives and construction inspector (current) Review / approve a plan before an accident Inspections and law enforcement Monitoring of changes in the site, especially on access and water supply	Department resources Understanding the risks Normative knowledge
Extinguishing	Site-specific fire planning firefighting scenarios / tactics Typically protective approach	Safety of life and risks of exposure Department resources Height of the structure / access to the site

7. Available and potential resources for dealing with fires, incl. equipment, technological solutions, specialists, volunteers , etc.

The "Forest Management Plan for Forest Territories" adopted in 2020 in the part "Fire protection device" provides:

1. Barrier barriers - natural fire barriers meeting certain requirements.

2. Forestry barriers - clearings cleared of vegetation and plant waste of a certain width. The plan provides for the maintenance of existing ones.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

3. Mineralized strips - strips where the plant cover is removed to a mineral layer. Annual maintenance and construction of new mineralized strips is planned.

4. Sanitary strips.

5. Roads for fire trucks - roads with certain requirements.

6. Stationary observation posts.

7. Signs and billboards with fire-fighting content.

8. Places for lighting fires - the construction of new places for lighting fires is planned.

9. Fire-fighting depots-equipped according to the ordinance for protection of the forest territories from fires.

10. Helicopter landings for the needs of protection and defense of forest territories - are not provided.

11. Patrol routes - daily patrols on routes near the forests with first and second class of fire danger are not provided.

12. Barriers on forest roads at high risk of fires - not provided.

The annual planned "Operational Plan for Protection of Forest Territories from Fires" and "Action Plan for Extinguishing Forest Fires" set out the described planned measures. The plans are being agreed with PBZN.

The work on the overall prevention of forest fires needs to be organized at every level, from municipal employee to mayor. The exchange of information between the various units is essential for a proper and rapid response in the fight against forest fires.

During the fire season it is desirable to carry out daily patrols on routes near forests with high fire danger.

When announcing forest fires, it is necessary to include the OP "Management of municipal lands and forests", and each employee must have protective equipment. To carry out the initial reaction in case of forest fires, equipped off-road vehicles are required for each forestry section. They will also be used to transport people and equipment if needed.

Voluntary formations for firefighting in forest areas should be formed in accordance with the "Ordinance on the protection of forest areas from fires" and equipped with the necessary protective equipment.

Necessary actions :

- Картиране на местности и услуги;

- Включване на гражданите като наблюдатели;

- Изграждане на системи за регистрация на първи признаци на пожари;

- Разработени подробни планове за действие при пожари в гори в резервати и защитени територии;

- Планиране използването на техниката и на доброволците в труднодостъпни местности;

- Разработване на модели за разпространението на пожари.

- Изграждане на нови и поддържане на съществуващите противопожарни

8. Examples of urban and forest fires in the municipality of Dupnitsa

Пожари в Дупница -факти

На човешката небрежност се дължат 96% от горските пожари.

Само 4% от горските пожари възникват от природата, всичко останало е плод на човешката небрежност и в много малък процент

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

2019 Г. Е БИЛА НАЙ-ТОПЛАТА ОТКАКТО СЕ ПРАВЯТ ИЗМЕРВАНИЯ В ЕВРОПА.

СРЕДНАТА ГОДИШНА ТЕМПЕРАТУРА ПРЕЗ 2019 Г. НАДВИШАВА СТОЙНОСТИТЕ НА 2014 Г., 2015 Г. И 2018 Г., КОИТО СЪЩО БЯХА МНОГО ТОПЛИ ГОДИНИ ЗАРАДИ УВЕЛИЧЕНИЕТО НА ПАРНИКОВИТЕ ГАЗОВЕ В АТМОСФЕРАТА.

Table 7. Occurred fires on the territory of Dupnitsa municipality for the period 2017 - 2021

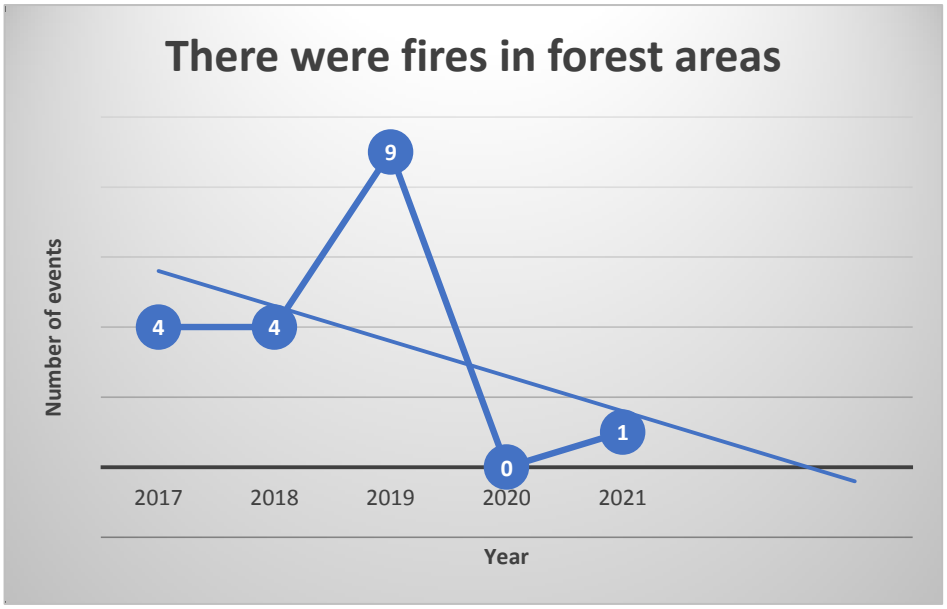
Type of fire	017	018	019	020	021	Total:
Fires in forestry on the territory of Dupnitsa municipality *	pcs.	pcs.	pcs.	pcs.	piece.	18 pcs.
Number of accidents in urbanized areas of Dupnitsa municipality **	38 pcs.	03 pcs.	52 pcs.	24 pcs.	69 pcs.	686 pcs.

Source: GDPBZN

* One of the most fire-hazardous years in terms of fires in forestry in the municipality of Dupnitsa is 2019 (Table 7)

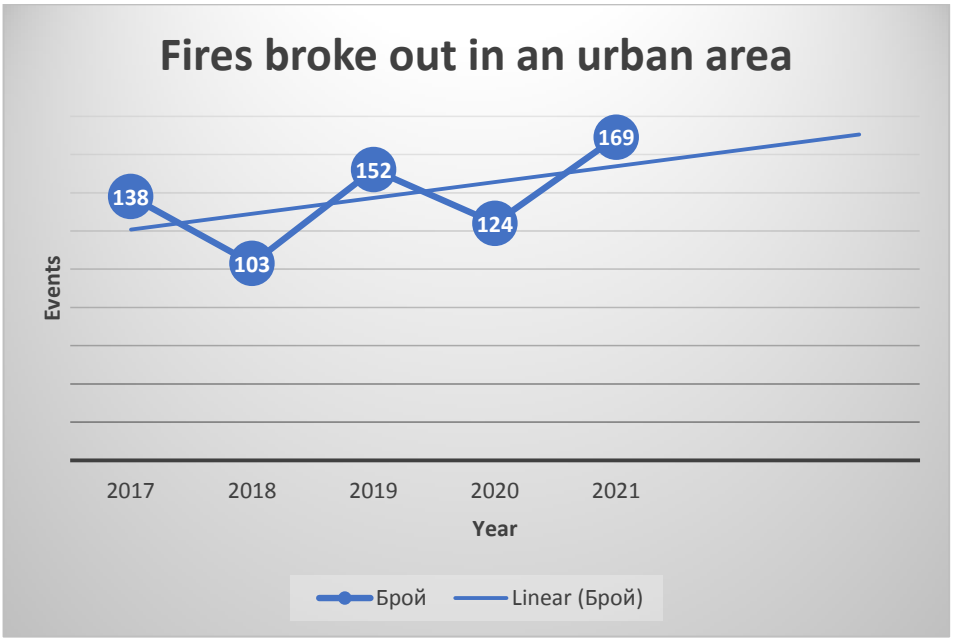
The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

In general, however, for the last 5 years (2017 - 2021) there is a tendency to reduce the number of forest fires in the municipality of Dupnitsa. This may be due to the measures taken to monitor the risk of fire and the measures taken to prevent the occurrence and spread of fire in forests and fields.



** This is not the case with the fires in the urban areas in the municipality of Dupnitsa. There is a tendency to increase the number of fires over the years, as for the last 5 years the increase is 22.5%.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.



8.1 General effects of fires on nature and the human body.

The causes of fires are various - negligence in handling fire, unmaintained environment, short circuit, improper and criminal storage of combustible waste materials and more.

Fire - only one who has survived the horrors of the fire, can tell the whole hopelessness of the disaster - burns, suffocating gases, complete disorientation.

Emissions from wildfires contribute to air pollution by increasing atmospheric levels of pollutants that are harmful to human health and ecosystems and impair visibility, leading to dangerous or generally unpleasant conditions.

The wide variety of pollutants emitted by wildfires includes greenhouse gases (carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O)), photochemically reactive compounds (eg carbon monoxide (CO), nitrogen oxides) ((NOx)), fine and coarse dust particles. Natural fires affect the climate both directly, through greenhouse gas and aerosol emissions, and indirectly, through secondary effects on atmospheric chemistry (eg ozone formation (O_3)) and microphysical properties and aerosol formation processes.

When a fire breaks out, open combustion poses risks both to the environment and directly to the health of the population, animals and agricultural products. Smoke pollutes the air we breathe. The ash pollutes our soil, groundwater, lakes, rivers and streams. Burning everything outdoors can cause a forest fire.

While in the case of forest and field fires the products of combustion and the composition of the gases can be described well enough, in the case of a city fire there are many more unknowns.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

In just one residential or industrial building we have hundreds of types of materials - known and unknown. As a combustible material can be the insulation of the building, wooden beams, paint on the walls and wooden parts, fabrics, plastics, gasoline, kerosene, alcohol and many others. Various chemical products are often stored that are not labeled, and even firefighters are not aware that they have been stored - paints, solvents, resins - polyurethane and epoxy, pesticides, poisons, tires - the list is endless.

The indirect danger of burns should also not be overlooked - the rest of the burns contaminate the soil and groundwater and can enter the human food chain through crops and livestock. In addition, some chemicals released by combustion can accumulate in animal fats and then in humans as we consume meat, fish and dairy products.

Smoke and soot have been shown to travel long distances. The devastating forest fires from California brought dust particles over Europe in just a few days, incl. and Bulgaria. Exhaust gases can also corrode metal cladding and damage paint on buildings.

8.1.1 Effects of burning plastic

Some of the most dangerous chemicals created and released during combustion are those from burning plastics such as dioxins, which are by-products of the combustion of chlorine-containing products. Dioxins adhere to the waxy surface of the leaves and can enter the food chain this way. Even if some types of plastic (such as polyethylene or polypropylene) do not contain chlorine, other materials attached to or burned with plastic can be a source of chlorine.

After a fire, large quantities of unburned plastic were found and as waste it penetrated the soil , rivers and lakes. From there, along the natural chain, they fall into the fish and from there to the man or the molten plastics themselves to turn into mosquito nests.

8.1.2 Effects of smoke from burning clean wood and leaves

When household waste such as wood and leaves is burned, it produces smoke that contains vapors and particles (solid and liquid droplets that spread in the air). Air pollution from smoke can affect human health. People exposed to these air pollutants may experience eye and nose irritation, difficulty breathing, coughing and headaches. People with heart disease, asthma, emphysema or other respiratory diseases are particularly sensitive to air pollutants. Other health problems aggravated by burns include lung infections, pneumonia, bronchitis and allergies.

8.1.3 Effects of smoke from burning rubbish and plastics

Burning garbage can cause long-term health problems. Toxic chemicals released during combustion include nitrogen oxides, sulfur dioxide, volatile organic chemicals (VOCs) and polycyclic organic substances. Burning plastic and treated wood also releases heavy metals and toxic chemicals such as dioxin.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Other chemicals released by burning plastic include benzo (a) pyrene and polyaromatic hydrocarbons, both of which have been shown to cause cancer.

8.2 Typical fires

Below are some of the most typical fires in the municipality of Dupnitsa.

8 .2.1 Fire at the railway station on Boboshevo

GPS: 42.158607,23.03755

Boboshevo Station, August 11 , 2021

Source: https://dariknews.bg/regioni/kiustendil/pozhar-zastrashi-zhp-garata-na-boboshevo-2280103

Reason : **Not careful outdoor handling _ fire in the area on village Slatino .**

Developed is on _ area of 300 decares , destroyed are 2000 m optical cable , 20 railway sleepers , contact network 500 m.

Possible combustion products : ash, nitrogen oxides, Carbon and carbon dioxide, sulfur dioxide, volatile organic chemicals,

8.2.2 Fire in dry grass Boboshevo

GPS: 42.158607,23.03755

The vicinity of Boboshevo station, August 11, 2021

Source: https://dariknews.bg/regioni/kiustendil/pozhar-zastrashi-zhp-garata-na-boboshevo-2280103

Cause: Unsupported power grid is the cause of forest fires

It will no are allowed taste 2021

Possible combustion products : Fine and coarse dust particles ($PM_{2.5}$), CO_2, aliphatic hydrocarbons

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

8.2.3 And swelling on gas bottle in an apartment in Dupnitsa

ж.к. _ " Bistritsa " bl.6, ent.6

GPS 42.252274, 23.131864

February 2 , 2022 12:24 , Dupnitsa

Source: **https://dariknews.bg/regioni/kiustendil/zhena-postrada-pri-izbuhvane-na-gazova-butilka-v-apartament-v-dupnica-2299142**

Cause: Technical failure of the gas cylinder

A woman was injured when a gas cylinder exploded in an apartment in Dupnitsa . The victim was assisted by a team from the Emergency Center in the city. The woman is the owner of the apartment where the accident took place. The fire in a house destroyed furniture.

Possible combustion products: Choking gases: CO, HCN, CO2, low oxygen content

- Irritant: acid gases - HCl , HBr , HF, COF2, H3 PO4, SO2, NOx organic irritants - acrolein , formaldehyde , crotonaldehyde , phenol, styrene , polycyclic aromatic hydrocarbons

8.2.4 Forest fire in the land of the village of Gramade

24/08/2010

GPS 42.216607, 23.039272

The territory of the State Forestry "Dupnitsa" in the land of the village of Gramade.

Source: https://www.dnes.bg/

Cause: Due to careless handling of open flames

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

It covered a coniferous forest. After receiving the signal for the fire, the management of SFE "Dupnitsa" reacted immediately, but due to the hot and dry weather the fire spread quickly.

Firefighters from Dupnitsa and two firefighters are also involved in the firefighting. The mayors of Dupnitsa and the village of Gramade are also helping to organize and send firefighting groups from the local population. In addition, the two specialized fire-fighting vehicles of RDG-Kyustendil are included. As a result of the joint actions the fire was localized and extinguished.

Possible combustion products: greenhouse gases (CO2, CH4), NMVOC, NOx and aerosols, particulate matter.

8.2.5 Fire under a bridge in a landfill for secondary waste.

GPS 42.197434, 23.053136

August 13, 2019

Under the bridge of the Struma highway at the exit of Dupnitsa in the land of the village of Gramade at the junction for the villages of Blazhievo and Gramade. warehouse of the enterprise "Phoenix-resource.

Source: https://www.vesti.bg/bulgaria/chastichno-bedstveno-polozhenie-vdupnica-zaradipozharite-6098598

Cause: Flammable materials accumulated under the columns of the bridge at the exit of Dupnitsa were set on fire. They are clad **were flammable materials - paper and plastic for secondary primary materials under the bridge.**

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Teams of firefighters from Blagoevgrad, Dupnitsa and Samokov put out the fire during the night.

The mayor of Dupnitsa municipality has imposed a partial state of emergency. He issued an order to carry out non-immediate emergency recovery activities. The mayors of the nearby settlements will be involved in managing the situation.

According to the owner of the landfill for secondary raw materials, the cause of the fire was a burning object from the Struma Motorway.

Suffocating smoke and strong odors are felt not only in the area of the highway and in Dupnitsa, but also in Blagoevgrad, which is located 40 kilometers away.

Possible combustion products : solid residue, liquid fraction and gas fraction. H_2, H_2S, CO, CO_2, CH_4, C_2H_4, C_3H_6 and other light hydrocarbons, SO_2, NOx , CO and polycyclic aromatic hydrocarbons (PAHs).

8.2.6 Roadside fire

42.19608484835262, 23 . 05389417185408

August 29, 2015

Road to the village of Frolosh

Source: https://www.dunavmost.com/novini/pozhar-unishtozhi-300-dekara-gori-i-suhi-trevi-krai-selo-frolosh , BGNES

Cause: The fire was in the area of Leshtanska neighborhood , Frolosh village, Kocherinovo municipality. According to people, the fire was caused by a thrown butt on the road.

About 300 decares of forest and dry grass burned in a fire near the village of Frolosh.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

The fire started at noon after cleaning stubble in the Leshtanska neighborhood , Frolosh village, Kocherinovo municipality. A house burned down. No one was injured, as the neighborhood is sparsely populated. At 6.40 pm the fire was localized.

The fire was extinguished by three teams of firefighters from Rila and Dupnitsa with off -road vehicles, employees of the Forestry - Rila and a dozen volunteers.

According to unofficial information, 250 decares of forest have been burned, including white, black pine, hornbeam and 50 decares of grass. The problem turned out to be the wind, which periodically intensifies and re-ignites the fire.

Possible combustion products : greenhouse gases (CO2, CH4), NMVOC, NOx and aerosols, particulate matter.

8.2.7 Fire at the old Dupnitsa landfill

area Left in the direction close village Bistrica

GPS 42.235327, 23.126240

July 23, 2021

Source:
https://nova.bg/news/view/2021/07/23/334553/%D0%B3%D0%BE%D1%80%D1%8F-%_D1%_81%D0%_BC%_D0%_B5%_D1%_82%_D0%_B8%_D1%_89%_D0%_B5-%_D0%_BA%_D1%_80%_D0%_B0%D0%_B9-%_D0%_B4%_D1%_83%_D0%_BF%_D0%_BD%_D0%_B8%_D1%_86%_D0%_B0-%_D1%_81%D0%_BD%_D0%_B8%_D0%_BC%_D0%_BA%_D0%_B8 /

Cause: High temperatures. Self-ignited old landfill in the area of Dupnitsa or negligence.

It is assumed that during the decay of household waste methane was formed, which ignited.

The signal for the fire was submitted by citizens in RIEW-Sofia.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Source: MoEW

There is smoke in the area of the Struma Motorway. The smoke above the dump can be seen for miles.

Extinguishing method: Soil spillage in order to get to the total liquidation of the hearth faster

Possible combustion products: nitrogen oxides, sulfur dioxide, volatile organic chemicals (VOCs) and polycyclic organic substances, dust particles of different sizes.

8.2.8 Fire in the center of Dupnitsa

GPS 42.264381, 23.115276

January 5, 2022

Source: https://4vlast-bg.com/archives/465658

Reason: Short circuit in Christmas decorations!

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Improper use of heating appliances has caused a fire in a house in Dupnitsa. Destroyed 100 square meters of roof structure, furniture, furniture, windows. The fire was extinguished by 2 fire brigades of RSPBZN - Dupnitsa, no one was injured. 2 buildings and 50 square meters of roof structure were saved.

Possible combustion products: HCl , HBr , HF, COF2, H3 PO4, SO2, NOx organic irritants - acrolein , formaldehyde , crotonaldehyde , phenol, styrene , polycyclic aromatic hydrocarbons

8.2.9 Fire in the vegetable market in Dupnitsa

GPS 42.264562, 23.11651 2

01/21/2022

Cause: The reasons are being clarified

Source: https://www.dnevnik.bg/blogosfera/article/442477

Around 11 pm a fire broke out in stalls at the vegetable market in Dupnitsa. 15 square meters of roof structure were burned. The fire brigade prevented the fire from affecting neighboring sites, 50 square meters of roof structure were saved.

Possible combustion products: carbon monoxide (CO) - poisonous gas, soot - unburned carbon, which leaves as dirty particles, suffocating smoke

8.2.10 Fire in a house in the village of Florosh

October 11, 2016,

neighborhood Velovska

GPS 42.129321979207965, 22.910420658639087

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Source: https://www.novinite.bg/articles/124550/V-srutenata-sled-pojar-kashta-vs-Frolosh-zagina-61-godishen-maj

Reason: Most likely he fell asleep with a cigarette, first the blankets were lit, and then the whole house.

A 61-year-old man died after a fire that broke out at 5 am in the village of Frolosh, Kocherinovo municipality,

The signal for the fire in the Velovska neighborhood was given only at 8 o'clock. Three teams of firefighters from the town of Rila started putting out the fire. The 120-square-meter house, which is made of joists, burned down and collapsed. The man was in a room on the ground floor, his parents - the 83-year-old father and his mother - 82, who slept on the second floor, woke up from the fire at 6 o'clock and managed to get out.

Possible combustion products: HCl , HBr , HF, COF2, H3 PO4, SO2, NOx organic irritants - acrolein , formaldehyde , crotonaldehyde , phenol, styrene , polycyclic aromatic hydrocarbons

8.2.11 House fire

2020-12-14

Source: https://novini247.com/novini/23-godishen-maj-i-2-godishnoto-mu-dete-postradaha-pri-pojar-v_2960840.html

Reason: Ignition of a solid fuel stove with gasoline

Source: Pixabay

A 23-year-old owner was injured in a house fire in Dupnitsa. He tried to light a solid fuel stove with gasoline, and his 2-year-old child was also affected by the blaze. The owner of the house put out the fire himself, he has 22 percent burns, the child - 7 percent burns. They are accommodated

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

in a metropolitan health facility for treatment. Pre-trial proceedings have been initiated in the Dupnitsa District Court.

Possible combustion products: : HCl , HBr , HF, COF2, H3 PO4, SO2, NOx organic irritants - acrolein , formaldehyde , crotonaldehyde , phenol, styrene , polycyclic aromatic hydrocarbons,

8.2.12 An explosion of a gas cylinder caused a fire in a house in Dupnitsa

2020-02-01

The incident took place on Macedonia Street in the city.

GPS 42.26489555184724 , 23.111917542115528

Source: https://novini247.com/novini/vzriv-na-gazova-butilka-predizvika-pojar-v-kashta-v-dupnitsa_2335657.html , dnesplus.bg

Cause: Explosion of a gas cylinder

A man was injured, a woman and a child were taken to a medical institution for examination, the Bulgarian Telegraph Agency reported.

The explosion took place on the first floor of a house and shattered the windows. The explosion and the ensuing fire caused extensive damage to the first floor of the house, and damage to the second floor of the house. The reasons for the explosion of the gas cylinder should be clarified, but the most likely are technical irregularities or improper use. / BTA

Possible combustion products: : HCl , HBr , HF, COF2, H3 PO4, SO2, NOx organic irritants - acrolein , formaldehyde , crotonaldehyde , phenol, styrene , polycyclic aromatic hydrocarbons,

8.2.13 Fire in an apartment in Dupnitsa

2019-12-06

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Source: https://novini247.com/novini/71-godishna-jena-e-zaginala-pri-pojar-v-apartament-v-dupnitsa_2219613.html , bulnews.bg

Reason:

A 71-year-old woman died in a fire in an apartment in Dupnitsa.

The signal for the fire was received at 5.50 o'clock. Teams of PBZN Regional Work were sent on the spot. The body of the deceased woman was found in one of the rooms of the apartment. The fire burned the furniture in the room.

Possible combustion products : HCl , HBr , HF, COF2, H3 PO4, SO2, NOx organic irritants - acrolein , formaldehyde , crotonaldehyde , phenol, styrene , polycyclic aromatic hydrocarbons, carbon monoxide (colorless, odorless and extremely toxic), aldehydes, carbohydrates , carbohydrates soot)

Carbon dioxide and water vapor - both are present in larger quantities and although relatively harmless can make the indoor environment uncomfortable or contribute to moisture problems in the home

8.2.14 Fire on moped and trailer

October 21, 2021

Source: https://www.iskra.bg/motoped-i-remarke-sa-izgoreli-pri-pozhar-v-dupnitsa/

Reason:

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

A moped and a trailer burned in a fire in a garage in Dupnitsa.

The accident happened around 21:00 last night. The fire was extinguished by a team of RSPBZN-Dupnitsa, which saved 2 buildings from fire.

The reasons for the fire are clarified by RU-Dupnitsa. Pre-trial proceedings have been initiated.

Possible combustion products: HCl , HBr , HF, COF2, H3 PO4, SO2, NOx organic irritants - acrolein , formaldehyde , crotonaldehyde , phenol, styrene , polycyclic aromatic hydrocarbons, soot

8.2.15 Fire in the barracks

12/30/2013

Dupnitsa, Progona Street. GPS 42.246801, 23.098602

Source **:** https://infomreja.bg/

Cause: Cause of fire: Illegal connection to the electricity grid.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

The fire broke out in the shed. Firewood and equipment were destroyed, 2 cars were parked - "Volkswagen" and "Renault". In a neighboring shed, wood and 2 tons of wheat were burned. The flames were extinguished by RS PBZN Dupnitsa.

Possible combustion products : HCl , HBr , HF, COF2, H3 PO4, SO2, NOx organic irritants - acrolein , formaldehyde , crotonaldehyde , phenol, styrene , polycyclic aromatic hydrocarbons, soot

8.3 Conclusions on the provision of information.

Although DGPBZN and in particular RSPBN Dupnitsa declare that electronic information materials for the population are provided in the information site of the directorate, the site of even DGPBZN lacks structured information about fires in urban and forest areas in the municipality of Dupnitsa, where they are listed. fires by date, their exact location and map of the area of fire, the reasons for their occurrence, affected life, destroyed assets, response time from the signal, time for complete extinguishing of the fire, resources involved in manpower and volunteers and equipment , analysis of the possible avoidance of such fires and measures taken and implemented to prevent such fires.

Such information does not constitute a state secret within the meaning of the CIPA, nor does it constitute an official secret. Moreover, such information is public information that is useful for the population to increase their fire culture, to properly assess the possible sources of fire, the consequences of a fire due to ignorance, negligence, etc., and the actions of fire services , which would increase public confidence in institutions.

Due to the lack of online information on the websites of all units of the PBZN, the way to obtain it is difficult, cumbersome, slow and inefficient. A written reference submitted to the PBZN Regional Office is required. From there, the RDPBZN was directed, then to the DGPBZN and vice versa, the decision reached the applicant.

Based on world experience, such information is not only mandatory, but it is necessary to prepare interactive maps of fire hazards in the city, a map of forest fire forecasts, especially in the hot months of the year, indicating emergency roads in forest areas in case of fire and many others.

Such information is sought by chance, from various information sites, newspaper publications, eyewitness accounts, which is not serious in the 21st century.

Little attention is paid to the smoke caused by large forest fires.

Indeed, the RIEW makes measurements on some indicators of flue gases. But that's not all. There are no data on the type of fuel and the possibility of containing radioactive isotopes. The smoke spreads over great distances. On October 21, 2020, huge fires in California brought huge amounts of smoke to Europe through winds in the upper atmosphere. The models showed how this transfer takes place.

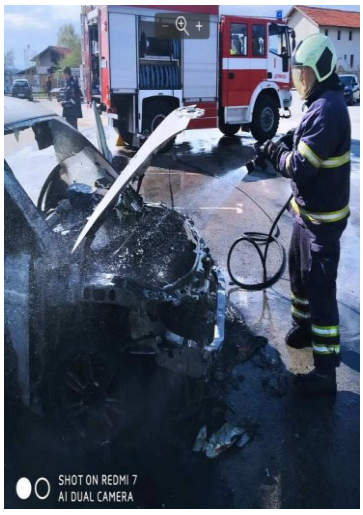
https://acd-ext.gsfc.nasa.gov/People/Seftor/world_2020_10_21-26.gif

On October 25, 2020, i.e. 5 days after the fires, traces of smoke were registered in Europe and Bulgaria and in West Africa.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Other photos of fires in DUPNITSA

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.



9. Main structural weaknesses / deficits, as well as strengths of the general. Dupnitsa in terms of management and prevention of natural disasters with a focus on fires

On the territory of the Municipality of Dupnitsa operate enterprises classified and registered as "enterprises with high risk potential" and "enterprises with low risk potential", in accordance with the requirements of the Environmental Protection Act and the Ordinance on the prevention of major accidents with hazardous substances and to limit the consequences of them. These are mainly enterprises from the chemical industry, production and trade in explosives, enterprises for oil refining and trade in petroleum products and gas. Major industrial accidents often have severe consequences for the population and the environment, and the impact can affect areas outside national borders. This emphasizes the need to improve existing controls on the dangers of major industrial

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

accidents involving dangerous substances and to take appropriate preventive action to ensure a high level of protection for the population and the environment;

9.1 Vulnerability profile

• Uncertainty in the household: Due to the proximity to rivers and other water sources, these areas have high fertility, as well as access to water for agriculture. In the event of a sudden flood or other disaster, families are highly vulnerable as food supplies are destroyed.

• Many houses are located in floodplains or on the slopes of hills, and they are threatened by both floods and landslides . There are almost no houses and farms with life insurance and damage to movable and immovable property, earthquake damage, flood damage.

• Restricted access: Neighborhoods and neighborhoods are easily cut off from the world in the event of infrastructure disruptions - roads, electricity , clean drinking water, health services. With them, evacuation may be difficult due to the lack or destruction of alternative routes.

• Regarding the distribution of forest areas by area and degree of risk of forest fires (Table 8).

Table 8

Danger	**Hot spots**	**Probable impact**	**Probability of occurrence**
City fires	Abandoned buildings, repair works on buildings and installations. Unregulated use of premises in buildings for storage of flammable materials.	Victims, burns, cremated homes, loss of household goods,	At any time with intensity during the winter months.
Forest and field fires	Forest and field areas.	Burned forest and field massifs in hard access areas.	Mostly summer months.
Waste	Unregulated landfills and tailings ponds	Polluted environment - soil, water, air. Chemical and radioactive contamination, poisonings, diseases and epidemics.	Always

Table 9 provides an assessment of the risk of fires in the Municipality of Dupnitsa, including the capacity to deal with them.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Table 9 . Fire risk assessment

FIRE RISK ASSESSMENT 2021 FOR DUPNITSA MUNICIPALITY								
DANGER TYPE	**CATEGORY**	**DANGER INCLUDED IN THE RELEVANT DISASTER RISK MANAGEMENT PLAN:**	**ASSESSMENT OF LIKELIHOOD DANGER TO OCCUR**	**ASSESSMENT OF MAXIMUM IMPACT IF THE HAZARD APPEARANCES**	**VULNERABILITY ASSESSMENT (parts from the community or infrastructure or economy)**	**THE MOST VULNERABLE AREAS IN THE CAPITAL MUNICIPALITY**	**OVERALL ASSESSMENT OF CAPABILITY CAPACITY**	**TOTAL RISK OF DISASTERS AND RELATIVE PRIORITY AND RATINGS, INCL. ALL FACTORS**
Danger of forest fires and city fires	Natural and human	angers of forest fire	Very likely (1+ in 6 months)	Moderate	Vulnerable	Rila Park, suburban and urban	Adequate	High - Area Low - Dupnitsa town

One of the strengths for dealing with disasters is a well-developed transport infrastructure and proximity to Sofia. Prepared team of professionals and volunteers. Conducting various trainings and trainings of the population and last but not least good attitude of the citizens towards the team and the possibilities of RSPBZN.

The challenge for better disaster management is an inaccessible environment for people with disabilities, lack of sufficient funding and hence equipment, off -road vehicles, fire towers, knowledge and implementation of GIS solutions and analysis products, creating scenarios and models for spread of fire, especially in forest areas.

10 . Analysis of legislation, strategies and policies at EU level for fire disaster management with a focus on fires

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

A brief overview of the regulations with brief comments.

The basic law for "Disaster Risk Reduction" is the Law on Disaster Relief .

Disaster Protection Act (SDA). The law reflects all phases of the disaster management cycle - prevention, preparedness, response and recovery.

The main strategic document at the national level is ***the National Disaster Risk Reduction Strategy.***

Another key document at the national level is the ***Strategy for the Development of Voluntary Formations for Protection in Disasters, Fires and Other Emergencies in the Republic of Bulgaria.***

To meet the objectives of the National Disaster Risk Reduction Strategy 2018-2030, it is necessary to develop a ***National Disaster Protection Plan and a National Disaster Risk Reduction Program.***

- "Disaster risk" are the potential losses in a disaster that may occur for a community, including life, health status, livelihood, assets and services, in a certain period of time (item 13, § 1 of the Additional Provisions);

- "Risk analysis and assessment" is the determination of the nature and amount of risk as a function of danger, vulnerability and probability (item 14, § 1 of the RTA).

laws that contain provisions related to the topic of "disasters".

The total number of by-laws is much larger - the ordinances issued on the implementation of the Law on Public Procurement are 10, and the total number of ordinances in the individual sectors directly related to policy is approximately 100.

Only for the period (2014 - 2018) the PPA has been amended 10 times . (last amendment and supplemented, SG No. 60 of 7 July 2020) , as the other laws directly related to the policy have also been amended many times (some tens of times), which could be perceived as an indication that the laws do not regulate primarily all public relations on the matter or that some of the public relations regulated in them are dynamic, ie. they are not permanent.

Disaster protection is provided at national, district and municipal level and is provided through:

1. conducting preventive activity;

2. conducting activities for disaster preparedness and response;

3. support and recovery;

4. resource provision;

5. granting and receiving aid.

At the national level , the Council of Ministers formulates and implements the state policy in the field of disaster protection.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

To support the implementation of the activities under this policy at the Council of Ministers, a Risk Reduction Council and the Interdepartmental Commission for Reconstruction and Assistance (ICR) at the Council of Ministers have been established to provide targeted funds from the state budget in connection with disasters.

The chairman of both advisory bodies is the Minister of Interior, who is responsible for the activities related to the protection of the population in case of disasters and emergencies (according to the Ministry of Interior). The Minister makes proposals to the Council of Ministers for amendment or repeal of strategic documents. Carries out control over the observance of the Law on Public Procurement.

The National Headquarters for Disaster Protection operates in the conditions of disaster and interacts with the regional, departmental and municipal headquarters for protection against disasters.

Directorate General for Fire Safety and Protection of the Population (DGSPF) has the functions of the Council Secretariat for Disaster Risk Reduction at the Council of Ministers.

According to the Law on Public Health, all activities for protection of the population in case of danger or disaster should be performed by the unified rescue system (ESS), which includes structures of: ministries and departments; municipalities; companies and sole proprietors; emergency medical centers, other medical and health establishments; Non-profit legal entities, incl. voluntary formations; armed forces.

The main components of the ESS are the General Directorate of the Ministry of Interior (which is the coordinator of the ESS), the regional directorates of the Ministry of Interior, the Bulgarian Red Cross and the centers for emergency medical care.

Source: Disaster Risk Management Technical Assistance Program - Bulgaria World Bank Goup

More than 20 executive and government agencies have direct commitments to specific risks and dangers associated with this policy.

Bulgaria is a member of the European Union Civil Protection Mechanism, which facilitates cooperation between European countries in the field of population protection. The EU mechanism aims to improve prevention, preparedness and response and provides an opportunity for active international cooperation in the field of public protection.

There are two main advisory bodies - the Council for Disaster Risk Reduction at the Council of Ministers to support the formation and implementation of state policy in the field of disaster protection and the Interdepartmental Commission for Rehabilitation and Assistance at the Council of Ministers. The status of the Disaster Risk Reduction Council of the Council of Ministers is of a permanent advisory body

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

The work of the Council for Disaster Risk Reduction at the Council of Ministers presupposes the participation at a high political level. It has been established that the meetings of the Council are attended mainly by authorized representatives of the members who hold expert positions or other non-managerial positions, which implies that they are not authorized to make important decisions within the competence of the Council. . [REPORT ON THE IMPLEMENTATION OF STAGE 2 - CONDUCTING A PILOT FUNCTIONAL ANALYSIS OF HORIZONTAL POLICY TO REDUCE DISASTER RISK REDUCTION] 19, para. 4 of ZA. The Minister of the Interior has the main powers under the Law on Public Procurement; the Minister of Defense, the Minister of Regional Development. In addition to the above-mentioned ministers, the following ministers also have specific powers under this policy: the Minister of the Environment and Water; agriculture, food and forestry; transport, information technology and communications; of energy; of health, education and science - in terms of training programs.

At the municipal level , municipal disaster risk reduction councils develop municipal disaster protection plans, which are adopted by municipal councils after consultation with regional disaster risk reduction councils.

There is a risk of overlap in the content of the planning documents under the Law on Public Procurement, prepared for Sofia-city district and Sofia municipality - in view of the fact that they refer to the same territory.

In order to fulfill the objectives of the National Program for Disaster Risk Reduction and in connection with the reduction of risks, which will be determined by the regional disaster protection plans, regional programs for disaster risk reduction will be developed. Annual plans will be adopted for their implementation.

In order to fulfill the goals of the regional programs for disaster risk reduction and in connection with the reduction of the risks determined by the municipal disaster protection plans, municipal programs for disaster risk reduction will be developed. Annual plans will be adopted for their implementation.

The mayors of municipalities, according to the Law on Disaster Management, control the development and implementation of the municipal program for disaster risk reduction and the municipal plan for disaster protection. They also control the implementation of urgent disaster recovery work. The mayors of municipalities have control powers under the laws outside the LPA (including according to the PA control the construction, maintenance and operation of water management systems under Article 19, item 4 of the PA).

10.1 Main normative acts related to DRR (disaster risk management) in Bulgaria

Source : Disaster Risk Management Technical Assistance Program - Bulgaria World Bank Goup .

10.2 EU legislation

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Source: Disaster Risk Management Technical Assistance Program - Bulgaria World Bank Goup

Every year, devastating forest fires occur in Europe and around the world, destroying thousands of hectares of forest. When the scale of a fire exceeds a country's capacity to put it out, the EU Civil Protection Mechanism can be activated to provide a faster and more effective response.

What are we doing?

The European Commission's Emergency Response Coordination Center (ERCC), the operational heart of the EU Civil Protection Mechanism, monitors the risk of forest fires and morbidity in Europe around the clock through the use of national monitoring services and tools such as EFFIS Forest Fire information system).

Natural fires

• The forest sector is managed through a system of strategic documents

They include:

The National Strategy for Development of the Forest Sector for the period 2013-2020,

Strategic Plan for Development of the Forest Sector 2014–2023, Program for Protection of Forests from Fires (2017), Regional Plans for Development of Forest Territories and Forest Management Plans, as well as programs and plans for protection and development. These documents have a different territorial scope.

• The strategic goal is the sustainable development of the forest sector by achieving a balance between the ecological functions of forests and their economic importance. One of the envisaged measures for the implementation of the priority is the increased efficiency in the prevention of forest fires.

• The main activities are (a) improving inter-institutional cooperation to prevent and detect illegal activities in forest areas, (b) modernizing the information systems of forest checkpoints and (c) strengthening monitoring and control by local authorities through agricultural activities. territories during the fire season.

• The DGCAP is recognized as an institutional participant and is responsible for developing the system together with the EAG.

• The information on the risk of forest fires is based on analysis and assessment conducted in 2016 by the Ministry of Agriculture and Food.

• The “risk of forest fires” is defined on the DGSP website as an assessment of the fire activity in the forests of a given administrative unit of the country (ie NUTS level 3), taking into account the average annual number of fires and the average annual burned area.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Water law

Water Act transposes European Union (EU) Floods Directive

(2007/60 / EC) and the Water Framework Directive 2000/60 / EC at national level, which

provide for mapping of coastal waters and flood risk assessments. Ц

Forest Act

The Forest Act (FFA) regulates public relations related to the protection, management and use of forest areas in the Republic of Bulgaria, in order to ensure multifunctional and sustainable management of forest ecosystems. The measures and activities for protection of the forest territories from fires are planned for each forest territorial unit regardless of the ownership of the territory and are obligatory for implementation. The planning of measures and activities for protection of forest territories from fires is financed from the state budget. The implementation and maintenance of measures and measures for protection of forest territories from fires is organized and carried out by the owners, respectively by the persons to whom the territory is provided for management, at their expense (Article 136 of the Forest Act).

The conditions and the procedure for planning the measures and activities for protection of the forest territories from fires are determined in Chapter Ten of Ordinance № 18 / 07.10.2015 for inventory of the forest territories. The leading administrative body in the procedure is the executive director of EAG. However, the competent structures of the General Directorate "Fire Safety and Civil Protection" are notified about the process - see Art. 139, para. 2 and Art. 141, para. 5 of the Ordinance. 22 The procedure for action of the voluntary formations and the specialized groups under para. 1 and 2 in case of extinguishing forest fires shall be determined by Ordinance № 8 / 11.05.2012 on the terms and conditions for protection of forest areas from fires.

Spatial Planning Act

The Spatial Development Act regulates the public relations related to the spatial planning, investment design and construction in the Republic of Bulgaria, and determines the restrictions on the property for development purposes.

Health law

The Health Act (PA) describes the general competencies of the executive bodies in the national health protection system.

Law on Veterinary Activity

The Law on Veterinary Medical Activity (ZVMD) defines the main powers of

Bulgarian Food Safety Agency (BFSA).

Environmental Protection law

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

The Environmental Protection Act (EPA) transposes Directive 2012/18 / EC 28 on the control of major-accident hazards involving dangerous substances.

Atmospheric Air Purity Act

The Clean Air Act (AACA) aims to protect the health of humans and their offspring, animals and plants, their communities and habitats, natural and cultural values from harmful effects, as well as to prevent the occurrence of hazards and damage to society in the event of a change in the quality of atmospheric air as a result of various activities.

Law on the Safe Use of Nuclear Energy . BEATS

ASUNE regulates public relations related to the state regulation of the safe use of nuclear energy and ionizing radiation and the safe management of radioactive waste and spent fuel.

Law on the Ministry of Interior

The Law on the Ministry of Interior (MIA)

Regulates the principles, functions, activities, management and structure of the Ministry of Interior and the status of its employees. The activities of the Ministry of Interior are related to the prevention, counteraction to crime, protection of public order, protection of national security, protection of rights and freedoms of citizens, border control, regulation of migration processes, fire safety and protection of the population through policy development, planning of activities and control of their implementation (Article 33 of the LMI). The Ministry of Interior outlines the activities related to fire safety and protection in case of fires, disasters and emergencies. In accordance with Art. 126 of the Law on the Ministry of Interior, the bodies for fire safety and protection of the population do not perform: fire-fighting and rescue activity and activities for protection in case of disasters in sites of the underground mining industry; state fire control in sites of the underground mining industry, the Ministry of Defense, the structures under the direct subordination of the Minister of Defense and the Bulgarian Army and the means of transport with the exception of agricultural machinery; disaster protection activities in the maritime areas of the Republic of Bulgaria

Law on Defense and the Armed Forces of the Republic of Bulgaria

The Law on Defense and the Armed Forces of the Republic of Bulgaria stipulates that the Ministry of Defense shall ensure, inter alia, the maintenance and use of the armed forces in disasters and participation in the management and / or overcoming of the consequences of disasters.

Law on the Bulgarian Red Cross

This law regulates the status and functions of the Bulgarian Red Cross. The Bulgarian Red Cross is the only national organization of the Red Cross on the territory of the Republic of Bulgaria. He is part of the international movement of the Red Cross and Red Crescent. The Red Cross also receives, stores and distributes aid provided by foreign countries, organizations and citizens for humanitarian, environmental, cultural and educational purposes.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Law on the Management and Functioning of the National Security Protection System The Law on the Management and Functioning of the National Security Protection System (ZFFZNS) regulates the management and functioning of the national security protection system.

Law on the National Emergency Call System with a Single European Number 112 The Law on the National Emergency Call System with a Single European Number "112" (ZNSSPIEEN112) defines the structure and functions of the national emergency call system with a single European number "112." T

Law on State Reserves and Wartime Stocks

The Law on State Reserves and Wartime Stocks (LRWA) regulates the management of state reserves and wartime stocks.32 This includes activities for their planning, creation, storage, conservation, renewal, maintenance, release, use, reporting, financing and control. Wartime stocks are material resources defined by a nomenclature list and intended to ensure in case of war or martial law the production of military products for the needs of the armed forces, the structures performing tasks of defense of the country, the national economy and the population for a period of time. , determined by the Council of Ministers with the general state wartime plan. The Ministry of Defense and the Ministry of Interior shall establish for their needs departmental wartime stocks under conditions and by an order determined by an ordinance of the Council of Ministers (Art. 3 of the LDA).

Energy Law

The Energy Act (EA) obliges the Minister of Energy to present a list of strategic sites of national importance in the energy sector, incl. and those extracting local solid fuels before the Council of Ministers for approval. The law provides for persons carrying out activities under the Energy Act through sites included in this list, carrying out activities and activities for work in disasters and in wartime, assigned to them by the Minister of Energy (Article 5 of the Energy Act. 4). The Minister of Energy conducts preventive, current and subsequent control over the readiness of energy facilities for work in case of disasters and in martial law Electronic Communications Act.

Electronic Communications Act (WEA)

The WEU specifies the conditions and procedures for providing electronic communications for disaster management within the meaning of the 49 Disaster Protection Act and for declaring a "state of war", "state of war" or "state of emergency" within the meaning of the Defense and Armed Forces Act. forces of the Republic of Bulgaria.

Climate Change Limitation Act

The Climate Change Limitation Act was adopted in February 2014. The Act outlines the overall policy to be pursued in order to mitigate climate change and its impact and fulfill international obligations under the UN Framework Convention on Climate Change and the Protocol. Kyoto, as well as the EU legal framework. The law defines the Ministry of Environment and Water (MoEW) as the institution responsible for climate change policy until 2030.

Regional Development Act

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

The RRA regulates the planning, programming, management, resource provision, monitoring, control and evaluation of the implementation of the system of documents for strategic planning of regional and spatial development. Strategic planning of regional development integrates regional and spatial development and covers the development and updating of a system of documents to reduce imbalances in the development of the national territory, taking into account territorial potential, including ensuring the development of cross-border, transnational and interregional cooperation.

Roads Act

The Law on Roads regulates the ownership, use, management, administration, construction, repair, maintenance and financing of roads, as well as the management of road infrastructure safety.

Road Transport Act

The Road Transport Act regulates the transport of dangerous goods on the territory of the country. This must be done in compliance with the requirements of the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR).

Law on Liability for Prevention and Elimination of Environmental Damage

The Law on Liability for the Prevention and Elimination of Environmental Damage (ZOPOESCH) regulates the responsibility for the prevention and elimination of environmental damage in compliance with the "polluter pays" principle and the principle of sustainable development. T

The Law on Administration authorizes the regional governor to organize and manage activities for protection of the population, cultural and material values, the environment in case of disaster (Article 31, paragraph 1, item 9 LA).

The Civil Servants Act provides for leave and benefits for civil servants who participate in certain disaster protection management activities (Articles 62 and 77).

The Law on Local Self-Government and Local Administration stipulates that local self-government is the right and real opportunity of citizens and their elected bodies to decide independently all issues of local importance that the law has provided in their competence, including protection of disasters (Article 17, paragraph 1, item 11 of the LGMSA). The mayor of a region or town hall is competent to organize and manage the protection of the population in case of disasters and accidents

Sources used:

REPUBLIC OF BULGARIA / MINISTRY OF INTERNAL AFFAIRS Consultancy services for accelerating the resilience of disaster risks (P170629) Draft RESULTS REPORT (4 December, 2020) Disaster Relief (DRB) and in particular preparedness, prevention, early warning and response.

Disaster Risk Management Technical Assistance Program - Bulgaria World

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

11. Study of good practices for natural disaster management with a focus on fires in municipalities of EU Member States

EU Member States develop and implement various mechanisms for disaster management, including and fires.

Most countries use existing tools, services and new technologies to provide an integrated sustainability assessment.

Platforms working on GEOSS have been developed and are being developed, seeing the current lack of a specific process for understanding and quantifying climate.

Use satellite and ancillary data available for GEOSS, DIAS, urban TEP, GEP and more. to monitor the effects of climate change (CC) on urban areas, the dangers of fires, droughts, landslides, etc., these projects focus on a solution for climate applications supporting measures to adapt and mitigate the impact of the Paris Agreement. Modern tools for remote monitoring and 3D-4D monitoring, machine learning / in-depth training of techniques and development of modular scalable , data-driven multilayer knowledge for monitoring urban areas are applied. By using time series of satellite data, spatial information and ancillary data, on-site monitoring systems will integrate detailed local level information of neighborhoods / building blocks.

The most commonly used programs focus on two pillars:

a) Natural and man-made hazards exacerbated by CC: urban floods, soil degradation and geohazards (fires, landslides, earthquakes, soil deformations), and

b) Man-made hazards: heat islands, urban heat flows, air quality, gas emissions from forest and urban fires.

The implementation of each of the practices takes into account and takes into account the local ecosystems of European urban areas, following an integrated and sustainable approach by including the initiative for active participation of communities, which includes the use of a social platform. Paying additional attention to sustainable urban development, one of the areas of public benefit, claims that the use of EO is a crucial tool for sustainable cities and the assessment of urban footprints, to promote justice, prosperity and shared prosperity for all, to feed new indicators of monitoring progress towards sustainable development goals in the EU context.

The impact of cities on anthropogenic climate change (CC) and the harmful effects of climate change on the well-being of citizens are significant. As CC intensifies, it has a serious impact (and is affected by the urban environment: loss of urban greenery, urban flooding, reduced air quality (AQ.

It is necessary to take into account emissions of gases (GHG), geohazards (landslides and soil deformation due to soil degradation), heat islands, urban heat flows, urban and forest fires, etc. In this way, European cities face major challenges, putting EU members under great stress in order to provide a more sustainable environment that maintains security, prosperity and public health.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

As a result, urban sustainability has become paramount. The consequences of any crisis depend on the city's readiness to respond to specific foreseeable impacts. As such, cities are taking steps to make them more sustainable with the ability to protect their residents and assets, but also to remain functional in times of crisis, encouraged by global agreements and local policies or regulations on climate change. CC has caused and will continue to cause pressure and uncertainty that will create challenges for society, the economy and the environment. To address this underlying problem, local authorities and other stakeholders need a solid framework and set of tools to anticipate and mitigate the effects of CC, and provide predictive impacts from their own solutions to design more sustainable cities. . However, there is currently no specific process for understanding and quantifying CC effects on urban areas using satellite and additional data available in GEOSS for Copernicus DIAS and urban TEP, GEP 4 platforms and others. and there are very limited urban development strategies for CC.

Disaster management and in particular fires use data from a huge range of sources, namely:

⁕ satellite , air , "cheap" terrestrial sensors such as e.g. _ maintenance -free microclimate stations (wind speed, humidity, temperature, soil moisture and temperature),

⁕ Autonomous fire towers with infrared monitoring, humidity, temperature, vibration, not only in forests but also in urban areas.

⁕ Information from the active participation on communities . Everything this allows of municipalities yes describe precisely urban sites and step up efforts to combat CC, geohazards and fires.

Open Urban Systems (CSOs)

(CSO) and digitalisation is a "rich" set of information using spatial and non-spatial data, used in a geographic information management system that provides spatial understanding of cities. CSOs provide data to be used for simulations of 3D models for demography and against events in spatial context for better understanding, mapping and early detection and disclosure. CSOs include cadastral mapping, utility mapping, demographic, population and socio-economic mapping, and spatial understanding of the distribution of the population in relation to environmental effects.

It is emphasized that digital models for visualization and analysis of spatial data and related information are used to represent real objects in GIS.

Usually the model of the real object in GIS is a separate layer, representing relevant objects and phenomena, such as terrains, plots, roads - Fig.9

FIG. 9 Sample layers of a real object in GIS.

In the practices of the EU countries, as well as the Bulgarian practices in Sofia Municipality, for example, citizens are increasingly involved as observers - active communities - Collective knowledge: Full use of the potential of the initiative "citizens as observers" is a key part of the strategy. most programs and projects in the EU. The active participation of citizens using

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

smartphones armed with low-cost sensors (new mobile solutions for community science) is encouraged. Customization of this equipment is already available, taking into account users' experience in using data quality and ease of measurement tailored to non-technically inexperienced people. In this way, an educational role is played, encouraging communities to get involved in solving environmental issues and to cooperate effectively with institutional and scientific components.

Directives of European legislation and other EU and US standards.

Fire-fighting and protective devices are regulated to some extent by European standards. European fire protection legislation consists of directives, construction and technical standards, compliance with which is mandatory for construction companies, manufacturers and suppliers of fire protection equipment.

Fire alarms are subject to several directives:

The Electromagnetic Compatibility (EMC) Directive first restricts the electromagnetic emissions of equipment to ensure that, when used as intended, such equipment does not interfere with radio and telecommunications as well as other equipment. The Directive also regulates the protection of such equipment against interference and seeks to ensure that such equipment is not affected by radio emissions when used as intended.

The EMC Directive operates at two levels, depending on the industry:

Industrial level. Electrical noise is allowed at this level, as powerful electrical machines create such interference.

Level of light (commercial) industry.

Most of the fire safety equipment does not create a high level of interference. The EN50130-4 standard has been published to cover the sensitivity of alarm equipment. The common standard for light industry is used for emissions.

The Low Voltage Directive (LVD) ensures that electrical equipment within certain voltage limits provides a high level of protection for European citizens and enjoys a single market in the European Union. With regard to electrical equipment within its scope, the Directive covers all health and safety risks, thus ensuring that electrical equipment is safe when used. The directive covers electrical equipment with a voltage between 50 and 1000 V for alternating current and between 75 and 1500 V for direct current. Most fire extinguishers operate on low voltage (24V), so this directive does not apply to them. The LVD Directive applies to fire alarm panels, relays or interfaces with rated mains and other equipment connected to the mains, such as door closers, vents, etc.

The Construction Products Directive (CPD), 89/106 / EEC, applies to any product manufactured for installation in construction works, including buildings and civil engineering. Alarms and smoke detectors must be certified by a third party in accordance with the harmonized European standard. This will often be part of the EN 54 standard (eg EN 54-2 for control and indication equipment, EN 54-3 for audible alarms, EN 54-7 for smoke detectors, EN 54-11 for manual call points, and etc.). Most parts of this standard have been harmonized or are in the process of

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

harmonization. After harmonization of the standards, their implementation will be required. So in the next few years, a third party presence will be needed.

Restricting the use of certain hazardous substances (RoHS) in electrical and electronic equipment aims to minimize the environmental impact of obsolete electrical and electronic equipment by reducing the amount of four heavy metals and two flame retardants . This directive does not currently apply to fire alarms and smoke detectors. However, it is likely that in the near future the scope of this directive will be extended to include more hazardous substances and materials used in electrical and electronic equipment that may be harmful to health.

The two broad technical standards EN 14604 and EN 54 apply to fire detectors in the European Union.

The European standard EN 14606 has been applied to all detectors since 1 August 2008. This European standard has been developed with a mandate from the European Commission to support the basic requirements of the European Directive 89/106 / EEC on construction products. It shall specify the requirements, test methods, performance criteria and instructions of smoke alarm manufacturers using the principle of propagation or transmission of light or ionization intended for household or similar residential use. Not applicable to alarm devices for installation in systems using control equipment and otherwise separated, these components are covered by the EN 54 series of standards.

Set of standards EN 54. Fire alarm and alarm systems.

Standards EN 14604 and EN 54 cover all technical requirements for fire detectors and their components and their compliance is mandatory in all EU countries from 1 August 2008. In addition, most European countries issue their own national technical standards, strengthening and also making changes to European standards. To enforce this, most countries include their own national standardization institutes and their certification bodies designated to bring the standards into line with each country's characteristics and to certify manufacturers in accordance with national specifications.

Most EU countries already have their own national legislation on fire protection of premises, but not for residential buildings. The volume and rigidity of the legislation have led to the existence of mandatory requirements for the installation of fire protection. Such requirements currently exist in several European Union countries.

Today, only a few countries in the European Union (UK, Netherlands, France, Finland and partly Germany and Belgium) have a legal requirement to install smoke detectors in residential buildings, and each year their positive experience attracts more and more countries to introduce such practices.

In most European countries, national technical standards are based on European or British standards. Each country is making changes in line with national characteristics and the need to strengthen existing regulations.

The WUI International Code is a model code designed to supplement the codes of buildings and fires in a jurisdiction. The purpose of the code is to establish minimum provisions for the protection of life and property from fire from exposure to fire in the wild and exposure to fire from

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

neighboring structures and to prevent the spread of fires of structures on wild fuels, even in the absence of fire involved of the department.

National Fire Protection Association

National Fire Protection Association (NFPA) codes and standards provide a practical and effective plan on how to minimize and manage forest fire threats. They include:

NFPA 1001, Standard for Professional Qualifications for Firefighters

Identifies minimum performance requirements (JPR) for career and volunteer firefighters whose duties are primarily structural in nature.

NFPA 1021, Standard for Professional Qualifications of Firefighters

Identifies the minimum JPR for firefighters.

NFPA 1051, Professional Qualifications of Wildland Firefighters . Identifies minimum JPRs for wildlife firefighters.

NFPA 1141, Fire Protection Infrastructure Standard for Land Development in Wild, Rural and Suburban Areas

Describes overall fire protection, roads, water sources, firefighting planning and land use issues related to general development. This standard provides planners, developers and communities with the information needed to develop fire protection infrastructure and emergency services to reduce the potential for fire damage and other impacts of land use change in an area. Suburban and rural areas that have inadequate fire service resources, extended fire response time, limited access and unusual terrain must be planned in advance to prevent loss of life and property as a result of the fire. The standard directs the user to topics such as means of access, separation of buildings, fire protection, water supply, emergency preparedness and fire service capabilities.

NFPA 1142, Water Supply Standard for Suburban and Rural Fire Fighting

Defines the requirements for water flow and supply, engineering standards and alternative systems for providing adequate water in rural and suburban environments.

Wildland Fire Management Standard

Provides minimum requirements for fire protection organizations in the management of wildfires, including prevention, mitigation, preparation and extinguishing.

NFPA 1144, Standard for Reducing the Ignition Hazards of a Wildland Fire Structure

Provides a methodology for assessing fire hazards in the wild around existing structures, residential buildings and units. It also assesses improved property or planned property improvements to be located in the Wildland area. Urban Interface (WUI) and provides minimum requirements for new construction to reduce the ignition potential of the structure from wildfires. provides the user with the necessary information to perform a thorough inspection of the structure and take further action to protect this structure from fires. The standard focuses on the area around the

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

structure, known as the ignition zone of the structure, which extends outward approximately 61 meters and 360 degrees around the structure. The correct construction characteristics, building materials, landscaping and fuel modification techniques throughout the ignition zone of the structure are described in detail in the standard. When paired with NFPA 1141, these two standards reflect the principles behind the NFPA Firewise ® Community Program. The Firewise Community Program , co-funded by the U.S. Department of the Interior, the U.S. Department of the Interior, and the National Forest Service , educates the public about what it can do to reduce fire losses and encourages voluntary joint action to fire safety for residents of WUI communities. Her Firewise recognition program Communities / USA® has included more than 700 neighborhoods in 40 countries.

NFPA 1906, Wildland Firefighting Standard

Defines the requirements for new automotive fire extinguishers designed primarily to support wildfire extinguishing operations, including apparatus equipped with a sliding fire extinguisher module.

NFPA 1977, Protective Clothing and Firefighting Equipment in the Wildland

Establishes requirements for protective clothing and equipment for protection against adverse effects on the environment encountered by personnel performing fire operations in the wild.

NFPA 1984, Respirators for wildfire firefighting operations

Provides comprehensive airway protection requirements for wildlife firefighters from inhalation hazards in non-IDLH (immediately life-threatening or wild) environments.

Forest fires have contributed to the rejuvenation of forests, lawns and other wilderness throughout history, and it may seem strange to talk about solving a "problem" that is a necessary part of a healthy ecosystem. But industry professionals are realizing that firefighting alone is not the answer to forest fires; instead, a combination of preventive measures and mitigation efforts may be the best approach. Techniques such as vegetation management and prescribed burning can make a long way to reducing the impact of forest fires on an area. We must also take into account where and how we are developing in WUI. As we continue to develop areas that are fireproof and previously uninhabitable, planners, developers, business owners, homeowners and fire protection organizations must do their part to prepare for and reduce forest fires. minimum their impact.

All these aspects and many others are supported by NFPA standards, which provide planners, developers, business owners, homeowners and firefighters in WUI with guidance on land development, structural fire hazards, water supply and forest fire management. , to name just a few. However, the requirements of these standards are not applied by local authorities unless they are authorized by local ordinance or adopted by state law. Currently, the NFPA does not offer a comprehensive wildlife-urban interface code for state and local adoption, but it is important to recognize that the NFPA has the resources available to address many of the dangers of fire and loss of life and property. .

11.1 Luxembourg

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

In 2008, there were more than 2,300 fires in Luxembourg. The estimated cost of fire damage is tens of millions of euros each year. More than 50 companies suffer from fires every year in Luxembourg. More than half of these companies close their doors in five years.

There are no national fire standards in Luxembourg. Luxembourg applies European standards, especially the German DIN or VDE standards. Fire safety regulations are also initiated by the Labor Inspectorate for so-called "classified enterprises" and by the Fire Prevention Service of the Professional Fire Brigade of Luxembourg. General regulations - based on Belgian regulations - divide buildings according to their height. Specific regulations - based on French and German regulations - distinguish between unclassified (all types of housing) and classified establishments (eg the number of people to be accommodated in a concert hall, office building area ...). There are also specific rules - based on the European Building Materials Directive - for all types of architectural / constructional cases (eg restaurant, cinema, underground car park, etc.).

Luxembourg intends to step up cooperation with the European Fire Protection Association as the CTIF Commission cooperates in developing common security standards to achieve common standards in Europe. The guidelines are designed primarily for the safety of? companies and organizations, as well as fire or insurance companies.

Today in Luxembourg, the Kommodo-Inkommodo Act classifies buildings according to their potential danger to people and the environment. Recently, however, the law has been adapted to purely environmental protection and now does not affect fire protection much.

In the 1990s, the Luxembourg government tried to create a national fire protection law, but that attempt failed. Today, Luxembourg does not have appropriate fire protection legislation. Under the Komodo-Incomodo Act , a number of directives regulating fire safety were published in 2003. Today, these directives are used as technical regulations and are therefore not controlled by Brussels.

11.2 Germany

Municipalities have an obligation within their field of activity to ensure that fire and explosion hazards are eliminated and fires are effectively extinguished (defensive fire protection) and that sufficient technical assistance is provided in case of other accidents or emergencies of public interest. (technical assistance service).

To perform these tasks, municipalities must establish, equip and maintain municipal fire brigades within their capacity.

They must also provide and maintain the necessary fire water supply systems within these limits.

Legislation requiring municipalities to take structural or operational measures to prevent or limit fires (preventive fire protection) remains unaffected.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

(1) The protection from fire dangers (defensive and preventive fire protection) and the rendering of assistance in case of accidents and emergency situations (assistance) shall be tasks of the municipalities and the districts, as well as of the state.

(2) The fire protection and the assistance shall be the responsibility of the municipalities and the districts as tasks from their sphere of activity.

Tasks and powers of the municipalities

Municipalities are responsible for defensive fire protection and assistance in their area. To perform these tasks, they must create, equip, maintain and deploy an effective fire brigade that meets local conditions.

To this end, they must have the necessary systems, means, including special fire extinguishers and equipment to ensure a basic fire water supply, provide initial and further training for members of their fire brigade, and draw up and update an action plan; and to perform exercises.

The municipality is obliged to provide assistance to its fire service at the request of another municipality or at the request of its supervisory body, if this does not endanger the defense fire protection and assistance in its area. In the case of a large independent city, the district takes the place of the supervisory authority.

Municipalities are responsible for providing fire protection .

If there is an increased risk of fire from construction or other use of property or if in case of fire, explosion or other damaging event this would endanger the life or health of a large number of people or a special danger to the environment, the municipality may oblige those responsible construction legislation (§ 56 of the Lower Saxony Building Code) to have the water reserve available, including special fire extinguishers and equipment needed to put out fires and provide assistance outside local conditions or to make them available to the municipality for extinguishing, necessary for extinguishing a fire.

Create and update fire service plans and make them available to the community.

Employees of the municipality have the right to enter and inspect the specified properties and facilities in order to verify the requirements based on the rules of construction.

Municipalities with a population of over 100,000 must establish, equip, maintain and deploy a professional fire service,

Municipalities without a professional fire brigade must establish, equip, maintain and deploy a voluntary fire brigade.

Municipalities with a professional fire brigade must establish, equip, maintain and deploy a voluntary fire brigade in addition to the professional fire brigade if this is necessary to carry out the tasks. The volunteer fire brigade to be organized independently.

The volunteer fire brigade has an operational department. In addition, other departments may be set up, in particular children's and youth fire departments, as well as senior, honorary and music departments.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

The volunteer fire brigade is divided into local fire brigades for the district.

The disbandment of a local fire brigade requires the approval of the supervisory authority.

In the case of local fire brigades in a large independent city, the approval of the administrative district is required instead of the approval of the supervisory authority.

Approval is given if fire protection and assistance can be provided without this local fire brigade.

Children's and youth fire brigades are used in particular to recruit young people for fire brigades.

Communities are called upon to encourage and support them to the best of their ability.

Anyone who has reached the age of 6 but has not yet reached the age of 12 can be a member of the children's fire department.

Anyone over the age of 10 can be a member of the youth fire brigade.

Membership ends at the end of the calendar year in which the 18th year of life ends.

The members of the youth fire brigades should take part in the training service provided for them.

They may only be used for activities which, under the circumstances, do not endanger life or health.

Fire safety training should enable children and fire safety training to enable adults to recognize fire hazards, behave properly in the event of a fire and take simple self-help measures .

Municipalities are called upon to promote and support fire safety training to the best of their ability.

Fire protection

Events and measures in which there is an increased risk of fire and in which a large number of people or significant property would be endangered in the event of a fire may be carried out only in the presence of fire protection.

The organizer or the person who initiated the measure must request fire safety from the municipality in whose area the event will take place.

Fire safety is provided by the municipal fire service by order of the municipality.

If events or measures take place within a company or public institution with a construction fire brigade, the organizer or initiator must ensure that fire safety is provided by the construction fire brigade, as far as is available for this task.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

The fire chief may issue orders necessary to prevent and repel fire hazards and to provide routes for evacuation and attack.

Fire protection

In Lower Saxony, the competent authority is responsible for fire protection and assistance in the area. To this end, it must, inter alia, establish, equip, maintain and deploy an effective fire brigade in accordance with local conditions. The members of the volunteer fire brigades perform their service on a voluntary basis.

The members of the voluntary fire brigades have a legal right to loss of income and in some cases to the granting of a cost allowance in accordance with the municipal statute.

11.3 BELGIUM. Brussels, Ixel municipality

The city of Brussels has a population of 148,873 (1 January 2008), with a population density of 4566 people / km². Together with the 18 communes of the Brussels-Capital Region, the agglomeration forms the largest (and at the same time one of the most densely populated) city in the Benelux with a population of 1,048,491.

FIG. 10 Administrative division of Brussels. Source: Internet

The Ixelles region is one of 19 municipalities in the Brussels-Capital Region of Belgium. Located southeast of the center of Brussels, it is geographically divided into two parts of the city of Brussels.

As of January 1, 2020, the municipality has a population of 87,632 inhabitants. The total area is 6.34 km 2 , which gives a population density of 13 679 / km 2. Like all municipalities in Brussels, it is legally bilingual (Franco-Dutch). It is generally considered a rich area of the city and is especially famous for its communities of European and Congolese immigrants.

11.3.1 Total for fire services in Brussels

The fire service is part of the "Service d'Incendie et d'Aide Medical Urgente "(Fire and Emergency Medical Service or SIAMU) of the Brussels-Capital Region. There are nine fire stations and almost a thousand professionals throughout the Region.

In addition to preventing and combating fires, SIAMU also provides emergency medical services in Brussels through its centralized number 100 (and the single emergency number 112 for the 27 countries of the European Union).

Ixel municipality has a dense urban structure with very few green areas and there is a problem with air pollution. Ixel has been severely affected by CC, leading to severe storms, urban flooding, air pollution and urban heat flows. As the city has old structures, the common effect of torrential rain is the overflow of sewage, which leads to large amounts of water and mud in traditional cellars, etc. CC is characterized by a 30.6 ° C difference in temperatures throughout the year and a 21 mm difference in precipitation between the driest and wettest months. As a densely built-up area, with mixed buildings and structures.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

The age of construction varies from the 18th century to modern, these problems caused by climate change are important not only for the built environment, but also for citizens in general. Figure 10 shows the built-up density of the area as provided by Urban-TEP31.

Figure 10. Built-up density 2012 (GUF- DenS 2012) (Source: Urban -TEP)

According to the "PLAN TRIENNAL 2019-2021" of the municipality of Ixel , the priority is a strategy for ecological, economic and social transition, which will aim to obtain measures for climate change and air quality, following the objectives of the Paris Agreement. In addition, as air pollution is a major problem, the municipality of Ixel has planned regular air quality measurements, especially around the most sensitive axes and buildings (schools, retirement homes, hospitals, public places, etc.) and has made public its in connection with the problems with district heating. In order to reduce fuel consumption and better planning, as part of the Air-Energy-Climate Energy Action Plan, a list of insulation works on facades and roofs is envisaged, taking into account the protection of the building heritage. The list of actions also includes the protection of plantations and new plantations from fires and the protection of waters for the protection of natural spaces, but also the creation of five (5) new parks during the term of the legislature, in particular by opening new accesses to existing spaces and their integration, part of revitalization programs to enhance their impact and create new dynamics;

The municipality's experience focuses on climate change to provide urban planning guidance on the potential long-term impact of urban transport policies in different climate change scenarios. This case will see the creation of urban air quality and flood indices and their application to climate change implementing scenarios based on different planning scenarios. The historical baseline is formed by assessing:

1. Traffic - data from the Belgian traffic counting database managed by Brussels Mobility , as well as an assessment of the daily satellite images provided by Planet .

2. Air quality - access to CAMS pollution data for the period under review, as well as official and open air pollution monitoring data from Brussels. A comparison is made between these data to ensure that the open source data is sufficiently representative to be applicable.

3. Weather - the data from the local station and the model are analyzed, especially the variable humidity, precipitation, temperature and wind.

By comparing these datasets in detail and applying a number of statistical approaches, HAR MONIA creates a link between these variables. Ixelles urban planners can then implement a number of traffic management options and see the directly projected impact on local air quality in their city.

11.3.2 Tihange plant , Belgium

The plant has developed an ambitious program to reduce fire hazards and improve fire safety. This program is guided by plant management and has led to improvements in staff behavior, training, firefighting equipment and facilities:

The plant has developed a specific training program for firefighting simulator.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

As part of the plant's ongoing initiative to minimize the impact of an event, such as smoke, self-ignition or an emerging fire, on plant safety, the plant has developed a specific simulator fire training program. This training includes various stages, starting with theory and ending with practical firefighting exercises.

The plant uses a simulator in its training center to improve staff training for practical exercises. This simple, mobile, flexible system provides training for proper work practices and the use of appropriate equipment in a wide range of situations simulated on a wide screen.

The simulator is controlled by a specific computer program consisting of a screen showing the situation, a touch-sensitive pad on which the trainee stands, and a set of fire extinguishers equipped with sensors. The simulator accurately reproduces the development or control of the fire based on the actions of the trainees, such as the choice and use of the type of fire extinguisher, distance from flames, etc.

This simulator has improved the effectiveness of training, thanks to:

- Multiple scenarios and fast development: more content in less time.
- Simulates almost real conditions without the associated disadvantages: there is no need to create a fire and therefore no pollution, less stress for trainees, who as a result are more receptive to information.
- Easy to implement: centralizes training resources in the plant, significantly reduces travel costs and effort (lost time, fatigue, transport risks, pollution).

The plant published a brochure: "Management of mobile fire loads".

The leaflet provides information and advice in a convenient format that is accessible to all workers, setting out the basic principles of mobile fire load management, with a few selected illustrations.

It lays down the relevant products and rules for out-of-storage storage, the use of a fireproof cabinet and temporary storage. One section shows the "movable fire load sheet".

This sheet is crucial to ensure in-depth protection of equipment elements and to develop attitudes towards issues. It describes in detail the storage areas and their capacity (the nature of the products and the maximum quantities allowed), which are determined by the capacity to detect and protect the premises, the distance from each ignition source and the lack of safety-related equipment.

This flyer is a simple, inexpensive method that grabs people's attention and gives them extra reminders. It is sent to each staff member individually by mail and is also available in racks located in areas where people pass. It was also published on

Public Terminal Terminal (PAT) television screens installed in more than twenty areas of the site.

11.4 Municipality of Milan

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

The Municipality of Milan is the local public body responsible for providing a large number of services throughout the city (education, social services, economic development). In recent years, the city government and the City Council have made several decisions to tackle climate change on an urban scale. The city administration is part of the 100 sustainable cities, C40, Eurocity ; He is one of the signatories of the Global Covenant of Mayors and now defines the "Air and Climate Plan" for a better and healthier city with a horizon of 2050. All these initiatives aim to increase the city's capacity to become more resilient, sustainable, intelligent and round on a local scale.

In 2015, the city of Milan joined the 100 Resilient network Cities , founded in 2013 by the Rockefeller Foundation, aims to help cities around the world become more resilient to the physical, social and environmental challenges of the 21st century. Two years later, in December 2017, the Urban Sustainability Department of the Municipality of Milan officially joined. The role of the Sustainability Department in Milan is to implement strategies and plans that will reorient the city to a future in which citizens and economies can thrive in a sustainable, green and innovative atmosphere.

In the first year, the municipal team worked with citizens and local stakeholders to understand the current and perceived challenges facing the city in terms of "shocks" and "stress", especially related to climate change.

From this point on, the city's sustainability department has identified thematic areas in which action plans and strategies for future steps will be identified. Since the issuance of the Preliminary Sustainability Assessment of the City of Milan in December 2018, the Department is constantly working to strengthen the efforts of the Municipality to participate in projects and actions involving the socio-economic and environmental sphere of urban sustainability. Today, there are dozens of initiatives in which the department participates, gathered in three main research areas: Procedures and Services; Spaces and infrastructure; Communities and populations.

Milan is a city in the Lombardy region, Italy. Milan is the second largest city in Italy with 1,400,000 inhabitants with a population density of 7,272 inhabitants / sq . Km . Milan is the economic capital of the country and is one of the largest industrialized areas in Europe, creating great economic opportunities for more than 5,000,000 citizens living in its urban area and at the same time a threat to the well-being of the region's ecosystems. Milan is considered one of the world's leading cities, with a strong profile in specific areas such as fashion, trade, design, events and tourism. In 2015, it hosted the global EXPO and is scheduled to host the 2026 Winter Olympics in collaboration with Cortina d'Ampezzo . Milan is one of the "Four Bikes for Europe" and is recognized as one of the four fashion greats.

Milan is affected by very specific climatic conditions due to its position in the river valley, which is combined with a high industrial presence in the valley and a large population density creates conditions of high pollution throughout the year. In addition, the city of Milan is characterized by a high level of urbanization, with a high percentage of land use and permeable surfaces. This scenario generates threats to the city and the health of citizens through the urban heat island effect and the risk of flooding, which is increased by the presence of underground rivers, rising water levels and the amount of concrete poured into the city. In 2018, the Municipality of Milan commissioned the regional environmental protection agencies Emilia - Romagna and Lombardy to prepare a Local Climate Profile for the city of Milan. This document provides both a climate analysis from 1961 to

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

2017 and a forecast for climate data until 2050. They predicted that in Milan over the next 30 years there will be an increase in heat, waves and tropical nights, a decrease in cold days in winter, reducing the cumulative annual precipitation and increasing the maximum number of consecutive days without precipitation in all seasons except autumn. In addition, temperatures will continue to rise, with minimum temperatures rising between + 1.3 ° and + 2.2 ° and maximum temperatures rising between + 1 ° and + 2.4 ° from 1961-2017.

The City of Milan (Citta di Milano - CDM) intends to act to tackle these phenomena and against the effects of climate change. In 2017, as part of the membership network 100 Resilient Cities , Milan has set up a Resilient project department Cities . The department, together with the CRO and DCRO of Milan, developed the Preliminary Sustainability Assessment (PRA) of the city of Milan, a comprehensive analysis of the state of sustainability of the city; and completes the development of the Milan Sustainability Strategy, in which nature-based solutions, such as urban afforestation or SuDS , play a leading role in strengthening the city's resilience to major shocks and stresses. CDM is currently part of the Global Network for Sustainable Cities. The CDM is also developing the first air and climate plan, an integrated action plan to identify air quality measures and to mitigate and adapt to climate change.

Under this plan DP Resilient City is preparing guidelines for the city's adaptation to the climate.

A change whose innovative approach focuses on identifying key local risks (such as the effects of urban heat island, extreme rainfall, floods and fires) to turn them into opportunities for urban regeneration. In addition, the Milan Spatial Planning Plan (PGT), approved in October 2019, introduced in its vision for 2030 a sustainable approach to urban planning, with a focus on increasing the permeable space in the city. Finally, the Environment Transition Directorate, from which DP Resilient Cities is part of September 2019, is committed to implementing the regional regulation of hydraulic invariance. The CDM signed the Covenant of Mayors and the Global Covenant of Mayors and Governments on Climate Protection. The municipality is also a member of several international networks, such as Eurocities , C40 Cities Climate Leadership Group, Urban Development Network . The vision is for Milan to become not only an economic and tourist attraction, but also to further expand its global urban nature and to engage with the wider international community to tackle and solve global problems such as the CC. The PGT vision is set for Milan in 2030, which is:

- Connected city, metropolitan and global;

- City of opportunities, attractive and inclusive;

- Green city, habitable and sustainable; One city, 88 neighborhoods to be called by name ; A city that se self-regenerates .

11.5 Municipality of Athens

Located in the central valley of Attica, Athens is surrounded by 4 mountains - Egaleo to the west, Parnita to the north, Penteli to the northeast and Himetus to the east. The highest among them is

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Parnita - 1 413 m, the main part of which has been turned into a national park. To the southwest, the Attic Basin is open to the Saronic Gulf of the Aegean Sea.

The city itself is built around several hills, such as the Acropolis and Lycabettus , the highest hill in the modern city with an altitude of 277 m. The rivers Kifis and the smaller Ilis and Eridan pass through Athens .

The average daily maximum temperatures in July (1955 - 2004) are 33.7 ° C at the weather station in Nea Philadelphia, [8] but in other parts of the city it may be hotter, especially in the western regions. [9] [10] [11] During the proverbial heat waves in the city, temperatures often exceed 38 ° C. [4] [12] Athens holds the record of the World Meteorological Organization for the highest temperature measured in Europe - 48 ° C, registered in the suburbs of the city on July 10, 1977. [13]

Like other large cities located in valleys, such as Sofia, Los Angeles or Mexico, Athens is characterized by temperature inversions, which contribute to greater air pollution. As in most large cities, in Athens, human activity creates the effect of an urban heat island, which changes the temperature in the city compared to neighboring non- urban areas, having a negative impact on energy consumption and cooling and healthcare costs.

Athens, includes the current regional units of Central, North, West and South Athens with a total area of 361 km² and a total population of 2,640,000 people (2011).

The Athens agglomeration also includes the Piraeus district and has an area of 412 km² and a population of 3,090,000 (2011).

Piraeus is a port city in the region of Attica, Greece, located within the Urban Zone of Athens. Piraeus is the country's largest industrial testing center while at the same time the largest passenger port in Europe and the third largest in the world based on travel records, a fact that makes the municipality of Piraeus a vital part of the Greek economy.

The population living in Piraeus has decreased by almost 20% in the last three decades, while remaining one of the most densely populated municipalities in Europe. The process of urbanization in recent decades in Piraeus forms the conditions for ecological degradation of the city. Lack of free spaces and parks, high density buildings, lack of infrastructure and air pollution (mainly due to emissions from cruise ships) are considered to be the main environmental challenges for the city of Piraeus today. According to the Köppen climate classification, Piraeus has a hot semi-arid climate and according to the climate atlas of the Greek National Meteorological Service, this is the only area in Greece with this type of climate. Due to the summer night dry breezes in Athens, Piraeus recorded a high minimum of summer temperatures, while the average annual temperature was 19.4 ° C, making Piraeus the warmest region in Continental Europe. In addition, the area has active faults and is on the shoreline, leading to sinking / local effects of soil deformation. The Piraeus region has been subject to soil subsidence due to groundwater abstraction since the 1960s (Geor gopoulos and Teleioni , 2010), with total surface droplets of the order of tens of cm being concentrated mainly where alluvial sediments are present. Large drops in water levels have been observed in line with the highest subsidence values, with the groundwater surface being a few meters below sea level, a condition that favors the inflow of salt water and possible groundwater pollution.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Every summer forest fires are a real plaque in Greece destroying thousands of acres of forest. In July 2018, more than 100 people lost their lives and more than 180 were injured in a devastating forest fire in Mati , East Attica.

The municipal authorities in the municipality of Athens are constantly ready to take preventive measures in case of hot weather signals and strong winds, which increase the risk of forest fires.

Access to green parks, including the National Garden in central Athens, as well as forest areas such as the Kairariani Hills and Lycabettus Hill, is ready. Teams are organized to make walks in the parks and hills of the city.

The municipality has developed a procedure and technical capacity for cooperation with the residents and visitors of the city. A 24-hour telephone line has been launched to report signs of fire, as well as the Novoville application . Novovil , as the application says, in a pilot test from October 2018 to March 2019 received 22,500 requests and returned 8,500 SMS messages and 2,500 notifications to the people of Athens.

135 specially trained municipal staff are ready to deal with everything that citizens could report, ie. problematic road lights, construction defects on roads or sidewalks, abandoned cars or more urgent accidents that require an immediate response from municipal authorities. The application tracks the reported location and when a report is processed or a problem is successfully resolved, the person receives an update on their mobile phone or tablet.

Through the Novel app , municipal authorities can also inform residents and visitors about various events and activities, including emergency actions or important messages, as well as get people's thoughts on many issues and subjects by conducting opinion polls. Novil is available on smartphones and tablets running Apple iOS and Google Android and it's completely free.

11.6 Sweden Stockholm

Stockholm is a municipality in the county of Stockholm, with a population of 1,372,565 people in the inner part of the city, and together with the suburbs and the county - 1,823,210 people.

The municipality of Stockholm or the city of Stockholm has the largest population of the country's 290 municipalities, but one of the smallest, making it the most densely populated. It is also the most densely populated municipality in the Scandinavian countries.

One of the most important tasks facing the municipality is to make an effective early warning in the context of civil protection. The concept of civil protection used by the European Union refers to the protection of people, the environment and property in the event of man-made, technological and natural risks or emergencies.

Early warning is an essential element of any functioning civil protection system.

In addition, some detailed case studies are proposed in areas such as climate change, floods and spatial planning, the sudden rise of seawater, power outages and maritime safety in a cross-border context, fires.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Forest fires are not common or widespread in Sweden. According to a report published by the International Forest Fire News, only a few hundred hectares (100 hectares is equivalent to 1 square kilometer) generally burn during wet summers, and several thousand hectares burn during dry summers. This is less than 0.02 percent of Sweden's total forest cover.

Fires occur in most years, but not like the fire in August 2014. It is not clear how it started, but in one week the fire grew and became the largest in four decades . By August 8, 2014, the fire had burned more than 150 square kilometers, killing one person and forcing thousands to evacuate their homes. Satellite imagery captured a natural color image of the fire on August 4, 2014. Numerous smoky trails rise from the perimeter of the fire and blow northwest in the wind. The burnt forest looks brown; unaffected forests are dark green; agricultural land is light green; and the fields of the tail are dark.

Fire in Sweden - August 4, 2014. Source: Operational Land Imager (OLI) on Landsat 8

Hot and dry weather exacerbates the fire, emphasizing vegetation and priming it to burn. With a high-pressure system parked over Scandinavia, suppressive heat appeared in Sweden in July and August, bringing record or near-record temperatures to many cities and towns. In Sala, a town near the fire, temperatures rose to 34.7 ° C (94.5 ° F) on August 5th. Average temperatures are around 70 ° F (21 ° C) in early August.

The municipality cooperates with various institutions, universities, neighboring countries to improve the opportunities to receive early warning to citizens not only of the municipality but also of neighboring districts and guests of the capital and the country. The responsible authorities correctly understand that every project, especially those financed by the EU, needs highly qualified administrative and financial specialists to perform the complex tasks related to budget management and financial reporting. Also, the municipality has the capacity of specialists to deal with any challenges in the implementation and management of early warning and response to fires and other disasters.

Early warning and civil protection is a framework for analysis and action consisting of five "phases" of the system.

Early warning begins with a risk assessment, followed by prevention, which must somehow prove that the early warning system works. The third phase is that of monitoring the risks in order to detect possible early warning signals. The fourth phase is the dissemination of warnings. Finally, early warning involves a response, in the sense that the response may be more or less timely.

The point is to issue early warning signals as early as possible so that there is more time to react to preventive actions, preparatory measures or timely response. Although it is impossible to predict or prevent some situations in time, their possibility can be taken into account in the risk assessment and thus we can always prepare for them in advance. Early warning does not always work. This damage may be the result of separate or simultaneous damage within one or more of the above phases.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Sometimes the risk assessment fails because even when the information was available, it was not recognized as an early warning of potential risk. Sometimes weak or even clear early warning signals are lost due to the surrounding "noise".

Sometimes warnings are triggered, but they simply do not trust the authorities or people at risk, or for other reasons that are not followed by an early response. Then the question is to ask when or not an early warning signal is identified and what explains whether this signal leads to a successful early action or not. The municipality has developed procedures that raise citizens' awareness to answer the question "Why is the early warning signal ignored, even when it is clearly received?"

Through effectively developed regulations, companies are obliged to take various protective and preventive measures against the occurrence and spread of fire.

11.6.1 Forsmark , Sweden, brief example

Effective fire cell management

Fire cell monitoring - Fire cells divide fire-hazardous equipment into separate compartments to prevent the spread of fire and smoke. To monitor the integrity of the fire cells, each door in the fire cell is monitored and an alarm is triggered if the door is open for too long. (Fig. A) This function guarantees a high standard for the integrity of fire cells, even during interruptions. Anyone who is in the factory and finds an open door of the fire station must close it. If this is not possible, the shift supervisor must be notified immediately.

Fire cell service openings - Service openings are used during operation whenever possible.

When used, they are sealed with specially designed sealed bags. (Fig. B) This function ensures that the fire cells are closed even during operation in the installation

FIG. and FIG. b

Adaptive fire detectors - The fire alarm system can be adapted (with increased or decreased sensitivity) to the actual working situation in specific premises of the enterprise. Changes can be made through a computer software application, for example: when hot work is performed or a vehicle enters the factory. Fire detectors are always ready to monitor the condition of the fire; there is no need to turn them off completely. The sensitivity of the fire alarm monitoring system is determined by the fire brigade when issuing the fire protection directive as part of the permitting process.

11.7 Municipality of Paris

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Area: 105 km 2

Population (2016): 2,190,327 inhabitants

We will look at a specific fire service in Paris - the Paris Fire Brigade (French: Brigade des sappers-pompiers de Paris , BSPP)

The BSPP is a French army unit that serves as the primary fire and rescue service for Paris, the inner suburbs of the city and certain sites of national strategic importance.

The main area of responsibility of the brigade is the city of Paris and the surrounding departments of the Seine-Saint-Denis, the Val de Marne , and the Haute -de-Seine (the petty Crown). It also serves the Kourou Center, the DGA Military Missile Test Center in Biscaros , and the Lak Gas Field. As with other French fire services, the brigade provides technical rescue, search and rescue and fire prevention services, and is one of the providers of emergency medical services. Emergency services (EMS), also known as ambulance services or paramedics , are emergency services that provide emergency pre-hospital treatment and stabilization for serious illnesses and injuries and transport to final care. They may also be known as First Aid Squad, FAST Squad, Ambulance Squad, Ambulance Squad, Line Corps, Rescue Squad.

With 8,550 firefighters, it is the largest fire service in Europe and the third largest city fire service in the world, after the Tokyo Fire Department and the New York City Fire Department. Its motto is "Save or Perish "(French Sauver yes peri ").

The selection and training of employees is very strict. The first period lasts two months, with first aid and first reaction training, and basic military instructions. They then undertake a four-month practical training in an operational fire company; this includes participation in personal assistance and community safety operations. The last stage of training is another two months. After completing the training, the firefighter joins a fire company.

11.7.1 SECUREVI Emergency Response Information System

SECUREVI is an on-site emergency software program that maps the site in detail with click icons for each building that allow users to display operational information about the building as well as 360-degree images of the interior and exterior of the building.

The software - installed on a laptop on board the emergency command vehicle on site - also allows graphical information about the tactical situation in real time (details of hazards such as smoke / flames, current risks, response teams / equipment, deployed and planned actions) to be superimposed on interior and exterior images of buildings.

SECUREVI supports real-time crisis response teams. It can also be used for training purposes and to gather operational experience after an event (the software records details of an emergency event on a minute-by-minute basis).

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Originally developed for public emergency services, SECUREVI is designed to meet the station's operational needs. Bugey is a pilot site for software implementation.

12. Conclusion

The Municipality of Dupnitsa, as well as every municipality in the territory of the Republic of Bulgaria, is exposed to climate change such as floods, fires and severe winters, droughts, and are exposed to many single and related risks given the common environmental characteristics.

Based on the definition and classification of natural disasters, forest fires are classified into a group of natural climatological disasters.

Municipalities, Forestry, etc. according to their strengths and capabilities, they try to prepare an up-to-date analysis of the risk of fire hazards and to ensure and maintain constant readiness of the communication and information systems, such as monitoring, analysis and assessment of the situation.

It is naive to think that a single municipal structure has the capacity and is able to cope on its own with the challenges posed by climate change in the community and specific disasters such as fires, storms and floods in particular.

The main causes of forest and urban fires have been identified and analyzed. The influence of individual factors on the degree of risk of forest fires has been identified.

The weather, atmospheric conditions and the influence of the physical and meteorological factors involved in forest fires are decisive for limiting and eliminating the fire in a given area.

Characteristic of forest fires is that the fire front often changes direction due to wind and turbulent air currents in case of fire, their rapid growth in large areas with vortices and sparks over long distances and the formation of new fires, which creates a real danger for the lives of firefighting teams and animals and their habitats .

The experience we have has shown that the fight against fires must begin long before they occur.

It is estimated that the prevention of the risk of urban and forest fires is carried out not only by taking the necessary precautions on site and time, but by effective use of modern technologies at every stage of the fire process. Geographic fire management information systems provide an opportunity to address existing shortcomings in fire risk prevention plans. The preparation of forest fire risk maps ensures the identification of risk areas and the taking of timely measures to protect personnel. Fire risk maps are created in order to provide the necessary data for the selection of methods for solving problems.

The ideal case is to recalculate the drought coefficient, which is a nonlinear function of precipitation over the last 40 days. Drought is then combined with an exponential function that takes

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

into account actual or projected weather conditions (temperature, wind, relative humidity and precipitation).

This is how the fire hazard index is obtained. The development of mesh meteorological models combined with fire propagation and burn rate models will provide preliminary and promising predictability for fire or fire spread.

Determining the level of preparedness to meet the identified risks is directly related to the analysis of meteorological data and short-term weather forecasts, as well as the results of observations and relevant scenarios developed by fire distribution models that reach operational centers. This information is essential and absolutely necessary, together with data from existing surveillance, early warning and alert systems.

The operational duty officers who monitor the information on the meteorological and fire situation do not have the time and the necessary knowledge of meteorology and cannot read the maps correctly, as well as make reasonable proposals for the development of meteorological anomalies and related fire spread. Almost nowhere are automatic (and not only) forecasts for the development and change of weather in a specific potentially significant for dangerous weather region offered. Simulation models are not used and different fire development scenarios are not played automatically. For the time being, no real-time visualization of forest fire behavior and data-driven simulation services are available.

Based on the analyzes made for the municipality of Dupnitsa in the mentioned material, interviews and discussions, it can be suggested:

1. It is easy and accessible for all responsible persons from the municipality - the operational duty officers and all interested services, as well as the citizens to be informed about the state of the dangerous weather, threatening the whole public life in the region.

2. Providing additional more detailed and specialized information on "Internet" sites.

3. Obtaining results from measurements from the deployed network of automatic stations in the country, working in the "Internet" environment. Use of American models for Europe - GFS and MRF, with regional models for the Balkans WRF, EURO 4 and with the 72 hour models of OFFENBACH (Germany).

4. Execution of requests to a specified internet address, sending regular text forecasts for the next 72 hours, as well as for dangerous weather over the next five days (expected adverse weather events disturbing all public life).

5. Conditions for increasing the concentration of harmful gases / CO2, NO, NO2, fine dust particles, precipitation over 10 l / m2, strong wind over 15 m / s, conditions for fires, ice, snowfall over 15 cm, strong thunderstorms and hail localized for certain areas.

6. According to the given coordinates, a forecast wind is transmitted to the users every 15 minutes, 48 hours ahead, calculated with the influence of the orography / resolution of 1.5, 8 km.

7. Construction of cyber infrastructure for simulation, forecasting and visualization of forest fire behavior in real time and data-driven simulation.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

8. Providing tools for forecasting a more accurate rate of forest fire spread.

9. Development of interfaces for visualization of high-density sensor networks to improve fire and weather forecasts, and create a data model for forest fire resources, including detected and archived data, sensors, satellites, cameras, modeling tools, working streams and social information, including feeds in You tube , Twitter , etc. for research and reaction to forest fires.

10. In the presence of an information LED display on request, short regular text messages for dangerous weather are sent every 3 hours a day. It is managed mobile with GPRS communications. In the absence of such a display, it is delivered, installed and maintained on an LED screen for weather forecasts. This service is particularly useful because it does not involve operational staff from the organization concerned to monitor and enter this information.

11. Delivery, installation and operational support of specialized meteorological stations , with mobile connection and receiving information on the Internet and smartphones and via SMS messages. Mobile management with GPRS communications.

12. Integration of systems for obtaining meteorological data , information, forecasts and notification of dangerous weather with the systems for monitoring river levels and flood dangers.

13. construction of fire towers not only in the forests, but also in selected urban areas.

14. Carry out mapping with annual updating of the most fire-hazardous areas with attributive information about them, roads for access to them, emergency routes and response capacity of professional and voluntary teams.

15. providing funds for the construction of public address systems, both in municipal and state institutions, and to promote and insist on a legal obligation to install smoke alarms and fire alarm systems in private homes.

16. Increasing the responsibility of citizens as observers and implementing modern applications and software for communication between citizens and municipal services.

17. Mapping the risk of forest fires based on GIS applications.

18. The expediency of the training of the personnel with modern information technologies on risk management is substantiated, which envisages the application of technical solutions for prevention of forest fires.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

13. APPENDICES

A. Definitions and definitions of basic concepts

The definitions and definitions of the basic concepts set out in this document are based on:

Disaster Protection Act [1];

Report of the open ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction , United Nations General Assemblyq 1.12.2016 [1.1];

ISDR, Terminology : Basic terms of disaster risk reduction [1.2]

Handbook on Reducing Spatial Risks in European Regions and Municipalities MISRaR

Glossary of terms and definitions in risk science. Center for Disaster Management and Risk Reductionq , Karlruhe Germany , Alliance for the Environment, Sofia Bulgaria, AURE - ECOREGIONS, Sofia, Bulgaria

Experimental Dictionary of Flood Risk Management. Common terms and theirs Interpretation , State Agency for Information Technology and Communications, Environmental Alliance, Sofia

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Bulgaria, AURE - ECOREGIONS, Sofia, Bulgaria, Center for Application of Satellite Images RESAC.

The use of curly braces {}, point to additional explanations of this concept.

Disadvantaged groups or persons and / or vulnerable persons and groups . Individuals or groups in the area of influence of the Project that could experience the adverse effects of the proposed Project more severely than other persons and groups due to their vulnerable or disadvantaged position. This situation may be based on race, color, sex, language, religion, political or other beliefs, national or social origin, property status, birth or any other characteristic of a person or group. In addition, other factors such as gender, ethnicity, culture, illness, physical or mental disability, poverty or economic disadvantage, and dependence on unique natural resources must be taken into account. Dangerous waste.

Wastes whose composition, quantity and properties pose a risk to human health and the environment have one or more properties that identify them as hazardous and / or contain components that make them hazardous and / or are identified as such under the Basel Convention to control the transboundary movement of hazardous wastes and their disposal.

"Natural phenomena" are phenomena of geological, hydrometeorological and biological origin, such as earthquakes, floods, mass movements (landslides, mudslides, avalanches), storms, hail, heavy snowfalls, frosts, droughts, forest fires, mass diseases of epidemic and epizootic nature, pest infestations and the like caused by natural forces.

"Incident" means unpredictable or difficult to predict , limited in time and space action, with high intensity of forces or as a result of human activity, endangering the life or health of people, property or the environment.

"Accident" is a large-scale incident involving roads, highways and air traffic, fire, destruction of hydraulic facilities, accidents caused by offshore activities, nuclear incidents and other environmental and industrial accidents caused by human activities or actions.

"Industrial accident" is a sudden technological damage to machinery, equipment and units or the performance of activities with hazardous substances and materials in the production, processing, use, storage, loading, transport or sale, when it endangers human life or health, animals, property or the environment.

"Danger" means a dangerous phenomenon, substance, human activity or condition that can cause loss of life, trauma or other health consequences, property damage, loss of livelihoods and services, social and economic disturbances or damage to the environment.

"Risk" {1} The likelihood of adverse effects or expected losses (deaths, injuries, property, livelihoods, economic disruption or damage to the environment) as a result of interactions between natural or man-made hazards and vulnerable conditions.

"Vulnerability" {2} is the characteristics and condition of a community, system or asset that make it vulnerable to harmful hazards.

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

"Disaster risk" means the potential disaster losses that may occur to a community, including life, health status, livelihoods, assets and services, over a period of time.

"Risk analysis and assessment" is the determination of the nature and extent of risk as a function of hazard, vulnerability and probability. In some cases, the risks are classified according to the danger and vulnerability, in others - according to the probability and impact. The hazard and vulnerability approach is particularly useful for disaster analysis (a risky approach), as one cannot have an impact on hazards such as earthquakes, volcanoes and extreme weather conditions. For these risks, it is particularly important to focus on the appropriate analysis of vulnerabilities (people, economy, environment), as they are the only ways to reduce the risk. The probability-impact approach is suitable for the simultaneous analysis of different types of risk, because it allows to present the results through diagrams. This approach is also called the "very risky approach".

"Disaster risk reduction" means the identification, analysis and assessment of disaster risk and the implementation of measures to eliminate or reduce it.

"Disaster management" is a process of coordinating the efforts of the various structures of the unified rescue system and their joint work to achieve the common goal - disaster management and protection of life and health of people, property and the environment.

"Risk mitigation" means an action to reduce the likelihood and / or impact of a disaster and / or the vulnerability of society. The concept includes all forms of risk reduction, mitigation and mitigation for the various elements of the concept of risk and harm. Preparatory measures for specific risks (expectations), such as spatial planning to provide access to emergency services or evacuation options, can be interpreted as preventive or vulnerability reduction measures.

"Risk identification" Risk identification is defined as "the process of identifying, identifying and describing existing or potential risk situations." Risk identification requires the simultaneous identification of the causes (sources of risk) and the victims (vulnerable).

"Risk mapping" A tool for creating an interconnection between risk management and spatial planning. The combination of localized sources of risk, vulnerability and disaster relief potential make an area more or less preferred for spatial development.

"Exposure and vulnerability" To assess the impact of the hazard, the first step is to analyze and reconstruct the environment that may be affected. In general, exposure data identify the different types of physical objects that are on the ground, including built assets, infrastructure, agricultural land and people. The characteristics to be assessed depend on the scope of the analysis. If the risk is assessed in terms of losses in the built-up environment, structural types and construction characteristics are required. If the risk assessment includes damage to agricultural land, the types of crops and their seasonality must be taken into account. Mortality risk analysis will require demographic and socio-economic characteristics of the population.

"Mitigation " - Reducing or minimizing the adverse effects of a dangerous event.

"Economic loss" - Total economic impact, which consists of direct and indirect economic losses. Direct economic losses : the monetary value of the total or partial destruction of physical assets existing in the affected area. Direct economic losses are almost equivalent to physical damage. Indirect

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

economic losses : decline in economic value added as a result of direct economic losses and / or impacts on humans and the environment.

"National Disaster Risk Reduction Platform" - A general term for national coordination mechanisms and policy guidelines for disaster risk reduction that are multisectoral and interdisciplinary in nature, involving public, private and civil society involving all stakeholders in a country.

"Critical infrastructure" is a system or parts of it that are essential for the maintenance of vital public functions, health, safety, security, economic or social well-being of the population and whose violation or destruction would have significant negative consequences for the Republic of Bulgaria as a result the inability to preserve these features.

An "early warning system" is a set of necessary methods and systems for creating and disseminating timely and meaningful warning information, enabling people, communities and organizations at risk to prepare and act appropriately in order to reduce possible harm. or losses.

Hazardous meteorological phenomena : - Refers to all meteorological phenomena that have the potential to cause damage, serious social disruption or loss of life. According to the World Meteorological Organization's (WMO) definition of hazardous phenomena, such are all atmospheric conditions that are potentially destructive or hazardous to humans.

Heat wave: Significant warming of the air, often accompanied by the intrusion of very warm air over a large area. It usually lasts from a few days to a few weeks.

Fire:

Fire is a combustion that spreads uncontrollably in time and space, characterized by the release of heat, accompanied by smoke or flames, or both (BDS ISO 8421 -1).

Drought : Prolonged rainless period with accompanying fever, decreased humidity, increased evapotranspiration and evaporation; deficiency of soil moisture with the manifestation of dry root zone and disturbed water balance in the soil, affecting the development of plants and their yields and conditions for the development of organisms in the soil; clear reduction of water resources - surface and underground runoff, reduced nutrition of dams, reservoirs and wetlands with accompanying impacts on nature, ecosystems and people; direct impact of water scarcity on water supply, water consumption , irrigation, water transport, electricity generation, etc.

The standardized outflow index SRI is a hydrological index used to determine the presence and degree of drought in a particular river basin.

Intensity of seismic earth movement: Generalizing concept for characterization of earth movement at a given point. It can be represented by the acceleration, the velocity of the soil particles, the amplitudes of the displacement, the microseismic intensity (degree) or the spectral intensity.

General risk assessment in case of disasters and accidents. Priority assessments. Each hazard includes all factors so that a comparison can be made and prioritized between all identified hazards that may have the potential for disaster. The risk analysis focuses on calculating the relative risk

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

priorities of a hazardous event, using a simplified risk prioritization model to calculate the relative disaster risk priorities to which communities in a given area are exposed.

B. Additions and clarifications

Multi-layer safety

A relatively new concept (source: https://thewaterchannel.tv/articles/ccc-dikes/) relating to the EU in various cases - cybersecurity , natural disasters and others.

The idea of the concept is that in addition to taking preventive measures, it is important to achieve a minimum of disaster consequences.

The main and most important part is focused on prevention (layer 1). This layer includes all measures necessary to prevent disasters. As there is always little chance of preventive measures that are not needed, it is important to minimize the impact of disasters (fires) at an early stage by land use planning (Layer 2). In order to be able to use this layer, it is important to act adequately when crisis management is needed (layer 3).

{1} Risk

The different definitions of " risk " have the same meaning. They only add elements to the concept of risk. The two main definitions are:

Risk = (probability) x (impact)

Risk = (danger) x (vulnerability)

It is important to distinguish between the English terms risk and hazard , which in some languages are translated by the same word.

If the second definition is taken into account, the difference between risk and danger is in the vulnerability of the victims: the potential danger includes only the (probable) negative effect of an incident (disaster or crisis). The degree of vulnerability of people and the environment to such an effect determines whether the risk is significant. For example: a flood in itself can be considered a danger. However, if it occurs in an uninhabited area, without economic and environmental value, then we say that there is no or little risk.

Risk can be defined as the possibility or probability of a specific event causing losses to be suffered by a system of elements as a result of a given level of threat . Elements of risk are populations, communities, the environment, economic activities and services that are at risk of disaster in an area.

{2} Vulnerability

Vulnerability is a composite concept that includes exposure and susceptibility. For example, the degree to which buildings are vulnerable to floods depends on both the degree of exposure (what is

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

the height of the water?) And the degree to which the buildings are really affected by water (of what material and how strong are they built?) .

The difference between the two definitions is in the grouping of concepts. Combining these concepts creates the following complex definition:

The formulas are intended to indicate that risk is a concept consisting of different components, but the results should not simply be multiplied. This would lead political or administrative leaders to come to the unjustified conclusion that probability and impact should, by definition, be taken into account equally. It is important that in the risk assessment, both the probability and the impact are analyzed and assessed separately.

Each part of the risk concept is needed to identify risk mitigation measures. An additional reason for the separate analysis of the different components of the concept of risk is that each of them can lead to different types of protection measures. A risk can be reduced by overcoming the elements of occurrence, main effect, exposure and susceptibility. For each type of disaster or crisis, it is appropriate to consider which are the most defining elements of risk and where the greatest opportunities to reduce it.

{3} Exposition

Exposure data should include the physical location of the asset, as well as the characteristics of the asset that affect its vulnerability and allow the assessment of damage or loss to the asset. These characteristics may usually include:

- geographical location of each exhibited element;

- structural characteristics;

- substitution values;

- human occupation / population density / number of people in each place, and socio-economic characteristics of the population in each place

{4} Mitigation

Adverse effects of hazards, in particular natural hazards, often cannot be completely prevented, but their scale or severity can be significantly reduced through various strategies and actions. Mitigation measures include engineering techniques and hazardous structures, as well as improved environmental and social policies and public awareness. It should be noted that climate change policy defines "mitigation" differently and is the term used to reduce greenhouse gas emissions, which are a source of climate change.

{5} Asset losses

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.

Examples of physical assets that are the basis for calculating direct economic losses include homes, schools, hospitals, commercial and government buildings, transportation, energy, telecommunications infrastructures and other infrastructure; business assets and industrial enterprises; and production such as crops, livestock and production infrastructure. They may also include environmental assets and cultural heritage.

{6} National Disaster Risk Reduction Platform.

Effective government coordination platforms consist of relevant stakeholders at national and local level and have a designated national coordinator. In order for such mechanisms to have a solid basis in national institutional frameworks, additional key elements and responsibilities should be identified through laws, regulations, standards and procedures, including: clearly defined responsibilities and powers; building disaster risk awareness and knowledge by sharing and disseminating insensitive disaster risk information and data; contributing to and coordinating local and national disaster risk reports; coordinating campaigns to raise public awareness of disaster risk; facilitating and supporting local multisectoral cooperation (eg between local authorities); and contributing to the definition and reporting of national and local disaster risk management plans and all disaster risk management policies.

{7} Exposure data

Exposure data should be systematically collected and updated. Demographic and socio-economic data with geographical references - population, age groups, income levels, etc. - are usually collected by census. Censuses of buildings, including structural features of buildings and infrastructure, are less common. Exposure data should include georeferenced locations of buildings and infrastructure, structural features, surrogate values or features related to the reconstruction, such as building use. These data are essential for quantifying losses and prioritizing interventions. Given the potential sensitivity of such data, they may be collected by government institutions to make available to risk modeling professionals.

Historical risk data are essential to assess the risks of future losses. For many hazards, such data are not collected systematically, are cataloged in various formats, are inaccessible and lack metadata. Recording the magnitude, location, duration and timing of each hazard or extreme event is a key component in the process of documenting and cataloging damage and loss. Accumulated over time, these data provide a basis for calibrating and validating the hazard models needed for probabilistic risk assessment .

The project is co-financed by the EU through Interreg -IPA CBC Republic of Bulgaria - Republic Northern Macedonia CCI № 2014TC16I5CB006 ..
This publication has been produced with the assistance of the European Union through the Interreg IPA CBC Program Republic of Bulgaria - Republic of Northern Macedonia CCI № 2014TC16I5CB006.
The contents of this publication are the sole responsibility of the TWELFTH TABLE Foundation - Bulgaria and can in no way be taken to reflect the views of the European Union or the Managing Authority of the program.