The devastating impact of forest fires encouraged a strong reaction in the public after Pančić's spruce was endangered with their spread. Analyzing the impact of climate change on fires, Dr. Dejan Stojanović, senior research associate at the Institute of Lowland Forestry and Environment, University of Novi Sad and our author, Milica Simonović, write about the future of this threat in Serbia.

Compared to the horrific scenes of fires engulfing dense forests on the Greek island of Evia and the fact that the situation with fires in Greece is so alarming that other countries had to send help in extinguishing fires, fires that occur in Serbia do not work that way extreme. This is true for now, however, thanks to global warming, the situation could change so much in the future that there is a possibility that we will see scenes similar to those in Greece in our area.

Already this summer, forests in Serbia were burning more noticeably than usual, as well as in Montenegro, Bosnia and Herzegovina, Romania, Bulgaria and all countries in the region, while in the mentioned fires in Greece, but also in Italy and Turkey, human lives were lost. The Mediterranean and the region of southern Europe, to which the Republic of Serbia belongs in a broader sense, is one of the most endangered regions in terms of the impact of climate change and the consequent damage that affects it, which is expected to be more intense and frequent.

The consequences of forest fires are numerous, they lead to loss of biodiversity, disrupt transport and utility infrastructure, disrupt communications, emit large amounts of greenhouse gases, lead to deterioration of air quality by releasing large amounts of small PM particles into the atmosphere, loss of property, various resources. animals and the loss of human lives. Air pollution can result in a number of health problems, including respiratory and cardiovascular problems. A very significant health effect of fire is the impact on the mental health and psycho-social well-being of people in the affected areas.

Forests of Serbia under the pressure of climate change

Based on the data of the Republic Bureau of Statistics, in 2020, 26 fires were recorded in state forests in Serbia with a damaged wood volume of 3,525 m3, which is less than 3 percent of the total damage in forests during that year. Fire damage in certain years was the more dominant cause of annual losses in forestry with tens of thousands of m3 of destroyed wood (2003, 2011, 2012 and 2016). If we talk about the years in which over a thousand hectares of forests burned, those are 2003, 2007, 2009, 2011, 2012 and 2017. For now, fires have not shown their great potential in Serbia, but they represent a risk that could lead to greater damage in the future and social problems.

If we compare Serbia with Portugal and Greece, which all in a broader sense belong to the Mediterranean region and which are of comparable size and comparable number of inhabitants, in Serbia the number of forest fires, burned areas and consequently damage is up to two orders of magnitude smaller. However, in the period from 1961 to 1990, Greece had an average annual temperature of 15.7 ° C, Portugal 15.15 ° C, and Serbia 10.55 ° C. More extreme climate scenarios suggest that Serbia could reach temperatures close to those prevailing in Greece and Portugal by the end of the 21st century, where fires are one of the biggest social and economic problems. In the past 13 years, Portugal and Spain had the largest areas affected by fires in Europe, while in 2021, Greece and Italy are in the lead.

Climate change leads to more intense and frequent heat waves, as well as more frequent droughts, and dry and warm weather, along with dry vegetation, create conditions for easier outbreaks and spread of fires.

Insight into the European Forest Fire Information System (EFFIS), which provides real-time insight into the state of forest fires, based on satellite images, and also offers risk maps, shows the presence of fires in the entire region during July and August 2021. There may be fewer fires in Serbia than in the region, however, the risk map based on the FWI (Fire Weather Index) index for August 17 speaks in favor of the high meteorological risk (extreme danger) of fire outbreaks in Serbia. This risk is higher than in Bosnia and Herzegovina, Croatia, Hungary, Romania and Bulgaria.

If we talk about fires in Serbia in the past twenty years, 2007 was the year with the most burned areas (about 22 thousand hectares) based on data from the Bureau of Statistics. Based on data from the EFFIS database, in the period from 2008 to 2020, Serbia had an average of about 4,200 hectares of burned areas per year, while until August 17, 2021, that area was close to 4,000 hectares. Given the high meteorological risk, there is a real danger that by the end of 2021 there will be more serious large-scale fires in our area.

Fires are not the only problem

When during a number of years, from 2003 to 2020, the total damage in the forests of the Republic of Serbia is observed, regardless of whether the fire damage was the dominant cause of annual losses or not, there is a trend of increasing annual damage, so the value of damage between 2003 and 2013 ranged from about 30,000 to about 85,000 m3 of wood, while from 2014 to 2020 this value was between about 113,000 and about 223,000 m3. Although fires in Serbia represent one of the biggest long-term risks for the sustainability of forest management, but also for biodiversity, ie through other ecosystem services, they are not the biggest problem that forests in Serbia face. The last 20-30 years have clearly seen a

decline in the vitality of certain forests, mainly in the lower parts of our country, precisely due to the consequences of climate change, such as droughts and water shortages.
When the vitality of forests declines, trees are more easily attacked by pests and diseases, and in addition to them, drying of forests, windbreaks, icebreakers and illegal logging also cause damage. The trend of annual damage growth is not threatening for now, but it is alarming, since it is expected to strengthen in the future.

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Climate change and forest fires

Recently, the US National Oceanic and Atmospheric Agency (NOAA) announced that, globally, July 2021 took the title of the warmest month ever, since measurements were made, while in Serbia this July is the second warmest July for the period between 1951 and 2021. According to the data of the Republic Hydrometeorological Institute of Serbia.
The clear trend of global warming is reflected in the fact that the last seven years are among the seven warmest years, while the ten warmest years are recorded in the past fifteen, taking into account all modern measurements that began worldwide 140 years ago. Anthropogenic greenhouse gas emissions have made the last 44 years in a row warmer than the average annual temperature in the twentieth century.
Climate change leads to more intense and more frequent heat waves, as well as to more frequent droughts, and dry and warm weather, along with dry vegetation, create conditions for easier outbreaks and spread of fires. Climate change has also led to the fire season in many regions of the world lasting longer than before, which further increases the risk of major disasters, which have been on the rise in recent years. Although man is responsible for starting fires in most cases, multi-year dry periods are the main precondition for forest fires.

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Adaptation measures

Since it is almost certain that we can expect more frequent and intense climate extremes in the future, which, among other things, contribute to more extreme forest fires, preparation for dealing with the consequences of climate change and adaptation to new conditions will be necessary.

Specifically, in the case of forest fires, adaptation measures include, above all, strengthening and raising awareness among people about the risks of fires, as well as fire prevention through adaptive forest management, ie. application of a series of measures in forestry in order to better adapt to climate change. Measures are also the promotion of mixed forests and nature-close management, which includes approaches that disrupt the functioning of existing forest ecosystems as little as possible, in habitats where possible. One of the measures is the thinning of coniferous crops, since the risk of fire outbreak, ie its spread, is greatest in coniferous forests that are not properly managed. The construction of fire-fighting railways and new forest roads, strengthening the capacity for extinguishing fires, but also subsidizing forestry in a way that stimulates the protective function of forests are also important.
Source: Klima 101