DATI ALLA MANO
I PODCAST

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WHAT HAPPENED TO THE CLIMATE?

Landslides, floods, burning cities in summer, disappearing glaciers...it's not easy to say that climate is not changing, but what exactly is happening and why?
I am Cristiana Conti and this is Dati alla mano (Data at Hand), a podcast by Istat, the Italian National Institute of Statistics, where I work in the Directorate for Communication, Information, and Services to Citizens and Users. This initiative is part of a public communication project.

In this episode, we will talk about greenhouse gas emissions, hydrogeological risks, and how much temperatures have changed in our cities.

Let's take a look back: among the 17 SDGs, that is, the sustainable development goals signed in 2015 by the United Nations and to be achieved by 2030, there is one - Goal 13 - which states as follows: take urgent action to combat climate change and its impacts. This means that at a global scientific level there is an awareness that the climate is changing and that something needs to be done to protect the liveability of the planet. And something needs to be done, all together. The direction must be shared worldwide because the consequences of each country's behaviour also affect others. But in Italy, how do we measure these phenomena and what do the data tell us? I asked Giovanna Tagliacozzo, a researcher who has been working on this subject for years.

Cristiana. Welcome Giovanna.
Giovanna. Thank you, greetings to our listeners.
C. Tell me, how do we monitor SDG Goal 13, the one on combating climate change?
G. Obviously, at Istat, we monitor all goals. For Goal 13, we have 19 indicators, also thanks to the collaboration with Ispra, the Italian Higher Institute for Environmental Protection and Research. These measures range from the quantity of greenhouse gas emissions produced, but also – for example – the proportion of the population exposed to hydrogeological risks, the impacts of forest fires, and the public's concern about climate change and greenhouse gases.
C. And what is the trend? Is there any good news?
G. Well then, the good news is that greenhouse gas emissions in Italy are decreasing – and have been decreasing in several countries for many years, in particular thanks to the commitments made with the Paris Agreement in 2015 and even earlier with the KYOTO Protocol, back in 1997. But more needs to be done.
An important aspect is how the gap between greenhouse gas emissions and GDP has been widening over the years…
C. This means: that it is possible to grow the country's wealth and at the same time protect our climate. Right?
G. Correct. The so-called decoupling, or the disjunction between the dynamics of emissions from productive activities and GDP, demonstrates that it is possible to ensure economic growth while

containing emissions, thanks to greater system efficiency and conversion to renewable energies. This is what the data tells us and it is being observed in several countries.
C. But emission levels during the pandemic period were lower, if I remember correctly.
G. Yes, that's right. In Italy, per capita greenhouse gas emissions in 2020 had fallen to 6.5 tonnes due to the temporary closure of some economic activities during the lockdown phase. But already the following year they were back to 7.1 tonnes per inhabitant. If activities stop, it is clear that emissions decrease. The challenge is to make them decrease again even when activities are at full capacity, and in fact in 2023 we were back to 6.8 tonnes.
C. Not many, but fewer than the previous year.
G. Indeed. And consider that the sector of the manufacturing industry, which accounts for more than a fifth of total emissions, reduced its emissions by 3.8% in 2023.
C. Other top performers?
G. The electricity supply industry reduced them by more than 20%.
C. Excellent, how did they do it?
G. Partly due to the overall reduction in activities, but also due to less use of fossil fuels for energy generation and a greater reliance on renewable sources.
C. But just how crucial is to reduce these emissions?
G. It is important, because the increase in greenhouse gas concentrations in the atmosphere is the cause of rising temperatures; limiting global warming as much as possible, even by a small fraction of a degree, matters! Among the other, Italy, as well as the entire Mediterranean area, is considered a climate change hotspot.
C. What does that mean?
G. It means that the effects of climate change are felt in this area more than elsewhere. Consider that in 2023 compared to the 1991-2020 thirty-year average, the temperature has risen by 0.86 degrees Celsius globally, while in Italy it has risen by 1.14 degrees.
C. Good heavens!!! And if it keeps rising, what happens to us?
G. There are several consequences, for example, the increase in temperatures also leads to the increase in extreme rainfall events. It should be noted that our country is already very fragile from a hydrogeological point of view, and we have recently seen the tragic consequences of floods and landslides...In 2024, 5.7 million people live in landslide-risk areas, and for more than 1.2 million the risk is high or very high.
On the other hand, many territories are at risk of drought and desertification, and in this case, there are severe consequences for many productive sectors. Just think aboutagriculture, for example. Therefore, it is also about protecting economic activities and jobs!
C. Are we alarmists?
G. We are pragmatists. The watchwords are mitigation and adaptation. This means that on the one hand we must work to reduce emissions, also keeping in mind that developed countries have a historical responsibility; and at the same time we must adapt to the changes that have already occurred, supporting the most vulnerable countries that are suffering the consequences the most. This is about protecting our safety, saving human lives – just think about the deaths caused by intense heatwaves – and also protecting our health from different kinds of pollution, as well as our lifestyles, our assets, infrastructure, and our productive activities.

To quote the words of Antonio Guterrez, the Secretary-General of the United Nations, 'the failure to limit global warming to 1.5 degrees Celsius is a moral failing and a deadly negligence'.
C. So, do we need to acknowledge the risks and try to address them?
G. Yes, and we need to do it urgently and with the support of science. There is still a great deal that can and must be done. The Conference of the Parties, the COP, as we have seen, despite all its contradictions, is still **THE** place dedicated to discussions and it must continue to be such a dedicated place, because it is right there that countries have made - and continue, and must continue - to make commitments on mitigation and adaptation. COP30 has just concluded, we know that much more should be done, but these are controversial issues with strong economic interests, and we must be realistic, indeed!
C. All clear. Thank you, Giovanna, and see you next time.
G. Goodbye!

So far, we have talked about climate change in general. But in detail, shall we also look at what is happening in our cities? I asked another expert on the subject: Donatella Vignani, a senior researcher at Istat who has been working for years on the production of statistical indicators on Weather and Climate, Extreme Events, and Climate Change.
Cristiana. Hello Donatella.
Donatella. Hello Cristiana, greetings to the listeners.
C. Can you tell us something about the climate in our cities? Is it changing? And if so, how?
D. Look, we have just published a time series that shows different indicators on weather-climate events of precipitation and temperature from 2006 to 2023 for the 109 provincial capitals. Urban areas are considered among the *hot spot* of climate change, meaning areas where warming is occurring with an intensity and speed higher than the global average.
C. So these data can give us a good perspective on what has happened.
D. Exactly.
C. Tell us more.
D. From what do you want I start from?
C. From temperatures, I'd say, since we've talked about progressive global warming.
D. Well, I can tell you straight away that 2023 was one of the warmest years recorded since 1971. The average annual temperature of the 109 provincial capitals combined was 1 degree Celsius higher than the average for the decade 2006-2015.
C. Was there an increase in all the cities taken into account?
D. In 97 out of 109 provincial capitals, with some peaks…
C. Where?
D. In Cremona, where there was an increase of 2.4 degrees, in Bologna of 2.3, and in Sondrio of 2.1.
C. Any other evidence?
D. If we consider the regional capitals, instead of the provincial ones, it is also possible to make another comparison of the annual data with the so-called Climatological Normal 1981-2010, to calculate climatic anomalies.
C. What is that?

D. The Climatological Normal represents a 30-year climatological reference period, in our case, the one from 1981 to 2010.
C. And what does this comparison tell us?
D. …that in all 21 regional capital cities, in 2023, there was an increase in the average temperature compared to climatological values. On average, the increase was 1.7 degrees, a significant anomaly.
C. Do we also have any peaks to report in this case?
D. Yes, Perugia with an increase of 3 degrees compared to the Climatological Normal, Bologna recording 2.6 degrees more, followed by Milan where the increase reached 2.4 degrees. As I mentioned, for regional capitals, we have more extensive time series available that allow us to observe over the long term.
Since 1971, the average temperature has shown a progressive increase, with the warmest years of the last decade.
C. Listen, a little while ago Giovanna and I were talking about drought risk … what can you tell me about that?
D. In 2023, we recorded a decrease in precipitation in 71 of the 109 Italian provincial capitals, in terms of millimetres of rainfall. Furthermore, over the last fifteen years, precipitation variability has increased, with an alternation between more rainy years and less rainy years.
C. Still with respect to the 2006-2015 period?
D. Yes. The lowest annual rainfall is recorded for the provincial capitals located in the Islands - approximately 441 mm, which is a value well below the average for 2006-2015. At the same time, however, if we still think about precipitation, the number of days with intense rainfall is increasing.
C. Ah, those are what we commonly call cloudbursts and violent storms, events linked to the warming climate. And what can you tell us about our endless summers?
D. Thinking back to the Regional Capitals, the number of summer days has increased: in 2023 there were on average 28 more compared to the thirty-year period 1981-2010. For 'summer days' this refers to those where the maximum temperature exceeds 25 degrees Celsius, classified as extreme events.
C. Goodness, 28 more summer days are really a lot.
D. Yes, that is a lot and this is the average value calculated among the Regional Capitals, if we then go into detail, in Perugia, for example, there were 48 more summer days, while in Venice and Trieste there were 43 more.
C. Endless summers…
D. And tropical nights have also increased, in 2023 there were on average 22 more.
C. What do you mean by 'tropical nights'?
D. Nights with a temperature that never drops below 20 degrees Celsius, these are also extreme events.
C. So, these are the nights that sleeping properly is not very easy.
D. Yes, for example, in 2023, Naples recorded 37 more of these nights if compared to the thirty-year period 1981-2010. Tropical nights have adverse effects on human health - disturbed sleep, dehydration, general discomfort. Furthermore, they -can worsen pre-existing conditions, in particular, respiratory and cardiovascular problems.

C. Thank you, Donatella, for giving us these numbers and… for having awakened our awareness.
D. Thank you, Cristiana, and greetings to everyone.

In summary, the numbers tell us a lot about long-term climate change in Italian provincial capitals: temperatures have risen, the number of summer days and tropical nights has increased, precipitation variability has increased, with significant peaks in some cities. However, in Italy, greenhouse gas emissions are decreasing, and this, at least, is good news. Good news that we hope to continue to foster.

I am Cristiana Conti, and this was Dati alla mano (Data at Hand), a podcast from the Italian National Institute of Statistics.
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Are there topics you would like to explore further? Write to me at datiallamano@istat.it

Giovanna Tagliacozzo and Donatella Vignani worked on this episode.