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Full version – Translated from Greek

Extreme intimidation

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We design stormwater networks for a return period of 5 to 10 years. This means that in the very favourable (and not very frequent) case that, where we live, there is a well-maintained rainwater network (with regular cleaning of inlets, etc.), we will see the street in front of our house flooded every 5 to 10 years on average.

The flood protection works for urban streams are designed for a return period of 50 years. If we now consider that in Greece there are more than 500 settlements with streams vulnerable to flooding, and even if they have properly constructed anti-flood works, this means that on average we will have at least 10 cases of overflows and flood disasters in the country every year. And every two years we will record an extreme thousand-year flood event somewhere in Greece.

This is how the legal standards of our country define. One might say, why do we not raise the thresholds to reduce the frequency of disasters? The answer is simple. Flood protection works are expensive, there is no money.

Therefore, the floods and the disasters they cause, were, are and will be present. Has anything changed today compared to before?

Yes, it has changed. “Where pennyroyal and wild mint used to grow”, we now have paved roads and buildings. Rainwater does not filter into the soil, the volume of water flowing is greater, runoff rates are more intense.

Yes, more has changed. People used to be in harmony with nature and knew how to manage the difficulties caused by natural phenomena. For example, they did not build on or next to stream beds. In the mountain village where I grew up, a meter of snowfall was not uncommon. Our parents cleared the paths from snow so that children be able to go to school. The school didn't close when it snowed or rained. Cause society considered it natural to rain and snow and knew what to do.

In other words, we have negative developments, but there are also positive developments related to technology. Thanks to it, we have not only averted much suffering, but we have dramatically improved the harshest of indicators, the human victims of natural disasters. Worldwide, in the 1920s, per million inhabitants, we had over 2500 deaths from droughts; and in the 1930s almost 2000 deaths from floods. In the 2010s the corresponding figures are 3 and 7 deaths per million. A 300- to 900-fold reduction—even though the media trumpets ever-deteriorating conditions.

Do we have any progress in Greece, too? Yes, of course, on the technical side. We have built several flood protection projects. We have flood risk management plans coordinated by the Directorate for the Protection and Management of the Aquatic Environment (former Special Secretariat for Water). We have flood risk maps. We have processed the historical records of measurement. For example, we have singled out 238 rainfall stations with annual maximum daily rainfall data for 60 years or more. There are many more, but only those with long observations are appropriate for climate analyses[1].

The scientific method requires comparisons of older with newer conditions to be made between similar indicators and not at will. The most characteristic indicator, supported by the abovementioned 238 time series of measurements, is the maximum daily rainfall amount, the measurement of which, according to the usual convention, is taken at 8:00 on a given day and includes the total rainfall from 8:00 of the previous day.

Based on these 238 time series, the record 24-hour rainfall in the country occurred in Makrinitsa in 1957 and was 580 mm. Of the 238 time series, the one with the longest length (157 years) is that of the Hill of the Nymphs in Athens, where the record occurred in the hydrological year 1899-1900 and was 150 mm. Over the next 123 years, it wasn't exceeded—not even in the recent episode that rained 85 mm. It is most likely that the record of 580 mm was not exceeded in Makrinitsa either. Unfortunately, we do not have the full measurement: due to overflow of the rain gauge we only know that it was over 100 mm. NASA's IMERG satellite data give the maximum daily rainfall in Makrinitsa not to exceed 250 mm (and in the wider area to exceed it slightly). This value was obtained by the above-mentioned standard convention for daily rainfall depth and after converting the surface satellite rainfall depth to point rainfall. It should be noted, however, that satellite data are not as accurate as ground data and some underestimation of rainfall amounts cannot be ruled out.

In any case, we had an extremely extreme rainfall episode, but within the framework of stochastic forecasts for extreme rainfall. Specifically, according to this year's revision of flood risk management plans, the thousand-year daily rainfall we expect in the eastern Pelion region (one of those with most intense rainfall in Greece) is 810 mm—and we certainly didn't come close to that.

But, as we said, extreme events, such as the recent one, have been happening and will happen. Some are fast to blame it on climate change, intimidating the population with the threat that they will become more intense. They may be unaware that climate change, which, they say, “is here”, has indeed “been here” throughout Earth's 4.5 billion years of history. Or maybe they're looking for scapegoats—and, as we know, the climate crisis and Putin are the most appropriate.

Those who talk about the climate crisis do not serve scientific truth and ethics—since the climate crisis is not a physical event (and as such, an object of science), but a political one. Nor do they serve the social and national interest. Nor do they suggest anything that would help sufferers, or protect the country against extreme events. Objectively, unknowingly or deliberately, they offer their services to the interests that promote the international political agenda of climate crisis.

[1] Results of detailed analyses of climate trends have recently been published in the paper: «**In search of climate crisis in Greece using hydrological data: 404 Not Found**» (D. Koutsoyiannis, T. Iliopoulou, A. Koukouvinos, N. Malamos, N. Mamassis, P. Dimitriadis, N Tepetidis, and D. Markantonis, *Water*, 15 (9), 1711, http://dx.doi.org/10.3390/w15091711, 2023).