

## Research report

**COMMITTEE :** World Meteorological Organization

**ISSUE :** *Weather data collection : why and how can we involve citizens ?*

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## *How can we provide the general population with secure access to early warning systems for extreme weather events?*

### INTRODUCTION

Hello dear delegates! My name is Emma Chiabrera and I am 16 years old. I am in the Italian section, at the Lycée International de Ferney-Voltaire. I was born in Italy, but I've been living in France for a long time. Personally, I love doing sports, especially dancing and rafting. I've been part of the MUN since last year, and during FerMUN 2022 I was assistant chair at the Security Council. This year we will focus mainly on climate issues. It is essential to find answers to these issues which are becoming more and more urgent and threatening to the environment. Our committee will discuss an issue that looks at the protection of the population from weather threats. The climate has changed dramatically in recent years due to human activity and it is up to us, delegates, to do something about it. I look forward to starting the conference and meeting you in January. Finally, I wish you good luck in finding solutions to protect people from extreme weather events.



### KEY-WORDS

**Early warning system:** a system that warns of approaching dangerous weather conditions ( floods, droughts, heat waves, storms), and explains what governments, the community, and individuals can do to reduce the impact of their effects. These systems monitor weather conditions in real time and forecast weather and climate events. The goal is to understand the risks that affected areas will face, taking into account lessons learned from past events, in order to continuously improve the response.

**Climatology:** long-term study of global or local climate variations. A climate is defined over a period of thirty years at present, but can concern longer times for climates of the past (centuries, millennia, etc.).

**Meteorology:** study of atmospheric parameters at a given time to try to predict short-term variations (a few days).

**Meteorological phenomena:** natural phenomena that happen in the atmosphere and that, depending on their degree of intensity, can have positive or negative effects on ecosystems and, consequently, on human societies.

**Anthropic:** that can be consequent of the presence or action of the human being.



Climate Risk and Early Warning Systems (CREWS) initiative is improving early warning systems to protect the most vulnerable populations against hazards like tropical cyclones and floods in least developed countries and small island developing states.

## OVERVIEW

### 1. What is an extreme weather event?

Among scientists, the notion of extreme weather phenomenon is still debated.

- For **statisticians**, an event is extreme if a measurement (temperature, wind speed, humidity) exceeds the common values. It is the numbers that determine if an event is extreme.
- In **physics**, the extreme event corresponds to a category of events (such as tropical cyclones, extra-tropical storms, heat waves, droughts, etc.) that are of a very high intensity compared to the usual climate of the region in which it happens.
- For **social scientists**, a phenomenon is said to be extreme when it affects society and when society is not used to protecting itself against this particular type of event. An event will be more likely to be qualified as extreme in this case than if it took place in a place without habitation.

The criteria for determining an extreme event are different depending on the location. For example, in Toulouse, a heat wave is defined as a period of at least three days with night-time temperatures above 21°C and daytime temperatures above 36°C. In Brest, a heat wave is confirmed if for at least three days it is more than 16°C at night and more than 28°C during the day.

### 2. What is the link with climate change?

In January 2014, intense rainfall caused catastrophic flooding in the United Kingdom. A scientific analysis concluded that climate change has increased the likelihood of rainfall of this magnitude by 43%. This is because warmer air holds more humidity, which tends to cause heavy rainfall.



In Australia, the summer of 2013 was the hottest since records began. Such consistently high temperatures have encouraged bushfires in the southeast and severe flooding in the northeast. According to a scientific study, anthropogenic warming has increased the likelihood of such heat records by five times (500% increase).

Flooding in the United Kingdom and a heat wave in Australia are just two examples of extreme events that, because of anthropogenic warming, are now much more likely to happen. Heat waves and heavy rainfall (rain that falls in heavy or even torrential amounts and can cause significant damage because of its violence) are some of the extreme

events that tend to be more frequent or intense.

However, while the global number of extreme events is not growing, their intensity and impact are increasing. The number of very cold days and nights, for example, has decreased overall as the climate warms. The Intergovernmental Panel on Climate Change (IPCC) points out in its 2012 report on extreme events that "Climate change is altering the frequency, intensity, extent, duration and timing of extreme weather and climate events, and may increase these events to unprecedented levels."

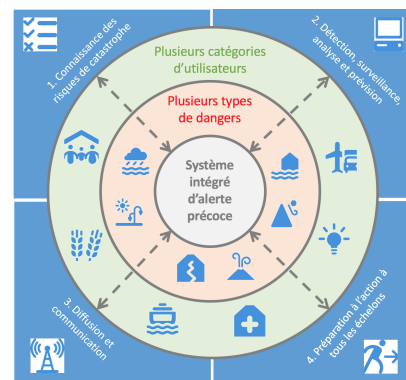
### 3. Early Warning Systems

On March 23, 2022 (World Meteorological Day) the UN revealed one of these new goals: Within the next five years, every inhabitant of the planet must be protected by early warning systems for extreme weather events. The UN Secretary General, António Guterres, has charged the World Meteorological Organization (WMO) with this mission.

#### a. Protection de la population

Investment in protecting the population from this type of threat is needed, as temperatures will continue to rise. However, one third of the world's population, mainly in the least developed countries (LDCs) and small island developing states (SIDS), is still not covered by early warning systems. In Africa, the situation is even worse: 60% of people are not covered by these systems. This is unacceptable in view of the worsening consequences of climate change.

Around the world we are seeing the impacts of climate change in the form of more extreme weather events. We are seeing more intense heat waves, droughts and forest fires. As there is



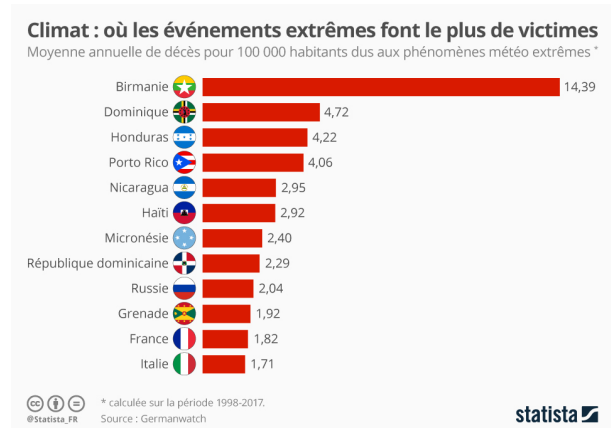
more water vapor in the atmosphere, this leads to extreme rainfall and deadly floods. Warmer oceans are causing more powerful tropical storms and rising sea levels are increasing the damage from these storms.

### b. A few numbers

Over the past fifty years, a disaster related to extreme weather, climate or water events has happened almost every day on average (killing 115 people and causing \$202 million in daily losses (according to a WMO report on disaster statistics)).

On the one hand, this same number has increased five times during this fifty-year period, mainly due to anthropogenic climate change.

On the other hand, thanks to better warning systems, the number of deaths has been divided by almost three during the same period, by means of more accurate and efficient weather forecasts.



### c. Early warning, an effective system

In its "Adapt Now" publication, the Global Commission on Adaptation found that early warning systems are the most cost-effective of all the adaptation measures listed in the publication. It also states that just providing 24-hour advance warning of a hazardous weather event can reduce damage by up to 30 percent, and that spending \$800 million on such systems in developing countries would avert losses of between \$3 billion and \$16 billion per year.

Despite these considerable benefits, one in three people worldwide is still not covered by these services, and this proportion is almost twice as high in Africa.

Despite these grim statistics, we see that improved multi-hazard early warning systems have significantly reduced mortality. We are now better equipped to save lives: supercomputers and satellite technologies have enabled huge advances in forecasting and have resulted in services adapted to users' needs. Worldwide, the number of deaths related to this issue is decreasing decade by decade, from an average of more than 50,000 deaths per year in the 1970s to less than 20,000 in the 2010s. During the 1970s and 1980s, an average of 170 deaths related to these phenomena were recorded each day. This average has continued to decline to 40 deaths per day.

## RELEVANT UN TREATIES AND EVENTS

21/03/1994

The **United Nations Framework Convention on Climate Change** (UNFCCC) ([here](#)) recognizes the existence of climate change and human responsibility for it. It imposes on industrialized countries the responsibility to fight against it and sets an objective: the

stabilization of greenhouse gas concentrations in the atmosphere at a level that does not endanger the global climate.

16/02/ 2005

Entry into force of the **Kyoto Protocol** ([here](#)) (ratified by 55 countries) which aims to reduce global greenhouse gas emissions to achieve a global reduction of these emissions of 5.2% between 2008 and 2012 compared to 1990.

04/11/2016

Entry into force of the **Paris Agreement** ([here](#)) which aims to limit global warming to well below 2°C, preferably 1.5°C, above the expected level. The Paris Agreement is a major step forward in the multilateral process of fighting climate change because, for the first time, a binding agreement unites all nations around a common cause to find solutions to fight climate change and adapt to its effects.

08/03/2022

The **Glasgow Climate Pact** ([here](#)) highlights the urgent need to scale up action to improve adaptive capacity, increase resilience and reduce vulnerability to climate change.

## POSSIBLE SOLUTIONS

Investing \$1.8 trillion globally in five areas from 2020 to 2030 could generate \$7.1 trillion in total net benefits



Strengthening  
early  
warning  
systems



Making  
new  
infrastructure  
resilient



Improving  
dryland  
agriculture  
crop production



Protecting  
mangroves



Making  
water resources  
management  
more resilient

#AdaptOurWorld



↔ First of all, there is little doubt about the urgent need to deepen our research on the events studied, so as to consolidate our knowledge about this type of threats. In this way we will be able to prevent these dangers more accurately and effectively, thus reducing the damage considerably.

✦ We also need to reduce the rate of CO<sub>2</sub> emissions considerably and quickly so that the air is less polluted and less hot. This will, over time, reduce the intensity of extreme weather events and eventually reduce the damage caused by them.

✦ Next, we need to develop the capacity of all countries to issue alerts as disasters approach, so that the population is warned in time and can take refuge until the danger has passed. This is essential because a country without a warning system is extremely vulnerable to this type of attack and risks a large number of material and human losses.

✦ The Systematic Observation Financing Facility (SOFF), a financing mechanism created at COP 26, is an existing solution that can be improved. Its goal is to increase the supply of basic weather and climate observational data and to address gaps, especially in developing countries.

✦ [The Climate Risk Early Warning Systems \(CREWS\)](#) Initiative is a solution to the lack of capacity in early warning systems in vulnerable countries to save lives. This involves ensuring that those most at risk receive, understand, and respond to warnings about extreme events. This initiative is clearly a success and now has over \$90 million in funding. However, it can be spread more widely.

✦ Finally, there remains a need to improve the capacity that countries have to act on these warnings, and to respond in a way that is human-centered, inclusive, and accessible to all.

### Guiding questions:

1. Is your country greatly affected by these types of events?
2. If so, does your entire population have access to effective early warning systems?
3. Have you put in place means to protect your infrastructure/agriculture etc?
4. Can you afford to buy this kind of equipment? If not, are there allies who could help you financially?
5. (ref q.1) If not, do you have allies who are greatly affected by this type of event? Do they support your business? Does this cause economic hardship for them? Can you help them financially?
6. Does your NGO/company work to provide safe access to early warning systems for extreme weather events for the general population?
7. Is your country/company willing to develop its market based on renewable energy to reduce its CO<sub>2</sub> footprint?

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- [Timeline of climate negotiations from 1988 to the present](#)
- [Kyoto-wikipedia protocol](#)
- [Extreme weather events in a changing climate](#)
- [Extreme weather events, a consequence of climate change?](#)
- [UNFCCC](#)
- [Extream weather events](#)

### Vidéos:

- ▶ [WMO State of the Global Climate 2021 Provisional report - October 2021 - French](#)
- ▶ [Message on the occasion of World Meteorological Day 2022 - French](#)
- ▶ [WMO Atlas of Mortality and Economic Losses from Weather, Climate and Water Extre...](#)
- ▶ [Improving early warnings in the Caribbean, Pacific and Southeast Asia - 29 June 2022](#)