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2024 REPORT

MOVING TOWARDS A GLOBAL CRISIS APPROACH

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AVENUES TO BUILD OUR RESILIENCE TO GLOBAL SHOCKS

PREFACE

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Towards a Global Approach to Crisis

Over the past four years we have witness an increase in the number of crises globally. These crises have occurred from a wide range of Hazard Triggers, of a natural, biological, man-made or man-induced variety interacting with growing inequalities, political instability and declining trust in "The State" and resulting in growing humanitarian demands, hardships for many, forced displacement, economic hardships, decline in local economies and a general slowdown of the global economy. In fact, the series of events commencing with the COVID 19 Pandemic in 2020, the warn in the Ukraine, the Droughts, locus infestation and conflicts in the Horn of Africa to the conflict in Gaza have led to a decline in the global

economy or at best a significant slowing in economic growth. Whilst everyone in the world is likely impacted by these crises, in some way or form, the long held conventional view is that it is the poor and most vulnerable who are always hardest hit by these events. Is there a bucking of this trend? Should the wealthy or developed nations be wary of a widening of the scope of impact of these crises?

Whilst the trend remains that the poor are the hardest hit however the nature of the world today is that we have multiple and interdependent systems which are themselves highly exposed to events such as a global pandemic but also events that are local but are synchronous in nature. The systemic and complex nature of today's crises are increasingly threatening global stability, sustainable economic growth and development straining even the resources of the Global North forcing many to concentrate their resources to accelerate green recovery agendas, investing to reduce the long accumulated social, physical and economic exposure and build their resilience. This approach along with the weakening of growth momentum in the Global Economy has and will no doubt curtail investments in addressing the sustainable development goal objectives and in particular addressing targets aimed at poverty reduction. The result, a vicious cycle, characterised by rising unmet Humanitarian needs ranging from food insecurity and mounting numbers of displaced population and declining human security.

The evidence suggests that the past approaches to tackling crises have not worked. In fact, that approach to tackling crises (locally, nationally or globally) have largely been within models fosters a short term and "event centric" thinking and approaches. Secretary General Antonio Gutteres has been quoted as saying: "these unprecedented times call for unprecedented actions". These unprecedented actions will require a new paradigm that recognizes that the crisis is an outcome of development failures often at a systemic level. The signature of these failures can be found in a closer and more concentrated attention to root causes and drivers that give rise to most crises. The new approach must shift from a focus solely on tackling the risks of crises proximal to an adverse event to managing these risks across varying time scales allowing for timely and more proactive interventions strategically across the Social, Economic, Environmental, Technological and Political domains. This position paper will explore some of these development approaches and their potential for fostering greater success in preventing a crisis or reducing the scale and scope of its impact.

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EXECUTIVE SUMMARY

Military and domestic security forces, as well as civil security services, are key players in global crisis management. They are fully involved in every phase of a crisis, from prevention to initial response, including management and recovery. By guarding borders, guaranteeing security and training the population in emergency situations, these players contribute to reducing risks and mitigating the impact of disasters. When a crisis occurs, thanks to their rapid and coordinated intervention, help can be given to the population and essential operational resources can be provided to political decision-makers. Finally, after the crisis, they secure the affected areas, aid reconstruction and help to restore vital services.
This report, written for EUROSATORY 2024, the Global Defence and Security Event, provides an international perspective on the main challenges and issues facing crisis management in the future.

Systemic crises and protean risks

In February, at the 60th Munich Security Conference, Antonio Guterres, the UN Secretary-General, called for the creation of «a new global order that works for everyone». A new global order at a time of permacrisis is a bold demand. Many risks result from these successive crises, and whether they are geopolitical, public health-related, climatic, environmental, cyber or economic, their consequences are feared by local populations, who are on the front line. All the more so given that by 2030, taking current climate forecasts into account, the world will have to deal with over 560 natural disasters a year. By 2100, it is predicted that there will be a 50% increase in forest fires, with record numbers of hectares burnt already rising each year. In February 2024, Chile experienced devastating fires, claiming more than one hundred lives and affecting the most vulnerable populations. Other climate events, such as volcanic eruptions, also need to be factored in. According to the Smithsonian Institution, there are 1,350 active volcanoes in the world. In 2021, 79 eruptions of 74 different volcanoes were recorded. The multiplication of extreme weather events provides further evidence of the widespread atmospheric disturbances that are causing concern among authorities all over the world.
Water scarcity is another concern. "The world's water crisis is not simply coming: it is here, and climate change will only make it worse", was the warning given by Henrietta Fore, Executive Director of UNICEF.
Successive heat waves, leading to drought, are having significant consequences on access to water for the global population. «The world is facing an unprecedented water crisis, exacerbated by climate change», stated the World Resources Institute (WRI) in its latest report. Water shortages will worsen over the years.
The war in Ukraine, meanwhile, marked the return of food insecurity, particularly in Europe. Developing countries are more greatly affected by this insecurity. In Sudan, where war continues to rage, nearly 40% of the population is affected by acute food insecurity. Since 7 October 2023, the population in the Gaza strip has been suffering from famine. There are 2.2 million people facing

a violent hunger crisis (out of the 2.4 million inhabitants in the enclave). According to Josep Borrell, High Representative of the European Union for Foreign Affairs and Security Policy, starvation is being "used as a weapon". In addition to these crises is the risk of a pandemic, which can no longer be ignored.
Furthermore, cyber-attacks are increasingly frequent, and considered as a new tool for destabilisation. Critical infrastructures are already, and could be even more, on the front line of tomorrow's cyberattacks, with the risk of essential services, such as access to electricity, the internet, transport or health services, being brought to a standstill.
Geopolitical crises, which have become more frequent in recent years, are part of the panorama of contemporary risks. In two thirds of countries, political risk is higher than last year, at a time when 51% of the global population is going to the polls in 2024 to elect leaders in more than 70 countries.

Multiple challenges to overcome

Lack of funding to deal with the multitude of crises is one of the biggest issues faced by those working in the field (and by extension local populations), as needs are largely underestimated. Joe Biden is calling for USD 105 billion in the United States alone to be spent on responding to global crises. The European Commission is proposing an increase of EUR 75 billion compared to its initial budget to get by until 2027. Within the UN, allocated budgets are stagnating at USD 300 million, while missions and needs are multiplying. "The need for humanitarian aid for populations in need is skyrocketing. Inflation is putting a strain on our budget", declared Gilles Michaud, UN Under-Secretary-General for Safety and Security. The UN continues to deplore a funding "bottleneck". According to the World Bank, developing countries will need USD 140 to 300 billion in 2030 to take measures to adapt to climate change and reduce risks.
Added to these financial problems, which are out of touch with what is actually happening in the world, there are "still gaps in generating and making accessible risk information, the related tools that are able to generate disaggregated and geospatial data down to the lowest level of analysis, and also in understanding the vulnerability of human systems to cascading and systemic risk", according to the United Nations International Strategy for Disaster Reduction.

Country-specific crisis management

Romania has interesting means of anticipation. In Spain, in the event of an emergency, only one person can be responsible. In Portugal, however, responsibilities are distributed at national level, from district to local. France also has a territorial-based approach focused on three distinct phases: prevention, during the crisis and post-crisis. At operational level, the *Centre opérationnel de gestion interministérielle des crises* (COGIC – Interdepartmental crisis management operations centre), which coordinates interventions, and the *Unités d'instruction et d'intervention de la sécurité civile* (UIISC – Civil protection training and response units), complete the local emergency response system.

Australia uses public-private partnerships to promote resilience among the population. In Chile, particularly prone to earthquakes, the authorities recently created the SENAPRED, the national disaster prevention and response service. The United States organises the continuity of government operations thanks to the Federal Emergency Management Agency (FEMA), whose 2022-2026 strategic plan is based on three pillars: make equity the foundation of managing emergency situations; lead the whole community in climate change resilience and improve its state of readiness; and, finally, measure and strengthen its capacities to meet current and emerging needs. Japan has succeeded in raising the awareness of its entire population, who now receive disaster training, starting in nursery school and until they reach higher education. This policy is paying off, as proven by the fallout from the latest earthquake in January 2024, which resulted in fewer than 80 people losing their lives in a region of 1.2 million inhabitants. By way of comparison, in 1923 an earthquake of magnitude 7.9 struck the country, resulting in the death of 110,000 people. By reacting swiftly to warnings, the public could be quickly evacuated to safety. The government has also installed seismometers throughout the country. They forecast and inform potential earthquake impact zones by broadcasting warnings on radio and television. The Japanese approach is now a benchmark. In France, despite President Emmanuel Macron promising, in 2017, that 80% of the French population would be trained in first aid by the end of his first five-year term, in reality only 40% of citizens are trained in life-saving techniques. China, Argentina, Switzerland, Guatemala, the Philippines and Portugal are also part of this world tour of global risk and crisis management.

European and international coordination at work

At European and international level, there are many crisis or risk management tools and mechanisms, which sometimes overlap one another and operate at different levels. The Euro-Atlantic Disaster Response Coordination Centre (EADRCC), a NATO tool, or the Sendai Framework at international level (which also applies at regional level) address the challenges of operational cooperation. At European level, the EU Civil Protection Mechanism combines with the Emergency Response Coordination Centre. The integrated political crisis response mechanism ensures the deployment of assistance and rapid, coordinated EU decision-making in the event of major crises. The RescEU reserve completes this European approach. This EU mechanism also works to improve citizens' readiness by providing more information. A risk and resilience culture is developing, particularly through a European risk management and civil protection project – RiskPACC – led by the German Fraunhofer research institute. It aims to improve coordination between citizens and civil protection in the event of a crisis and works on seven use cases.

> "According to the World Bank, developing countries will need USD 140 to 300 billion in 2030 to take measures to adapt to climate change and reduce risks.

Innovation: another keystone of a global approach

Detection and anticipation tools, such as intelligent threat detection platforms, are growing worldwide. A case in point is the cooperation between the United States Geological Survey and the Australian company Q-CTRL to study the use of quantum computing in the early detection of natural disasters and the monitoring of climate change. It is estimated that applying quantum computing can make it possible to access data to improve management of underground water resources, monitor the ice cap and discover and use energy and mineral resources. Chile, the Czech Republic and some countries in Africa are developing new early warning systems to alert the population in the event of an upcoming disaster. In 2022, one third of the global population, mainly in developing countries and island states, was not covered by this type of warning system. The UN thus decided to act. By 2027, thanks to the Early Warnings for All programme, everyone on Earth should be informed of hazardous weather, water or climate events.
The United States is also developing solutions to minimise the effects of crises. Drones are increasingly used to assess damage and to deliver supplies in areas that are the most difficult to access.
Emergency care, triaging and evacuating the injured, psychological support, setting up and managing camps, food safety and nutrition, installation of hospitals, population safety, accommodation, water and sanitation are just some of the needs being met by innovative companies around the world.
The development of communication nodes, satellite systems and the development of 5G and 6G complete a capability-based approach that gives first responders and those involved in the conduct of operations access to very high-speed broadband and its applications. Some innovations in water treatment, shelter construction and food supply also stand out. In the health field, where the need to create a resilient medical chain is an integral part of crisis management, mental health issues are increasingly being taken into account. The use of robots to provide psychological support to disaster victims is gradually developing.

Avenues to build our resilience to global shocks

Avenues for reflection have been put forward by many experts to enable everyone to understand and reflect upon tomorrow's risk and crisis management, which needs to evolve to meet the ever-changing challenges ahead. The entire model needs to be reinvented, based on agility. It is an essential approach in the permacrisis era.
Preparing for the future requires our public authorities to publish a global, agile and coordinated strategy that incorporates a decompartmentalised and systemic vision of risks, as well as the necessary strengthening of cooperation and governance at every level. This will involve a series of measures, including: investing in tools for collecting and analysing risk data; enabling national risk reduction strategies to be formulated that are suited to the situation; focusing plans and strategies on social cohesion in order to effectively promote society's resilience as a whole; taking account of the

psychological dimension and the impact of the crisis on individuals in crisis management plans; strengthening and adapting civil security policies to track developments in the scale and type of risk.
Strengthening cooperation and governance at every level will entail assigning a national coordinator in each country in charge of preparing the nation to better manage crises. This also requires the clarification of the body of regulations, which has become illegible due to a mass of sometimes contradictory frameworks, improving territorial continuity, increasing funding to support development, anticipating a possible withdrawal of insurance cover, stepping up training for operational players to develop their skills in the use of new technologies, and improving crisis communication.
To deal with the funding challenge, developing new, more appropriate mechanisms to encourage resilience also seems to be one of the avenues to explore. It therefore seems necessary to step up efforts on crisis preparation and forecasting, reassess the budget allocated to the Major Natural Risk Prevention Fund, invest in innovative technologies for better detection, anticipation and preparation, as well as to manage and prepare the nation's resilience by encouraging public-private co-production and pooling plans.
Strengthening the risk culture in attitudes and at every level would appear vital within society. Therefore, the use of digital technology and mobile telephony can be a way to improve communication to citizens and broadcast the warning. For people without a connection or who are isolated, a hybrid plan would allow them to be informed. Training in life-saving techniques and behaviour could be made compulsory and updated yearly, including for schoolchildren, with a culture of resilience to be reinforced. The systematisation of feedback on exercises and crisis management, within the framework of an interdepartmental structure in charge of resilience, is another point to consider.
Finally, international cooperation agreements and coordination mechanisms must be supported and consolidated.

Faced with increasingly complex crises and hybrid threats, it has become necessary to redesign our model and reinvent ourselves.
Anticipation, prevention, coordination, funding and technological tools will be the assets of this crisis management planning.

The EUROSATORY 2024 exhibition is a unique platform where the latest industrial and operational innovations are showcased, offering concrete solutions to meet current and emerging crisis management challenges. It provides an opportunity to discover a wide and varied range of products, equipment, technology and services offered by the main players in the defence and security sector.

On Thursday 20 June at 2pm, a panel discussion "Strengthening cooperation for more effective crisis management (helped)" will be dedicated to this subject at the show, with contributions from senior figures from international institutions involved in crisis management.

The full report will be available at EUROSATORY from 17 to 21 June 2024 at the Paris Nord Villepinte exhibition centre.
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INTRODUCTION

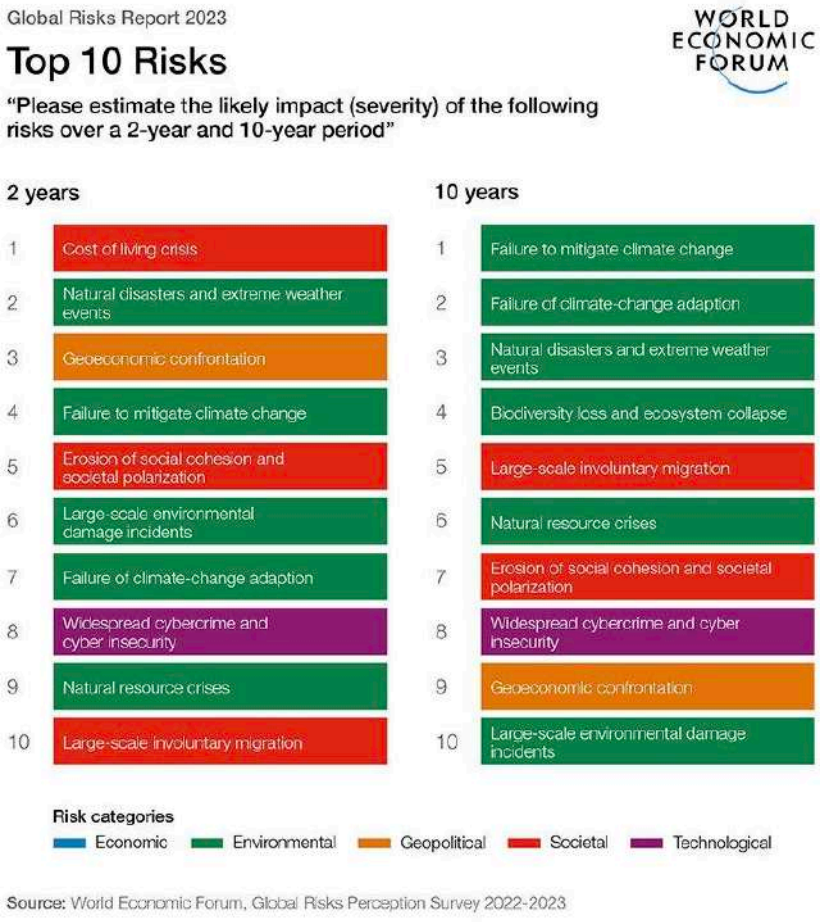
More than ever before, the world is facing a multiplication of protean crises: armed conflict, security, public health, economic ecological, industrial, humanitarian, etc. While risk and crisis management processes and doctrines provide the opportunity to respond as effectively as possible in an emergency, the succession of crises requires constant adaptation from the players concerned, whether public or private, governmental and associative, together with increased resources. Looking forward to the next two years, the Davos World Economic Forum held in January 2024 identified four main risks for organisations and populations: the cost of living crisis, natural disasters and extreme weather events, and geo-economic confrontations. The failures of countries to contain climate change, the erosion of social cohesion and the consequences of large-scale environmental incidents also feature prominently in the top 10 risks facing the world. The organisation also foresees cyber-attacks against agricultural management and production systems, financial services, civil security, critical infrastructure (health, food, transport, energy), and information systems, including submarine and satellite telecommunications.

A global approach is required to deal with crisis situations, allowing for the implementation of a national or multi-national strategy and involving political, civil and military instruments. This requires countries, international organisations, non-governmental organisations and private companies to act in a concerted manner. Serving the citizens of the world, security is something to be planned and prepared during peacetime. Anticipating, practising, training, innovating, cooperating, sharing and reinventing, bringing together all players on an international scale, are necessary to deal with and meet the challenges of tomorrow's world.

Alongside the United Nations 2030 Agenda for Sustainable Development, the European Union's thematic programme on Peace, Stability and Conflict Prevention, with a budget of nearly EUR 900 million for the 2021-2027 period, aim to build capacities for crisis prevention and preparedness and to address global, trans-regional and emerging threats. These initiatives are intended to be strategic compasses to give direction and meaning to the actions to be taken.

In view of the plethora of crises with diverse and increasingly devastating consequences at national, European and international level, what do governments and operational teams need to anticipate, adapt and cope?

- What resources need to be deployed?
- What are the persisting issues and challenges?
- How do public authorities respond and what innovations do manufacturers and private companies propose?
- How can we collectively conceive tomorrow's responses to new crises that could challenge the world order?



World Economic Forum, Global Risks Perception Survey, 2022-2023.

CHAPTER 1

Crisis management in the world: overview and challenges

SYSTEMIC CRISES AND PROTEAN RISKS

There are as many definitions of the word «crisis» as there are authors addressing the subject. The term derives from the Greek (krisis), which refers to an unforeseeable and spectacular rupture. Patrick Lagadec, a world-renowned specialist and pioneer in crisis management in France and in Europe constructs the notion at the intersection of three words: surge, disruption and rupture. A crisis engulfs violently, causes devastation, and suddenly prompts a break in habits and operating modes. Thus, according to the Institut français des Hautes Etudes de la Sécurité Intérieure (INHES): "A crisis is a rapid breakdown of all reference points, a deregulation of mechanisms and usual reactions. It is a dynamic that feeds on itself through a snowball effect, causing a growing inability to control uncertainty."Therefore, a crisis is above all characterised by the surprise effect, placing individuals in a state of emergency and threatening an entire society.[1] Both a sudden and disruptive event, it also marks a development that reveals structural weaknesses inherent in a system. Today, crises occur in juxtaposition, without interruption, and have moved from being ephemeral to becoming permanent. We are in the "permacrises" era, hence the use of "crises"in the plural. Now systemic, crises result from a wide range of risks: climatic, economic, health, industrial, geopolitical, humanitarian, food, security, etc. "We will face more and more negative impacts from the climate crisis, in Europe and the rest of the world. There will be more catastrophic floods, but also more wildfires. However, we must not forget that the main cause of the humanitarian crisis remains conflict (armed conflict, civil war, guerilla warfare, terrorism, etc.). 80% of humanitarian crisis is due to conflict. A good illustration of that is today's Russian aggression against Ukraine" says Janez Lenarčič, European Commissioner for Crisis Management.

1. www.cairn.info/la-gestion-de-crise--9782130812616-page-11.htm

Environmental and climate risk: a challenge for human rights

Tsunamis, tornadoes, earthquakes, forest fires, volcanoes, etc.: atmospheric disturbances are raging and causing concern to authorities around the world. Increased temperatures, pollution and loss of biodiversity, multiplication of extreme weather events: "Environmental threats are worsening conflicts worldwide and will soon constitute the biggest challenge to human rights", claimed the UN. This "global crisis» is already having a direct impact on these rights, in particular: «the rights to adequate food, water, education, housing, health, development, and even life itself." "Addressing the environmental crisis is therefore a humanitarian imperative, a human rights imperative, a peace-building imperative and a development imperative", stressed the organisation.

In February 2022 the United Nations Development Programme forecasted that megafires would increase by more than 50% between now and 2100. That year, Europe experienced a major upsurge in fires in Europe in the summer, far exceeding the averages established between 2006 and 2021. Between June and August, Croatia, Cyprus, Italy, Portugal, Romania, Slovakia, Spain and France experienced fires that were far more devastating than in previous years. This threat has led to increased investments in firefighting. Since 2020, 12 of the 27 European countries have dedicated more than 0.5% of their GDP to it, with Romania going as far as 0.8%.[2]

These additional costs are coupled with the need to increase human and material resources. In France, the 66,000 hectares burnt mobilised almost 10,000 firefighters every day. The air fleet, currently composed of 12 Canadairs, seven Dash and three Beechcraft twin engines is deemed «insufficient» by the French national fire-fighters federation (FNSPF) to efficiently combat future episodes.[3] The French Ministry of the Interior has increased the equipment available to the forces, including additional Canadairs, all the while acknowledging that "this target will be difficult to achieve due to the lack of manufacturers currently on the market."[4]

On the other side of the Atlantic, Chile was hit in 2024 by devastating waves of fires. In particular, they ravaged the region of Valparaiso, in the centre of the country, killing over one hundred people and affecting the most vulnerable.

> “ Addressing the environmental crisis is a humanitarian imperative, a human rights imperative, a peace-building imperative and a development imperative.

2. « Fires in the EU call firefighters to the test », Eurostat - Commission Européenne, août 2022.
3. Albertini, Antoine. « Les pompiers veulent repenser le modèle français de la sécurité civile, du financement à la doctrine », Le Monde, septembre 2022.
4. Ibid.

According to the Chilean president, this is one of the biggest tragedies experienced by the country since the 8.8 magnitude earthquake in 2010 which was followed by a tsunami, causing 500 deaths. These forest fires occurred while the heat wave - resulting from the El Niño climate phenomenon - hit the southern cone of Latin America. These phenomena are worsened by global warming. After Chile and Colombia, the heat wave moved towards Argentina, Paraguay and Brazil. According to the Smithsonian Institution, there are 1,350 active volcanoes in the world. In 2021, 79 eruptions of 74 different volcanoes were recorded. Most are situated along tectonic plates, such as Hunga Tonga, on the edge of the Pacific plate, which in January 2022 experienced one of the most powerful volcanic events. Others, like the Piton de la Fournaise on Reunion Island, on the African tectonic plate, originate from hot spots, a sort of fault, in the Earth's crust. The entire planet is concerned. Western America has around 20 volcanoes that are considered dangerous, such as Mount Saint Helens, Mount Rainier, Mount Hood and the Three Sisters. The Cascade Volcanic Arc, which ranges from British Columbia to California in the south, via Washington and Oregon, has 26 active volcanoes. In Europe, the eruption of Cumbre Vieja in 2021 and Eyjafjallajökull in Iceland in 2010 were reminders that the continent is not immune to large-scale volcanic events. In the region of Naples (Italy), the supervolcano in the Phlegraean Fields is slowly waking up and has seen a growth in seismic activity since 2005. The Mayon and the Taal in the Philippines, the Santa Maria in Guatemala or the Nevado del Ruiz in Colombia are also under surveillance. Natural disasters lead to the population being displaced, with the risk of impoverishment, malnutrition and disease. In the EU, between 1980 and 2020, they affected nearly 50 million people and cost Member States EUR 12 billion on average per year. "Disasters and conflict are compounding one another. Countries facing fragility, conflict, and violence challenges are particularly vulnerable to disasters due to weakened government capacity. Conversely, disasters can intensify existing tensions, leading to an increased risk of violence. Adding to this vulnerability are the impacts of climate change. Climate change threatens to push an additional 100 million people into extreme poverty by 2030", states the World Bank.

Water scarcity: the next global pandemic?

"The world's water crisis is not simply coming, it is here, and climate change will only make it worse", was the warning issued by Henrietta Fore, Executive Director of UNICEF. The institution predicts that by

Climate change threatens to push an additional 100 million people into extreme poverty by 2030.

2040, one child in four will live in a region where water stress will be extremely high. "Drought is on the verge of becoming the next pandemic and there is no vaccine to cure it", warns Mami Mizutori, the UN Secretary-General's Special Representative for Disaster Risk Reduction. The death of cattle, poor harvests, drought, famine and conflict "disproportionately affect the poor and marginalised around the world, at a cost measured in loss of human life, loss of livelihood and impoverishment", stresses Ronald Jackson, Head of the Disaster Risk Reduction and Recovery for Building Resilience Team in the UNDP (United Nations Development Programme). Madagascar is the first country faced with famine related to global warming. In 2021, Brazil issued its first drought alert for a century, fearing for its electricity supply, which is highly dependent on its hydroelectric power stations, and for its agricultural industry which represents one third of its GDP.
The exacerbation of water stress is adding additional pressure to the heart of Africa, where 418 million people do not have access to drinking water and 779 million people lack basic sanitation services.[5]

According to Ronald Jackson, Head of the Disaster Risk Reduction and Recovery for Building Resilience Team in the UNDP, more than five billion people could be affected by water scarcity by 2050.

A global food crisis: An additional 19 million people affected by famine

The war in Ukraine saw the return of food insecurity in developed countries, including Europe, where a slowdown in production and Ukrainian and Russian wheat exports led to inflation in excess of 10% in 2022. Revealing a global crisis in the making for several decades, this conflict merely "exacerbates pre-existing pressure on food prices and supply" stressed US Secretary of the Treasury, Janet Yellen.[6] The price of agricultural raw materials began to rise in July 2020 as a result of the combination of economic events (Covid-19; climate crises that affected harvests and means of production and subsistence; a global economic slowdown; an increase in the price of food, fertilisers and oil), and structural factors (interdependence of the world's agri-food systems, structure and operation of wheat markets, which are volatile and subject to speculation, increase in the industrial use of cereals to the detriment of human food, demographic explosion, etc.).

Drought is on the verge of becoming the next pandemic and there is no vaccine to cure it. By 2050, five billion people could be affected by water scarcity.

5. World Meteorological Organization, September 2022.
6. La crise alimentaire mondiale pourrait plonger 10 millions de personnes dans la pauvreté (lefigaro.fr)

While for Europe the issue is not so much the availability of food as their "affordability", in other regions already suffering from food insecurity, the current crisis poses an existential threat. Over the 2022-2023 period, an additional 11 to 19 million people are thought to have been plunged into famine, according to the Food and Agriculture Organization (FAO), particularly in the Near and Middle East and North Africa. The humanitarian crisis in East Africa is critical. The food crisis has been ongoing since October 2020, affecting 14 million people. In Somalia, six million people are concerned, i.e. 40% of the population. "Hundreds of thousands of lives are already at risk. Immediate action is needed to avert a humanitarian catastrophe", warns El-Khidir Daloum, Country Director for Somalia of the World Food Programme (WFP). Global warming is to blame, as the area is experiencing a shortfall in rainfall for the fourth year in a row. Somalia imports 92% of its rice from Russia and Ukraine, and the supply lines are still blocked. Ethiopia and Kenya are also in the grip of a humanitarian crisis: "If the world does not widen its gaze from the war in Ukraine, and act immediately, an explosion of child deaths is about to happen in the Horn of Africa", warns Rania Dagash, Deputy Regional Director of UNICEF for Eastern and Southern Africa. Ten million children need vital assistance in Djibouti, Ethiopia, Somalia and Kenya.

We can also expect migratory flows likely to destabilise destination countries; a decline in democracy in countries where the blackmail of hunger and poverty will encourage the return or confirmation of hard-line or even authoritarian regime, or even the rise in armed groups which will feed of the inability of governments to respond to the crisis and the distress of the most vulnerable populations. Europe is not immune, albeit on a different scale, as illustrated by social movements that are multiplying in several countries.

7. https://wmo.int/media/news/new-report-shows-impacts-of-climate-change-and-extreme-weather-latin-america-and-caribbean
8. Ibid
9. Ibid

LATIN AMERICA IS BEARING THE FULL BRUNT OF THE EFFECTS OF CLIMATE CHANGE

Due to abundant rainfall, mega droughts, heat waves, massive deforestation, melting glaciers, etc., the situation is a cause for concern. The 2021 Report on the State of the Climate in Latin America and the Caribbean by the World Meteorological Organization reveals the highest rates of deforestation since 2009. Glaciers in the Andes have lost at least 30% of their area in less than 50 years and the Chile mega-drought is entering its 13th year, constituting the longest in one thousand years.[7]

The consequences are already visible: damaged infrastructure, displaced populations, loss of human life, 2.6% drop in cereal harvests in 2020- 2021. In Brazil, the associated economic loss is estimated at USD 3.1 billion.[8] In 2020, out of a population of around 590 million, 209 million were living in poverty. Of the 175 disasters registered by the United Nations Office for Disaster Risk Reduction in 2020-2022, 88% resulted from meteorological phenomena and accounted for 40% of deaths.[9] The populations of Guatemala, El Salvador and Nicaragua were plunged into unprecedented food insecurity following the Eta and Iota hurricanes at the end of 2020. In 2021, 25.5% of the population in these States lacked food on a daily basis.

AFRICA: 110 MILLION PEOPLE AFFECTED BY RISING SEA LEVELS BY THE END OF THE DECADE

Africa is disproportionately affected by rising temperatures. 2021 was one of the hottest years in the history of the continent. In recent decades, Lake Chad has lost 92% of its surface area. The sea level is constantly rising and causing coastal floods, mainly along the Red Sea and the south-western Indian Ocean. This threat is expected to directly affect almost 110 million people by the end of the decade, but it has already weakened Mozambique, which has been battered by violent tropical cyclones. Extreme floods are affecting the Democratic Republic of Congo, South Sudan, Congo-Brazzaville, Burundi and Nigeria, while droughts are contributing to the proliferation of mega-fires and sandstorms in North Africa. By 2050, these two risks will represent an annual cost of USD 50 billion for African states.[10] Similarly, the disappearance of glaciers in East Africa is affecting the amount of future rainfall in the region and led to a drop in agricultural productivity of 34% in 2021. A 1.5°C rise in temperature would lead to a 9% yield loss for maize in West Africa and 20 to 60% for wheat in southern and North Africa.

10. WMO, State of the Global Climate 2021, Genève, Suisse, World Meteorological Organization, 2022.

We are not immune to another pandemic crisis

In September 2021, the pandemic had claimed 4.7 million victims. The global economic slowdown led to the loss of 255 million jobs and badly impacted the 1.6 billion people working in the informal economy. The rise in poverty, famine and child labour that followed is unprecedented. It also widened gender inequalities. And the respite it gave to plant and animal species and climate change was too brief to have had any positive impact on ecosystems.

The Red Cross worries that the world remains "dangerously unprepared" for the next public health crisis, even though it could occur at the same time as natural disasters or armed conflicts. Strong prevention and preparedness systems are "severely lacking", despite the weaknesses highlighted by the Covid-19 pandemic, which "should be a wake-up call for the global community to prepare now for the next health crisis", according to Jagan Chapagain, Secretary General of the International Federation of Red Cross and Red Crescent Societies. The organisation believes that governments are no more ready now than they were in 2021 and that "the world must address inequitable health and socio-economic vulnerabilities far in advance of the next crisis". It estimates that by 2025, countries should increase their domestic health finance by 1% of GDP and global health finance by at least USD 15 billion per year.

The dreaded cyber crisis

The global cost of cyber-criminality is expected to be USD 20,000 billion in 2026. This figure is estimated at USD 10,500 billion per year between now and 2025 (Cybersecurity Ventures). With governments ensnared, businesses held hostage and citizens victims, cyber risks are one of the major concerns and therefore priorities for public and private players alike. Cyber-criminality and digital vulnerabilities are some of the most serious risks weighing on organisations this decade. Cyber-attacks are to be expected against critical infrastructures and operators of essential services (energy, transport, finance, drinking water, digital infrastructure, health, electronic communications, space). Criminal and state-backed hacking will increase pressure on organisations. In particular, they must be wary of theft, embezzlement, hacking and data destruction, as well as the infiltration of communications networks for the purposes of espionage, data alteration or takeover, or influence and disinformation campaigns on the Internet.

This upsurge has been encouraged by the global geopolitical context, which could see groups of individuals, previously not very well organised but rallying behind a common cause, express their anger in the form of cyber-attacks. The increase in attacks via supply chains must also be expected, along with phishing attacks via communication / collaboration applications commonly used by businesses. Connected devices will be increasingly exploited by hackers to mine crypto currencies. As for satellites and other space assets, they will be subject to numerous compromises. This will affect the everyday life of citizens, as these devices are essential for the operation of GPS, TV aerials, telephone communications, meteorology and bank withdrawals.

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Escalation of global geopolitical crises and risks

Conflicts, wars and the displacement of populations are the result of ever-increasing geopolitical crises, such as in Ukraine, Nagorno-Karabakh, Venezuela, Chad, Palestine, etc. The situation in the Middle East is foremost in the United Nations' concerns. "The impact of this conflict between the State of Israel and the Hamas movement could spread beyond the region, amplifying an already critical situation", declared Gilles Michaud, UN Under-Secretary-General for Safety and Security. Added to this are tensions in Southern Lebanon, instability in Afghanistan, food insecurity in Somalia, armed conflicts in Ethiopia and the Democratic Republic of Congo, unrest in Guinea, Haiti, etc. In the Sahel, the succession of military coups in Niger, Mali and Burkina Faso is an invitation to exercise greater vigilance. In Somalia, the combination of the government's offensive against al-Shabaab and the withdrawal of the African Union forces "threatens the stability of security in Somalia for years to come," warns Gilles Michaud. In Sudan, the powder keg is triggered again with every new coup. "Refugees tell of ethnic massacres, clashes, daily violence, atrocities and displacement. On the ground, we meet basic humanitarian needs, as well as providing access to education for children. But what these people need is a sense of security to look forward to a possible future."
The conflict in Ukraine could have far-reaching consequences. «The combination of the health crisis and the war will be a powerful reminder of the weaknesses and dependencies of our economy», stressed the French Economic, Social and Environmental Council in May 2022. The conflict has multiplied the inflationary dynamic set in motion in 2021 and now raises the question of how to deal with Ukrainian refugees, which leads to fears of saturation and disorganisation of common law emergency accommodation. European action in terms of civil protection and humanitarian actions has taken on its full meaning since the Russian invasion. "In practice, in Ukraine, we have set up three humanitarian logistics hubs with two components: warehouses where we can store certain foodstuffs or medicines, and a number of trucks that are available to our partners to transport humanitarian goods, particularly in areas of temporarily occupied and uncontrolled territory. More than 30 organisations use and provide these capacities", explains European Commissioner Janez Lenarčič.

AN OPPORTUNITY FOR CHANGE

The World Economic Forum (WEF) expects the next two years at least to be marked by multiple shocks. The world should, however, return to stability over the next 10 years. In view of the interlocking nature of risks, strengthening resilience in one field may have a multiplier effect by reducing associated risks, according to the WEF: "As a deteriorating economic outlook brings tougher trade-offs for governments facing competing social, environmental and security concerns, investment in resilience must focus on solutions that address multiple risks." This includes funding climate mitigation measures and investing in areas that strengthen human capital and development. For the organisation, "this is the moment to act collectively, decisively and with a long-term lens to shape a pathway to a more positive, inclusive and stable world."

CHAPTER 2

What strategic actions to anticipate and respond?

Taking account of the systemic nature of risks is necessary to deal with them effectively. Anticipating, preparing, adapting and thinking in terms of resilience are the four phases that need to be addressed and reinforced.

This involves several structuring actions:

- stronger international cooperation;
- skills enhancement at all levels, from planning to the field;
- establishment of clear methodologies;
- reinforcement of a culture of resilience;
- increased public-private partnerships and financing.

ANTICIPATING AND PREPARING FOR GLOBAL CRISIS MANAGEMENT WORLDWIDE

"We need to reflect the systemic nature of risk in how we deal with it. We need to improve how we tune our understanding of anthropogenic systems in nature to identify precursor signals and correlations to better prepare, anticipate and adapt. This means we must move away from working on distinct areas of risk (e.g. spatial, geographic, temporal, disciplinary) when designing and implementing interventions. We need to incentivize transdisciplinary integrated, multisectoral risk assessment and decision-making to improve efficiency, reduce duplication of effort and allow for connected, collective action," reports the United Nations Office for Disaster Risk Reduction (UNDRR).

The key to dealing with crises, which will continue to increase over time, lies in anticipation and adaptation. Although we can strengthen our capacity to respond to

minimise their effects "we must not neglect the other elements of the crisis management cycle: prevention and preparedness. We must invest more in these two elements", explains European Commissioner Janez Lenarčič. The European Commission has also developed a "network of knowledge, a platform for exchange, expertise and best practice for practitioners of humanitarian action, crisis management and civil security", adds Janez Lenarčič.

Stronger international cooperation

Encouraging cooperation between countries, international organisations, NGOs, businesses and other players is essential to foster a coordinated response to crises. Whether it involves inter-ministerial cooperation, between the different crisis management departments, or at European level through existing mechanisms, or at global level, it remains a key factor in anticipating and managing crises, as well as providing a resilient response to future ones.

The Euro-Atlantic Disaster Response Coordination Centre (EADRCC)

In 2022, NATO's Strategic Concept made joint crisis management one of its priorities. NATO's 2022 Strategic Concept expanded the notion of "crisis management" to "crisis prevention and management". Finding a balance between territorial defence and crisis management remains a challenge for the Alliance, as does the appropriate interpretation of the "360-degree approach". "Of course, the focus today is on deterrence and defence, which is what NATO feels most comfortable with and what it has done almost exclusively for the first forty years of its existence", stresses Thierry Tardy, political scientist, former director of the Research Division at the NATO Defence College in Rome, associate researcher at the Institut Jacques Delors in Paris. According to an estimation, this year, NATO – with the exception of the United States – could spend six times more on defence than Russia. In this context, some experts suggest that the European allies should invest more in continental defence and crisis management. The Euro-Atlantic Disaster Response Coordination Centre (EADRCC) is the organisation's main civilian emergency response mechanism in the Euro-Atlantic region. It operates 24/7 and involves all NATO Allies and partner countries.

"All EADRCC's tasks are performed in close cooperation with UN OCHA, which retains the primary role in the coordination of international disaster relief operations. EADRCC has been designed as a regional coordination mechanism, supporting and complementing UN efforts. NATO Allies and partners provide various forms of assistance, in particular search and rescue teams with dogs, fire-fighters and structural engineering teams, medical personnel and supplies, and seismic experts", details NATO.

In September 2021, 27 Allies and partner countries and 16 regional and international organisations met in North Macedonia to test their ability to respond together and save lives in the event of a major natural disaster. The "North Macedonia 2021" exercise provided the opportunity to test the Next-Generation Incident Command System (NICS), a collaborative platform that facilitates real-time disaster response coordination. Experience from previous exercises has already helped the Allies and their partners to save lives during hurricane Katrina in the United States and the Pakistan earthquake in 2005, floods in the Western Balkans in 2014, and forest fires and floods in Europe in summer 2021. EADRCC's support was recently requested by Ukraine to supply medical equipment. In 2023, over 20 NATO members and partners were deployed to Türkiye to help deal with the devastating earthquakes.

The Sendai Framework for Disaster Risk Reduction 2015-2030

Adopted in 2015 in Sendai (Japan), at the UN's third global conference on disaster risk reduction, this framework aims to substantially reduce disaster risk and losses "in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries." As a practical risk management framework, it links international agreements such as the 2030 Agenda, the Addis Ababa Action Agenda (Ethiopia), the Paris Agreement, the New Urban Agenda and the Agenda for Humanity. The 2030 Agenda, adopted in September 2015 by the 193 Member States of the UN, includes 17 sustainable development goals to reach by 2030, for people, planet, prosperity and peace through partnerships.

The "North Macedonia 2021" exercise tested the Next-Generation Incident Command System (NICS)

The Addis Ababa Action Agenda details a series of bold measures to reform global financial practices and generate investment to deal with a number of economic, social and environmental challenges. The Paris Agreement, also adopted in 2015 by 196 parties at COP 21, aims to maintain the average global temperature increase well below 2°C above pre-industrial levels and continue efforts to limit the rise in temperature to 1.5°C above those same pre-industrial levels. The New Urban Agenda, adopted in 2016 at the UN Conference on Housing and Sustainable Urban Development, Habitat III, which was held in Quito (Ecuador), defines the standards and principles for the planning, construction, development and management of urban areas. It is aimed at all urban stakeholders all over the world.

The Agenda for Humanity is a five-part plan aiming to ease suffering, reduce risk and mitigate vulnerability globally.

The Sendai Framework has the following objectives:

• prevent new disaster risks and reduce existing risks by taking integrated and global measures in the economic, structural, legal, social, cultural, environmental, technological, political and institutional field; as well as in the health and education sectors;

• reinforce the implementation capacity of developing and middle-income countries so that they have the means to deliver in line with their national priorities;

• measure progress against seven objectives: reduce mortality, the number of people affected by disaster, direct economic loss due to disasters, damage to critical infrastructures while increasing the number of countries with disaster risk reduction strategies and improving international cooperation with countries; as well as access by populations to multi-risk rapid warning systems and information and assessments concerning disaster risks.

The Sendai Framework in Africa

The Tunis Declaration on accelerating the implementation of the Sendai Framework and the African Regional Strategy for Disaster Risk Reduction (DRR) is committed to strengthening political action in favour of DRR; improving the identification and assessment of disaster risks and the governance of the institutions concerned; raising public awareness of DRR and integrating it into emergency response management. In Africa, for the 28th extraordinary summit that took place in Addis Ababa in January 2017, the Heads of State and government of the African Union (AU) adopted an action programme to implement the Sendai Framework in Africa. In 2022, as part of the Sustainable Development Goals and Agenda 2063 of the African Union, a dedicated humanitarian agency was also created. With USD 140 million in African funds,[1] its goal is «to create a set of solutions in line with local realities and specific to each crisis, such as the hotspots of the Horn of Africa and the Sahel. The Agency must be able to take part in anticipation and preparation work to reduce and contain the emergence of new crises in order to move from a state of reaction to one of prevention and development», stresses Mabingué Ngom, special advisor to the Executive Director of the United Nations Population Fund (UNFPA). The total cost of carrying out this mandate is estimated at USD 14 billion to prevent risks such as drought and floods, to improve the reconstruction of damaged areas or protection of vulnerable people.

In January 2021, at the One Planet Summit, which brought together several international decision-makers to identify and accelerate transformational initiatives and the financing of climate solutions, the heads of state present announced an additional USD 14 billion for Sahel countries by 2025.

The Sendai Framework aims to substantially reduce losses and risks linked to disaster.

1. Mabingué Ngom, «AU: an African humanitarian agency, a chance for women and young people», Jeune Afrique, 08/2022

The French Development Agency (AFD) has already invested over EUR 5.2 billion in planning projects in 44 countries in the region, and particularly in the "Great Green Wall" from Dakar to Djibouti which should be developed by the end of the decade. It aims to respond to climate issues and to the deterioration of ecosystems in order to reduce flood risks, guarantee food security and respond to chronic unemployment in the countries through which it passes by creating 350,000 jobs.

The Sendai Framework in the Arab world

The "Abu Dhabi 2023" summit, bringing together experts and heads of national, regional and global entities concerned by managing emergencies and crises, aimed to create an international platform to strengthen partnerships and cooperation, share experiences and discuss critical global challenges and trends. It highlights global best practice in the field and in terms of foresight and assessment of future risks. It resulted in the signature of a memorandum of agreement on civil security between Mauritania and the United Arab Emirates.

The Sendai Framework in South-East Asia

In South-East Asia, the regional mechanism supported by the Association of Southeast Asian Nations (ASEAN): Agreement on Disaster Management and Emergency Response (AADMER) stepped up its ambitions in the 2021-2025 plan, with the aim of accelerating resilience in the face of increasingly devastating crises.

The AADMER is implemented through five priority programmes:

- Risk assessment and monitoring
- Prevention and mitigation
- Preparedness and response
- Resilient recovery
- Global leadership

In particular, this initiative aims to strengthen cross-sectoral collaboration with other ASEAN bodies and relevant partners on social inclusion, risk assessment and risk communication, among others, while maintaining a more sustainable and more resilient ASEAN community. A web-based monitoring and assessment system will enable the ASEAN Committee on Disaster Management to systemically track implementation progress and the achievement of results.

INDONESIA

Disaster prevention and preparedness requires the inclusion of the most marginalised and under-represented communities, which are often more affected in the long term. "UNDP's DX4Resilience project in Indonesia, supported by the Government of Japan, aims to address this issue by collaborating with persons with disabilities and developing a digital platform for disaster risk assessment using high-quality data that considers disability, sex, age, socio-economic status, and other important identity factors. This approach facilitates a better understanding and effective management of disaster risk", explains Ronald Jackson, Head of the Disaster Risk Reduction and Recovery for Building Resilience Team, UNDP.

⬢ *The Sendai Framework in Latin America*

With over 1,200 natural disasters since the start of the 21st century, in 2020 the UN ranked Latin America as the second most exposed region to extreme events. The European Union shared the experience of its civil protection mechanism during the 2017 fires in Peru and the 2019 fires in Bolivia, a country which also hosted an EU environmental expert within the framework of the Capacity for Disaster Reduction Initiative programme.[2]

Economic cooperation with China has been extended through the first joint action plan, which provides for the deployment of "cooperation mechanisms for managing emergency situations and promoting exchanges on prevention."[3]

2. «European Civil Protection and Humanitarian Aid Operations: South America», European commission Website.

3. Plan de acción conjunto de cooperación en áreas claves China-CELAC (2022-2024)», Ministry of Foreign Affairs of the People's Republic of China, 13 December 2021.

ARGENTINA

In 2021, the partnership between the French département of Vienne and the Province of Jujuy, in the north-east of Argentina, was selected by the Agence Française de Développement (AFD), within the context of the FICOL (Funding Facility of Local Authorities) financing procedure. The project, scheduled to run until 2024, covers four areas: crisis management, fighting forest fires, emergency interventions on vehicles, out-of-hospital and in-hospital management of medical assistance. The goal is to qualify firefighters in Jujuy to deal with a large-scale disaster.[5] In 2019, the Airbus foundation supplied an aircraft occupied by 38 civil security military rescue workers to take part in firefighting in the region of Santa Cruz with the Bolivian authorities. This aircraft also transported materials and nearly two tonnes of firefighting equipment from national civil security resources. Experts from the French interior ministry were also present within a European civil protection team, in charge of coordinating teams in the field. France also supplied Bolivia with four civil security military rescue worker drone pilots and three drones to carry out reconnaissance missions and locate the fires, as well as a firefighter with expertise in aerial investigation.[6]

5. https://www.departements.fr/wp-content/uploads/2022/11/RAPPORT-AFD_-DF_SECURITE-CIVILE-COOPERATION-DECENTRALISEE-PRINT.pdf

6. https://www.latribune.fr/entreprises-finance/industrie/energie-environnement/sept-pays-d-amerique-du-sud-s-engagent-a-proteger-l-amazonie-827448.html

Cooperation in Europe

Crisis management and response mechanisms in the event of extreme climate events exist to aid the population, secure the area and act accordingly.

The EU Civil Protection Mechanism (UCPM)

The EU Civil Protection Mechanism is one of the tools most used to respond to a natural or technological disaster: over 600 times in 20 years, including one hundred times in 2020 alone, after the Beirut (Lebanon) port explosion in August, floods in Ukraine, Niger and Sudan, etc. It was recently reinforced. "One of the essential elements of our ability to deal with crises is the solidarity shown by Member States. With the Russian aggression against Ukraine, we observe unity and solidarity between the EU Member States that are helping Ukraine. We have learnt that this union and solidarity are essential to successfully rise to this type of challenge", says European Commissioner Janez Lenarčič.
The EU's civil protection mechanism should see new actions emerge to adapt the systems to extreme weather events.

These include:

- investing in research and innovation;
- developing suitable prevention and preparedness actions;
- developing civil protection capabilities;
- improving the preparedness of citizens by providing more information;
- encouraging citizens and volunteers to take part in initiatives in the field of civil protection.

The EU is investing in natural risk control with its European Green Deal. The Commission has pledged EUR 1,000 billion to sustainable investments. Its green transition will be financed by 30% of the regional multi-annual budget (2021-2028) and some of the EUR 750 billion of the Next Generation EU recovery plan.
"In the course of 2024, Nîmes in France will become the first European civil protection hub. The pilot project, Nemausus, aims to lay the first stone of this edifice: the creation of a Euro-Mediterranean centre of expertise on forest fires (huB.46). Technology, at the service of civil security forces, will necessarily be part of creating resilience in populations on a national and European scale", explains Captain Laurent Alfonso, Firefighter Officer and European Affairs Officer in the Directorate General of Civil Security and Crisis Management, national civil protection expert seconded to the Union for the Mediterranean.

As part of the UCPM, on 29 February 2024, the European Union and the World Bank launched the Technical Assistance Financing Facility for Disaster Prevention and Preparedness (TAFF). Targeting national civil protection authorities, initially for a three-year pilot phase, it aims to enhance disaster prevention and preparedness in the EU and beyond. With initial funding of EUR 6 million in 2024, it will support projects, studies and training in disaster and climate resilience. It also promotes the sharing of knowledge among countries on disaster risk management. The World Bank will implement the activities with financing provided by the European Commission.

Although current efforts at European level are undeniable and effective, "the context of climate change requires us to constantly optimise our procedures for deploying our response capabilities, but also in terms of prevention and preparedness for crisis situations. It's a learning process. We experimented with «pre-positioning» in 2022 and 2023. Six member countries (Bulgaria, Finland, France, Germany, Norway and Romania) sent over 200 European firefighters to Greece during periods of vulnerability. In anticipation. This could be generalised and systematised, particularly by including airborne resources. In the future, the Member States will also be able to discuss increasing the EU's powers in the area of civil protection. For the moment, this remains a national competence. The debate has begun. But we still have a lot of room for manoeuvre in European collaboration and cooperation", adds Captain Alfonso.

The European RescEU reserve

Sometimes, this solidarity and flexibility are not enough. This is why the RescEU reserve was set up. Its aim is to protect citizens from disasters and manage new risks. RescEU is a reserve of European capabilities, fully funded by the EU. It "can provide medicines and medical items, CBRN countermeasures (detection and decontamination), transport and logistics assets, accommodation, in particular emergency shelters, and we are also building emergency energy sources, mainly generators. We have also decided to double the capacity of RescEU's fleet of firefighting aircraft. This emergency reserve is often mobilised when several Member States are affected by crises", notes European Commissioner, Lenarčič. "Twelve new aircraft should be operational in 2029. Two planes will be stationed in Portugal, two in Spain, and the same in France (from 2026), Italy, Croatia and Greece." Captain Alfonso adds: "RescEU is only the final step in terms of capability response. A considerable effort is being made upstream to improve early warning, analysis and risk assessment systems.

European border projects

The ALARM and PACTESUR invited Belgian and French civil security forces to discuss the common risks they face on their shared borders: industrial installations (Seveso plants) posing major risks of accident, marshalling yards receiving hazardous materials, major rail and road routes, nuclear power stations (Graveline and Chooz), natural hazards (floods, landslides and underground cavities).
The first step is to coordinate efforts while respecting the prerogatives of each level of governance. Although European experience shows that resources are mobilised gradually, from local to supra-local (province, department, region) to national level in the event of a major crisis, ALARM has also highlighted the need to act at international level, particularly cross-border, in view of the shared risks.
The project was based on a regular commitment from Belgian and French rescue resources, i.e. the ability to provide mutual assistance in cross-border areas, and the development of a culture of partnership between the services of both countries. French Emergency Medical Service (SAMU) teams and Mobile Emergency and Resuscitation Service (SMUR) teams intervene to support their Belgian colleagues. Each intervention that has led to cross-border cooperation is assessed and feedback provided in order to adjust, modify or confirm the intervention methods.
French and Belgian firefighters regularly carry out joint exercises and training.
The ALARM project contributed to the development of a cross-border risk analysis and coverage plan (STACR in French).

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The European Response Coordination Centre (ERCC)

The EU's ERCC is in permanent contact with the national civil protection authorities and ensures the rapid deployment of assistance if a disaster occurs outside the European area.

IPCR - Integrated Political Crisis Response mechanism

The IPCR supports rapid and coordinated decision-making by the EU for major crises via tools to make information sharing easier, facilitate collaboration and coordinate crisis response at the political level:

- a crisis meeting chaired by the rotating Presidency with key stakeholders;
- analytical reports to provide decision-makers with a clear picture of the current situation;
- a web platform to exchange and collect information;
- and a 24/7 contact point to ensure constant liaison between the stakeholders.

The large-scale European civil security exercise DOMINO took place in 2022 in Marseille to improve preparedness of first responders in an emergency.
It brought together over 1,000 members from the rescue forces of Germany, Belgium, Austria, Spain and France. Staff trained for a series of natural, chemical and terrorist disasters. This exercise allowed every participant to test the mobilisation of their human and material resources and the implementation of their crisis management plans as part of a coordinated inter-service approach.

Cooperation is also emerging in the field of reconstruction." In Ukraine, strong partnerships have been forged through the medical aid committee, which in particular provides psychological support in the field. We have also initiated training cooperation with a university and the association of European psychologists and firefighters," says Marie-Thérèse Neuilly, French specialist in crisis management and prevention, and on psycho-social aspects in post-emergency situations, and Doctor of Sociology. She adds, We work on the ground because prevention has failed. It is up to us to help stabilise the situation with a system of values. This micro-social dimension will become increasingly important. We will therefore have to build it into the macro-social dimension of crisis management and step up the means to respond to the increase in psycho-trauma."

The European Union's cyber posture

The cyber crisis is a new component of European crisis management. In conclusions approved in May 2022, the European Council reasserted the need for regular exchanges on the cyber threat landscape in the relevant structures within the Council, regular engagement with the private sector, impact and severity assessments of incidents, awareness-raising actions and preparation for further applications of the EU's "cyber diplomacy toolbox."
The European Council noted that the cyber posture will be a step towards establishing a European doctrine for action in cyberspace, founded on resilience, enhanced response capabilities and options, as well as a common position on the application of international law in cyberspace. The NIS 2 (Network and Information Security) directive, due to come into force by October 2024, will help to enhance resilience and response capabilities to incidents in the EU. It will be completed by the Cyber Resilience Act which aims to improve IoT security.

The establishment of clear methodologies, to the benefit of every State

The Global Facility for Disaster Reduction and Recovery proposes the Global Rapid post-disaster Damage Estimation (GRADE) approach

Since 2018, the World Bank, the Disaster-Resilience Analytics and Solutions Team (D-RAS) and the Global Facility for Disaster Reduction and Recovery have proposed the Global Rapid post-disaster Damage Estimation (GRADE) approach, which provides for a post-disaster damage analysis so that we can learn from them and develop clear methodologies. Deployed in Türkiye and Syria after their earthquakes in 2023, the GRADE approach provided a rapid preliminary assessment of the direct physical damage, informing the appropriate, timely and effective measures to be taken, and allowing resources to be prioritised where they were most needed. According to Munich Re, losses due to natural disasters were estimated at USD 110 billion in the first half of 2023, with the earthquake in Türkiye and Syria contributing most to the losses. "It is essential to have common guidelines to continue to prepare and work together to manage crises, which are likely to multiply, involving more and more players from different backgrounds. Sharing information and data will be a process to develop and reinforce to contribute to our collective efficiency", adds Ludovic Faytre, referent for major risks / development at the Institut Paris Region.

OVERVIEW OF INITIATIVES / EXAMPLES IN EUROPEAN COUNTRIES

Reinforced national and European cooperation

France

Local and regional authorities are key players in crisis management. "Awareness of exposure to vulnerabilities is essential in order to deal with them. This involves accepting these risks and incorporating them into public policy. Then, there are the resources to implement and to deploy in response. The first step towards resilience is to accept the fact of our collective and individual vulnerabilities", explains Ludovic Faytre from the Institut Paris Region. This area-focused approach must be based on three phases: "prevention, the time of the crisis and its preparation, and the post-crisis period. This last part must include social, economic and reconstruction parameters", he adds.
Another lever for action is the inter-ministerial crisis management operational centre (COGIC), placed under the authority of the Ministry of the Interior, which «analyses and manages natural and technological disasters, provides information feedback and interfaces with the operational centres of other ministries..[7] It also allows the deployment of rescue workers abroad, such as in February 2023 in Madagascar, where 60 civil security professionals came to the aid of the local population in the wake of cyclone Batsirai.
Finally, France has «resources that provide a network of forces and strategic equipment reserves across mainland France and its overseas territories. In addition to territorial emergency services, three civil protection training and intervention units (UIISC) complete the emergency response system, i.e. 1,402 military-trained civil security rescue workers (FORMISC), capable of integrating into all local or international operational systems and intervening across the whole spectrum of crises», explains the Directorate General for Civil Security and Crisis Management. There will be a fourth UIISC from summer 2024. Based in Libourne, a strategic choice after the large forest fires in Nouvelle-Aquitaine in 2022, the new unit will host 580 additional military personnel.

Portugal

The Portuguese civil protection system operates at many levels, with responsibilities at national, district and local level, meaning that it can take local specificities into account. However, the structure depends on the availability of regional resources and capabilities and, consequently, the actual status of disaster risk management measures varies according to the local context.

7. Centre opérationnel de gestion interministérielle des crises (COGIC), 2018, ministère de l'Intérieur

Coordination between stakeholders and the levels of governance is one of the main strengths of this system. Training mayors is a noteworthy procedure.
The "Portugal Chama" ("Portugal Calls") awareness campaign encourages individual responsibility in order to increase the area's resilience to fire. In 2021, the "Safe Village" and «Safe People» programmes, promoted jointly with municipalities and parishes, led to the implementation of measures to protect people, property and buildings in the town-forest interface, and public awareness-raising campaigns on risk behaviour and self-protection measures. Over 2,000 villages were concerned, 1,900 local security agents appointed and over 800 evacuation plans prepared. As part of a public awareness-raising campaign and the process of modernising the warning system, an SMS notification system was developed in collaboration with mobile operators. In the context of rural fire risk, on 15 August 2021, 2.5 million SMS were sent to people in areas at extreme risk.[8]

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Spain

Spain has very good operational capabilities, particularly in response to forest fires, with a fleet of Canadair-type aerial firefighting aircraft.

A simple concept lies at the heart of the civil protection doctrine: when dealing with emergencies, only one body can be in charge. When an emergency occurs in a region, the authority that manages the region is responsible for responding. There are three levels: local/municipal, provincial/autonomous communities, state/national. Each level has its own response capacities and must be resilient on its own scale. For example, each municipality has firefighting brigades, local police, etc.
If the capacities engaged are insufficient, then the next level is activated: firefighters, intervention capacities, sanitary and rescue equipment, psychological support, etc. In particular, Spain has the Emergency Military Unit, which depends on the Ministry of Defence and is also at the service of the entire civil protection system.
This Emergency Military Unit provides backup for the autonomous communities if required. Spain has very good operational capabilities, particularly in response to forest fires, with a fleet of Canadair-type aerial firefighting aircraft.

8. Rapport Forest Fires in Europe, Middle East and North Africa 2021 de la Commission européenne.

Romania

Romania has a solid legislative base covering all the phases of the disaster management cycle. The vast and well-structured national disaster risk reduction platform (NPDRR) has facilitated exchanges between the main players and has already produced valuable results.
A global process aimed at improving the systematisation, consistency and the cross-sectoral nature of national policies and strategies is in progress.
For each type of hazard, a lead authority is identified. Early warning systems for specific sectors are used to address different types of risk. For example, during an earthquake, the General Inspectorate for Emergency Situations, critical infrastructure operators and some users can be warned in advance, within 20 to 40 seconds. The risk of earthquakes and floods in Romania is one of the highest in Europe.
With the help of the European Investment Bank and the European Commission, the country has been able to enhance its preparedness for disaster risks thanks to an investment of EUR 678 million to create training centres and modern equipment, which will reduce the response time of firefighters by at least 10%.
The RO-RISK project, the main objective of which is to facilitate the exchange of data and information, and cooperation between Romanian authorities responsible for risk management, has enabled assessments to be carried out for 10 major hazards in partnership with 13 research institutes, universities and authorities.
The existence of operational centres for emergency situations, with permanent presence within different ministries, is a good example of collaboration of the technical capabilities within national government structures. The importance of political consistency between disaster risk reduction, adaptation to climate change and sustainable development goals is acknowledged by the National Disaster Risk Reduction Strategy (NDRRS) and the National Strategy on Adaptation to Climate change (NSACC) 2022-2030. The public warning system by cellular broadcast (RO-ALERT) has been used successfully in recent years to warn and inform the population of forecast or actual major specific risk scenarios. Several national awareness-raising campaign have been implemented for a variety of topics, and efforts are being made to bring them closer to citizens through successful public-private partnerships (for example, "Be Prepared Caravan", "Mobile Centre for Preparedness") and collaborations with civil society and NGOs.

Strengthening international law and international standards concerning crisis management will undoubtedly promote cooperation between States and international players.

Precise European legal and regulatory frameworks

The various stakeholders must work within precise legal frameworks, which must either be created or adapted. In concrete terms, assistance in a neighbouring country must be provided on a contractual and regulatory basis.

The EU Critical Entities Resilience Directive

Adopted by the European Commission on 8 December 2022, it covers all natural or human risks (natural disasters, incidents, terrorism, internal threats, public health emergencies, etc.), likely to affect the supply of essential services. Its scope includes the following sectors: energy, transport, banks, financial market, health, drinking and wastewater, digital infrastructure, some public administrations and space. The text makes it mandatory for public authorities and businesses to have a resilience strategy to identify and prepare for risk, on pain of financial penalty. The Member States must have a national strategy to list the critical entities that provide essential services, strengthen their resilience and carry out a risk assessment every four years.
Critical entities are subject to an obligation to detect risks that could significantly disrupt the provision of essential services and must take appropriate measures to ensure their resilience, as well as inform the relevant authorities of disruptive incidents. It is up to the Member States to ensure that national authorities have the authority and the means to carry out on-site inspections and to apply penalties in the event of non-compliance.

The legislation that came into force in 2024 gives the European Commission a stronger role in supporting and coordinating these areas, and encourages cooperation between Member States and with neighbouring countries. The EU is cooperating with NATO in this area.

The Member States must have a national strategy to list the critical entities that provide essential services, strengthen their resilience and carry out a risk assessment every four years.

Disseminate a culture of risk and resilience: empower, coordinate and cooperate at the national level

The European risk management and civil protection project, RiskPACC, led by the German research institute, Fraunhofer, aims to improve coordination between citizens and civil protection in the event of a crisis. It works on seven use cases.

1. ATTICA, GREECE
Risk awareness and response
2. BRUSSELS, BELGIUM
Assess the impact of information campaigns in schools
3. THE REGIONS OF OLOMOUC AND DE MORAVIA-SILESIA (CZECHIA AND POLAND)
Comparison of knowledge and capabilities related to CBRN risk
4. EILAT, ISRAEL
Preparation of volunteers
5. MUNICIPALITY OF PADOVA, ITALY
New civil protection instruments to deal with climate risk
6. LANCASHIRE CONSTABULARY, GREAT BRITAIN
Examine the benefits and challenges linked to the use of social media in the context of disaster risk management
7. GLOBAL
Management and monitoring of a pandemic: use and acceptance of monitoring technologies worldwide

Finnish resilience focused on empowerment and cooperation

Finnish defence forces have organised defence lessons nationally for over 60 years, giving civilian and military personnel an overview of Finland's foreign, security and defence policy, the preparedness and development of the various sectors of national defence; and the rest of society in peacetime crises and conflicts. The lessons in defence further understanding of global security, resilience, national legislation and decision-making processes. These lessons also improve cooperation between various sectors of society and government institutions. In recent decades, the emergency supply bases have shifted from stockpiling goods to ensuring the continuity of essential services.

The Finnish emergency supply rests on two key elements: the emergency supply fund and a vast network of public and private entities working on matters related to preparedness and service continuity. In terms of preparation, the 72-hour concept details the recommended level of home preparedness. «Households should be able to survive three days in the event of disruption. They should store at least three days of food supplies and medication. They should also know the basics of preparedness: where to get reliable information in the event of disruption and how to deal with a residence that is getting increasingly cold. Everyone should be ready for disruptions and emergencies», testified several Finnish people at the Finnish embassy in London. Finland has received just over EUR 2 billion in subsidies under the Recovery and Resilience Facility (RRF) until 2026.

In France, Communal Civil Security Reserves are formed of volunteers capable of offering support in their field to professionals: nurses, radio technicians, electricians, plumbers, carpenters to set up reception facilities, evacuate debris and isolate partially destroyed homes, etc. However, the intervention of these volunteers must be legitimised, they need to be trained and their field of intervention clarified within the systems put in place by the authorities. It is also interesting to note that they can be an incubator for future recruits for the emergency services.

Expansion of public-private partnerships

A Franco-Australian research partnership

The Australian-French Association for Research and Innovation (AFRAN) has created a working group to fight fire: the French-Australian Bushfire and natural hazards community. AFRAN, created following devastating fires in 2019 and 2020, is a space for sharing and exchanging on scientific progress, new technologies for preventing, forecasting and fighting fires and natural disasters, as well as on practices dedicated to environmental resilience, resistance of infrastructures and the restoration of affected areas. Since 2022, a joint doctorate programme between the Royal Melbourne Institute of Technology (RMIT) and the University of Corsica has addressed the modelling of the evolution of fires by including the latest advances in satellite imagery and drones, both for surveillance and knowledge of the terrain. It is also an opportunity to discover the technological innovations supported by both States, such as the Australian bush fire simulators, which are the most advanced in the world.

European project for a common emergency number and easier access to information for the population

The interoperability of tools is essential in order to be effective and meet the mobility challenges of our society, particularly warning systems. The combination of PEMEA and NG112 standards aims to meet this specific need. «The fact of having two solutions makes it possible to create shared and scalable multimedia services, in agreement with telephone network operators and the communication approaches of Internet service providers. This generalises all forms of communication, responding to public requirements, particularly those of people on the move across Europe using different languages, and communities such as the deaf and hearing impaired», stresses Bertrand Casse, member of the PEMEA consortium. Following the European projects Soteria and Nexes, the international company Chapsvision CYBERGOV developed GHALE, an emergency call routing platform. The first market solution complying with the new PEMEA standard, it offers the possibility for any application to be able to access the nearest 112 emergency call centre and share vital data. It allows users to be easily located in the event of an emergency, and for people with speaking or hearing difficulties to communicate with the services using specific tools and technologies.
The Galileo constellation enables, at the request of the Member States, the broadcasting of short messages on all compatible media, including mobile telephones, geolocated within a given geographic area.

Spain has developed a national alert network which collects all basic information required in the event of an emergency in a single application. This means that all the authorities with information on various risks can contribute to it.

Three-party partnerships in Spain: public-private-academic

Spain has developed a national alert network which collects all basic information required in the event of an emergency in a single application. This means that all the authorities with information on various risks can contribute to it.
The Spanish national civil protection academy works with technological companies and universities. In particular, this has led to the creation of chairs dedicated to risk analysis, risk management or psychological support for intervention teams.

OVERVIEW OF INITIATIVES / EXAMPLES IN ASIA AND OCEANIA

Improving skills at every level, from planning to the field, to build stronger communities for crisis management

The Philippines

Following typhoon Rai in 2021, the Philippines invested in a prevention programme to train nearly 1,000 officials from 17 regions including governors, mayors, disaster risk management officers and budget civil servants.

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Japan

At the intersection of four tectonic plates, Japan is particularly vulnerable to earthquakes. The one in 2011, of magnitude 9.1, caused a tsunami leading to the Fukushima nuclear disaster. Responsible for the death of over 18,000 people, this disaster is not an isolated case. The most recent earthquake was on 1 January 2024. Measuring 7.5 on the Richter scale, it hit the region of Ishikawa, where 1.2 million people live. It killed fewer than 80 people. The level of preparedness of the Japanese explains this outcome, which could have been more catastrophic. By way of comparison, in 1923 an earthquake of magnitude 7.9 struck the country, resulting in the death of 110,000 people. Japan is developing a principle of self-organisation. Citizens are encouraged to be ready by building up provisions of food, water and other supplies, drafting safety action plans and taking part in preparation exercises in the community, school and workplace. In the event of a disaster, local communities are very supportive. Resources are identified and mobilised by local authorities without waiting for external aid. Early warning and information dissemination systems ensure that citizens are quickly informed of imminent danger, which gives them the opportunity to take measures for their own safety.

Citizens are encouraged to be ready by building up provisions of food, water and other supplies, drafting safety action plans and taking part in preparation exercises in the community, school and workplace.

Today, the entire population is made aware and disaster education is provided from nursery until higher education. A national disaster prevention day was introduced on 1 September.
When the most recent earthquake hit, the public's response to warnings made it possible to quickly evacuate inhabitants to a safe place. The government has also installed seismometers throughout the country. They forecast and notify potential earthquake impact zones by broadcasting warnings on radio and television.
The Japanese approach is a benchmark. In the event of a crisis, government agencies, including the national fire and disaster management agency, coordinate the response, in close collaboration with the government, the private sector and NGOs. Japan is also working to increase the participation of women in the disaster programming process. Japan is a world leader in this field. "Policy commitments to complex crises in Africa add an extra dimension – and new challenges – to the programme. This commitment will require different tools and greater predictability in the budget earmarked for humanitarian aid in complex emergencies. It must ensure that it has the funding required for these rapidly changing situations", says the OECD.[9]

China

In 2022, China, increasingly vulnerable to climate change, updated its 2035 national climate adaptation strategy. Seventeen ministers are involved in this strategy, which focuses on the State's proactive adaptation to the impact of climate change. Largely focused on food security, it includes measures to optimise agriculture by growing high-yield, stress-resistant crops. By 2025, the country should improve its institutional monitoring mechanisms and early warning systems. Pilot towns will be appointed to test climate risk adaptation technologies. In terms of detection, Chinese researchers have developed artificial intelligence based on deep tech to predict the evolution and characteristics of El Niño, a climate phenomenon with extreme consequences in the Central Pacific. Using convolutional neural network technology, researchers at the Institute of Atmospheric Physics of the Chinese Academy of Sciences have developed a learning model designed to predict the spatial pattern of sea surface temperature anomalies, particularly in the equatorial Pacific. The research team plans to further exploit the power of this technology to extend it to seasonal climate forecasts and provide earlier and precise alerts in the event of dangerous weather events.
Finally, Beijing's strategy is based on the need to strengthen the resilience of infrastructure, particularly railway lines which are highly vulnerable to heavy rain, flooding and landslides. The cost of these weather events could amount to USD 3.53 billion per year if the world warmed by 3°C, a cost solely for the railways. The Tibet-Sichuan line, currently being built, underwent an assessment of the climate risks on its path before construction began. However, lack of available data for the region prevents a precise evaluation. Researchers therefore recommend the use of detailed modelling of climate scenarios and resilience tests before starting to build new infrastructures that could be vulnerable. In addition, for the Tibet-Sichuan line, the installation of weather stations would allow precious data to be collected for adaptation to potential future risks.

9. https://www.oecd.org/fr/cad/examens-pairs/Part%201%20FRE.pdf

Expansion of public-private partnerships

Australia

In Australia, the development of partnerships between the government, businesses, volunteers and not-for-profit organisations is encouraged by the National Strategy for Disaster Resilience to promote resilience of the communities. At national level, the Trusted Information Sharing Network (TISN) for Critical Infrastructure Resilience public-private partnership provides a framework for sharing information on the security and continuity of critical infrastructure.
The Australian system gives States and local authorities important responsibilities. The Queensland strategic framework and disaster management plan encourage the coordination and integration of the private sectors and associations, as well as the reinforcement of resilience locally, but do not specifically define the roles of the private sector as is the case for government agencies.

At national level, the Trusted Information Sharing Network (TISN) for Critical Infrastructure Resilience public-private partnership provides a framework for sharing information on the security and continuity of critical infrastructure.

China

The international engineering and geomatics group WSP was appointed by the authorities to analyse flood risk for four counties in the municipality of Chongqing in southwest China. This project, funded by the World Bank, aimed to reduce flood risk in Chongqing by strengthening the sanitation system thanks to technical and non-technical measures. The project involved building dykes to protect against flooding and the installation of drainage and a dam in an urban environment, as well as non-technical measures such as analysing flood risk, the additional purchase of flood control equipment, updating the flood control emergency plan, training in flood control exercises, etc. Among these initiatives, drawing up a flood risk map is one of the key measures to reduce dangers in the towns and villages in the zone concerned by the project. The computer-aided flood risk management system platform is developed on the basis of hydrological and hydro-dynamic models. It allows relevant data to be stored, flood threat to be viewed, early warnings to be issued, and the repercussions of flood risk to be assessed and notified. This project also enabled the owner to be trained on the platform to be able to use it independently to manage flood risk.

Expansion of public-private partnerships

Tanzania

With 4.1 million inhabitants, Dar es Salaam is set to become a megalopolis by 2030. In addition to unplanned and informal settlements and a highly variable climate, the very high population growth contributes to a high flood risk. Institutions had limited technical capacities in terms of skills, training and equipment, not to mention a lack of access to geospatial information and shortcomings in data analysis.

A consortium of local universities and NGOs, working with the Tanzania Commission for Science and Technology, the Tanzanian Red Cross, the World Bank and members of the community, set up Ramani Huria in 2015. This community risk mapping project in Dar es Salaam generates vast quantities of geospatial information and data to draw up governance and risk reduction plans: land use, infrastructure and risk exposure. The maps, generated collaboratively between students and members of the community, support the development of an ex-ante plan for declaring an emergency, taking action and defining roles and responsibilities in the event of a disaster. This takes place via the multi-agency emergency intervention team of Dar es Salaam. At community level, maps provide information on actions related to pipe cleaning programmes and evacuation planning.

A community risk mapping project in Dar es Salaam, Ramadi Huria generates vast quantities of geospatial information and data to draw up governance and risk reduction plans.

OVERVIEW OF INITIATIVES / EXAMPLES IN LATIN AMERICA AND NORTH AMERICA

Chile

Chilean authorities are investing in and reforming their organisation. The national disaster prevention and response service (Seared) was inaugurated in 2023. The aim is to decentralise crisis and risk management. Senapred also wants to step up work in terms of prevention, planning, organisation and supervision.

United States

In the United States, the continuity of government operations in the face of crises is organised by the Federal Emergency Management Agency (FEMA). The agency's 2022-2026 strategic plan rests on three goals:

- instil equity as a foundation of emergency management by simplifying the individual aid request process. This has allowed over 100,000 additional survivors to have access to aid. The total amount of aid is evaluated at USD 600 million. FEMA has simplified its individual aid request process and enabled over 100,000 survivors to receive aid to which they were not previously entitled. An additional USD 600 million has thus been paid out. FEMA has also pledged to direct 40% of the profits from pre-disaster subsidy programmes to underserved communities.
- lead the whole of community in climate resilience. FEMA invests USD 6.8 billion in community-wide mitigation measures to reduce suffering and avoid future costs of climate change-related disasters.
- improve its preparedness, measure and strengthen its capabilities to meet current and emerging needs. FEMA is increasing the capacity of its national response coordination centre and has launched the Emergency Manager Exchange Program. This programme aims to allow States, local authorities, tribes and territories to work with FEMA to develop and implement dedicated policies and programmes.

Aiming to decentralise crisis and risk management. Senapred (in Chile) also wants to step up work in terms of prevention, planning, organisation and supervision.

With extreme climate events in the country multiplying, the use of new technologies to deal with them is a natural choice. The United States Geological Survey has teamed up with the Australian company Q-CTRL to study the use of quantum computing in the early detection of natural disasters and the monitoring of climate change. The application of quantum computing to certain geophysical challenges would make it possible to access information in critical fields such as underground water resources management, monitoring the ice cap and discovering and using energy and mineral resources. Beyond the research carried out to improve detection, the United States is also developing solutions to minimise the effects of crises. Drones are increasingly used to assess damage and to deliver supplies in areas that are the most difficult to access. Finally, security forces are testing a new tool, the goTenna Pro X2 radio, which allows two users to exchange text or location data, even if the satellites or network are out of service. Forming a connectivity bubble, several Pro X2 radios can be connected to one another, covering tens of thousands of square kilometres. This is essential technology because the forces' telecommunications equipment is not necessarily interoperable.

The United States Geological Survey has teamed up with the Australian company Q-CTRL to study the use of quantum computing in the early detection of natural disasters and the monitoring of climate change.

Drones are increasingly used to assess damage and to deliver supplies in areas that are the most difficult to access.

GLOBAL APPROACH: FUNDING BETWEEN INSUFFICIENCY AND REFORM

Behind the social and societal issues of adapting to new risks, there is a budgetary issue at play. According to the Institute for Climate Recovery, at least an additional EUR 2.3 billion per year may be mobilised. The European Commission, for its part, proposes a budget increase of EUR 75 billion until 2027. The proposal was validated by European deputies in October 2023, with EUR 5 billion allocated to strengthening EU capacities to deal with unforeseen crises.

Joe Biden is requesting over USD 105 billion to respond to international global crises for the United States alone.

The UN, whose missions and interventions are constantly growing in view of the multiplication of crises, has a stagnating annual budget of USD 300 million. "The need for humanitarian aid for populations in need is skyrocketing. Inflation is putting a strain on our budget", declared Gilles Michaud, UN Under-Secretary-General for Safety and Security. Also, for several months, the UN has been approaching potential donor countries to call for special contributions to strengthen its teams, modernise its technological tools and create a rapid response unit that can move quickly to the world's most at-risk areas and enable UN teams to intervene more effectively. For the time being, support from Member States does not meet the challenges, whereas the UN spent nearly USD 52 million in humanitarian aid in 2023. "But any humanitarian programme cannot be carried out without security. If it is no longer guaranteed, humanitarian aid risks coming to a standstill", fears Gilles Michaud.

The need for humanitarian aid for populations in need is skyrocketing. Inflation is putting a strain on our budget.

"Despite many innovative financing mechanisms and regulatory advancements, bottlenecks persist in financing the effort required to achieve the risk reduction goals that countries have set for themselves, including those enshrined in the global commitments under the Sendai Framework, the Paris Agreement, Agenda 2030 and other global frameworks. (...) There are still gaps in generating and making accessible risk information, the related tools that are able to generate disaggregated and geospatial data down to the lowest level of analysis, and also in understanding the

vulnerability of human systems to cascading and systemic risk", according to the United Nations International Strategy for Disaster Reduction.
Reform of financial systems is essential – notably those that tie countries into debt mechanisms from which it is difficult to escape, states the United Nations International Strategy for Disaster Reduction. "We must recognize that an international development financing system that allocates approximately 20 times the funding to emergency response, reconstruction, relief and rehabilitation activities rather than prevention and preparedness, acts counter to sustainability principles. And so we must redesign global financing and international development cooperation systems to include proportionate and context-driven solutions commensurate with the disproportionate exposure to environmental and economic risk faced by certain countries International pressure for a fairer, sustainable, equitable planet must materialize mixed and innovative financing approaches, pro-growth tax policies and well-managed domestic resource mobilization that respond to the cascading and interlinked nature of these risks."
While the world continues to face increasingly serious and frequent disasters, the crucial role of the private sector in disaster management has become clearer. The United Nations Office for the Coordination of Humanitarian Affairs (OCHA) and the United Nations Development Programme (UNDP) have jointly launched the Connecting Business (CBi) initiative, which supports both crisis response and development efforts by integrating the involving the private sector. Since 2016, it has raised over USD 50 million for disaster preparedness, response and recovery activities, affecting more than 15.5 million people in 17 countries.

According to the World Bank, developing countries will need USD 140 to 300 billion in 2030 to take measures to adapt to climate change and reduce risks.

CHAPTER 3

Innovation: another cornerstone of a global approach

Harnessing technological progress to improve early detection of crises and data management is crucial. As soon as a crisis occurs, technological resources can enable a faster and more effective response while protecting those involved. Technology can also prove to be an asset in the support stages for victims, and in the reconstruction and resilience processes.

MONITORING AND ANTICIPATING ALERTS

Intelligent platforms

Government bodies and private sector organisations responsible for protecting people and property and responding to natural disasters, extreme weather conditions and other crisis situations need to be able to collect and evaluate different types of heterogeneous data (videos, meters, sounds, texts, etc.) that are now available from thousands of sources, including cameras, sensors, connected devices, the Internet of Things (IoT), social networks, open source data, etc. This data needs to be transformed into information that can help operators make decisions, collaborate with partners, anticipate potential incidents and report on results - quickly, accurately and relevantly.
Several technologies already make this possible. The Smart Digital Platform developed by THALES is a comprehensive, tried and tested solution based on big data analytics, automation, artificial intelligence and machine learning solutions, without compromising on cybersecurity or resilience.

This tool provides real-time situational awareness and analysis, an automatic event detection. It provides decision support to anticipate potential problems or incidents and establish proactive plans. This platform also helps to reduce costs by automating tasks and optimising the allocation of resources in the field.

In France, PUMA-X (standing for Universal Multi-Alert Platform in French) is an innovative project developed by a consortium of seven major players in the safety/security, defence and environment sectors, working to develop a modular, interoperable crisis management platform. Here, its aim is to steer crisis prevention and overall crisis management in a coordinated and optimised way.

Hypervision makes it possible to integrate heterogeneous data, a dynamic PC is coupled with 3D mapping, and the interoperable 3D GIS facilitates the creation of future digital twins of the territory in question. The overall solution is shared in the cloud, with targeted alerts sent to the population and real-time processing of structured and unstructured data for decision support. PUMA-X brings together seven partners: five SMEs (CII TELECOM, JANUA, PRYSM, IGO, J&P GEO), one major group (PREDICT SERVICES) and a research organisation (CÔTE D'AZUR UNIVERSITY - IMREDD).

Technologies based on artificial intelligence could not only enable us to respond better to crises, but above all predict the occurrence of certain crises. Detection is one of the keys to reducing crises and their impact. This is an area in which innovation must be supported.

Canadian start-up BLUEDOT has developed a platform combining artificial and human intelligence to identify signals of emerging global biological threats and classify them. The company was one of the first to raise the alarm about the epidemic threat posed by Covid-19. «This data will also make it possible to identify gaps and better reflect the conditions under which risks accumulate and materialise, in order to inform policy interventions that favour forward-looking and corrective risk management over compensatory risk management. To achieve this, we need high-quality, qualified data that is representative of society as a whole and therefore impartial. This data can then be of great use in anticipating risks and encouraging new thinking and new approaches to development that encourage policy and investment choices that bring about a more sustainable and resilient alternative future,» stresses Ronald Jackson, Head of the Disaster Risk Reduction and Recovery for Building Resilience Team at the UNDP. "We are only at the beginning of what we can do with the power of AI to serve the common good and therefore crisis management. It's amazing to think that a machine can analyse all the forest fires in southern Europe, to gain insight into what will happen depending on the wind and water conditions in another part of the country. Weather forecasting already works on this basis. It can be transposed to many areas to improve crisis management by being a major decision-making tool. This requires safeguards and an essential ethical approach to AI. Humans will always have a role to play. The technology is an aid, a support to help us be more effective", stresses Louis Bernard, Managing Director of CRISOTECH.

AI for training, detection and prevention

The software MASA SWORD and MASA SYNERGY, from the Masa Group, an international leader in modelling and simulation, are designed to simplify and optimise the implementation of artificial intelligence (AI) capabilities to automate and reproduce simulated human behaviour. NATO's Crisis Management and Disaster Response Centre of Excellence uses SYNERGY for military and civilian decision-making training, crisis scenario analysis and research. The technology is also used in some universities to train future quality-safety-environment managers.

In Brazil and Argentina, the risk of landslides requires a major upgrade in detection systems, particularly in terms of GPS inclination and pressure sensors. Another issue is the identification of wildfires in countries crossed by the Amazon. Brazil is investing in satellite imagery and has already chosen the AI developed by OMDENA to help it detect wildfires using 360° cameras. Based on these new uses, preparedness systems could drastically accelerate their modernisation across the continent. EXAVISION, a French company, is also tackling fire prevention. The Nemosys Fire Duo intelligent camera provides image analysis through a continuous 360° scan[1], 24 hours a day. It can measure temperature differences to assess how serious a particular situation is. The camera is equipped with a processing algorithm for real-time detection of hot spots based on configurable thresholds. It has been deployed on a sensitive site on **the shores of the Mediterranean.**

> We are only at the beginning of what we can do with the power of AI to serve the common good and therefore crisis management

The Japanese company SYNSPECTIVE, in partnership with the Japan International Cooperation Agency, has developed a project to use the company's satellites to analyse changes on the Earth's surface and reduce the risk of disasters. SAR (Synthetic Aperture Radar) satellites, which can map areas even at night or during bad weather, have enabled the discovery of three new risk points in **Guatemala** that had never before been identified by the local authorities.
Researchers at the University of **Texas** in Austin have developed a new AI-based technology for predicting earthquakes. After a 7-month trial in China, the algorithm, which achieved an accuracy rate of 70%, detects statistical anomalies in real-time seismic data and historical earthquake records.

1. Applying Deep Learning to Detect Wildfires, Omdena.

In **Switzerland**, the avalanche forecasting department of the Institute for Snow and Avalanche Research of the Swiss Federal Institute for Forest, Snow and Landscape Research also uses AI to assess avalanche risks. Based on snow and weather data, these estimates provide more accurate forecasts of danger zones. Initially designed for dry snow avalanches, since 2023 SLF researchers have been developing digital models based on the same machine learning methods designed for wet snow avalanches and snowpack stability.

The Flood Hub AI, developed by GOOGLE, enables the prediction of water-related natural disasters a week in advance in almost 20 countries around the world.

To do so, it uses satellite images, river hydraulic models and weather forecasts to assess the level of flooding and the areas in which it will occur. This is what FR-Alert does in **France**, except that Flood Hub draws on much larger databases. This free tool is accessible to everyone via a new function integrated into Google Maps and Google Search.

New prospects for research and development in the field of wildfire detection are emerging, particularly in the area of satellite imagery. This could make it possible to automate the identification of outbreaks of fire, using the precision of the images captured by the Pleiades Neo satellites.

In early 2023, the International Atomic Energy Agency (IAEA) completed its support for **Argentina, Chile, Mexico** and **Peru** to develop their own centres of expertise for non-destructive nuclear testing techniques. These solutions will make it possible to identify defects in a structure, whether a road, a building or a bridge, and thus obtain a detailed analysis of the consequences of a disaster.[2]

2. «Latin America, Caribbean Achieves Capability in Using Nuclear Techniques to Respond to Natural Disasters», IAEA, 9 January 2023.

"We need to invest in new technologies and make the most of them. This includes tools for analysing and contextualising the data available today for a 3-5 year view. These would help us to make informed decisions. They would enable us to better plan, mobilise and distribute our resources, but also to adapt our posture in real time" explains Gilles Michaud, Under-Secretary-General for Safety and Security at the United Nations.

COMMUNICATION TOOLS AND CONNECTED WARNING SYSTEMS

Among the actions supported by the **UN**, sophisticated detection and warning systems are a priority to anticipate natural disasters effectively. The UNDP (United Nations Development Programme) has launched the "Strengthening climate information and early warning systems for climate resilient development and adaptation to climate change" programme to support this progressive implementation around the world.

New mobile technologies offer ways of better managing the emergency situations that citizens may face and offering more effective emergency service response (in particular by making it easier to define areas at risk, issue targeted warnings, disseminate information in real time on behaviour to adopt, geolocate people or process requests for assistance). As soon as the alert is raised, the authorities will be able to broadcast, analyse and visualise spatial and temporal information and reduce the human consequences of disasters.

Czech scientists, including PHONEXIA, are developing a chatbot designed to come into service when emergency call services are too congested. The result is a demonstrator of a virtual assistance solution that can be deployed to receive an emergency call if the operators of the 112 and 150 emergency lines run out of capacity. The main advantages are the simplicity, universality and scalability of the assistant in question. The chatbot - or conversational agent -, which is being developed by a team of 38 members from various institutions, will communicate with the caller as if there were a human operator at the other end of the line. It will listen to the caller and, if necessary, ask for the details required by the emergency services. Chatbots are in no way intended to replace emergency operators; they simply serve to increase their capacity when call centres are under too much strain. Chatbots could prove particularly useful in the event of major natural disasters, such as floods and tornadoes.

In **Guatemala**, the Quake Alert warning system is capable of detecting, at an early stage, and automatically reporting, earthquakes on a 360° scope, even when the epicentre lies several hundred kilometres from the sensor's location. Since the first sensor was installed, Quake Alert has detected and reported 100% of earthquakes in the Guatemalan capital.

Peru, Mexico and all the other countries with a high seismic risk could be inspired by this promising technology.

Chile has invested in dedicated sensors, linked to the Sistema de Alerta de Emergencias (SAE) which is mandatory on every telephone to inform the population in real time.[3]

3. «Sistema de Alerta de Emergencias será obligatorio para todos los teléfonos y redes móviles del país», Gobierno de Chile, 2017.

The members of the SAE are organised on a decentralised basis, at community, provincial, regional and national level to produce risk assessments in real time.[4] The deployment of these units makes it possible to shelter populations at risk, in a preventive approach.
The city of Concón in Chile has set up a network of high-quality cameras and other sensors with integrated analysis and loudspeakers, to detect emergencies and send warnings to its population in the event of earthquakes and tidal waves. This system helps the authorities to manage emergency evacuations quickly and efficiently.

In **Uganda**, where 64% of the population makes its living from agriculture, the Strengthening Climate Information and Early Warning Systems (SCIEWS) project has led to the replacement of obsolete and inadequate weather stations with more modern systems, improving disaster risk reduction through more effective means of producing and disseminating information.
In **Burkina Faso, Ghana and Kenya,** the United Nations Environment Programme's (UNEP) Climwarn project has replaced rudimentary meteorological methods with a more sophisticated system using modern technology to alert communities to potential floods and other hazards. This information is then communicated to rural areas by SMS and email, enabling them to better safeguard their crops and livelihoods.

4. «Autoridades oficializan el fin de Onemi: Será reemplazada por Senapred en enero de 2023», T13, 16 November 2022.

INITIAL RESPONSE

As soon as a dramatic event occurs, it is imperative that in initial response is launched with a specialised team to deliver first aid. If this cannot be done by road, airborne resources are essential to reach the inaccessible. The equipment needs to be highly versatile, suitable for rapid projection and immediate deployment by a limited but highly agile team, with lightweight, connected equipment ensuring maximum autonomy.
Throughout the world, AIRBUS HELICOPTERS works alongside public and semi-public bodies to protect people and the environment. Rotary wings provide rapid access to disaster sites to evacuate or transport people or emergency teams and their equipment. To fight fires, the H125 offers unique performance in terms of payload, endurance and manoeuvrability.
Easily reconfigurable, it can be used both as a water bomber and for slinging emergency equipment. The aircraft in the Super Puma family (H215 and H225) have demonstrated their ruggedness and ability to operate

in the harshest conditions. Capable of transporting emergency personnel, they can also be used as water bombers. The H135 and H145 are widely deployed around the world for public service missions including emergency medical transport, rescue and homeland security.

The DIODON HP30 micro-UAV from the French company DIODON Drone Technology is one of a number of UAVs capable of carrying out reconnaissance and surveillance missions in the event of accidents or natural disasters. Its inflatable structure offers it high resistance, and it can therefore take off and land on any uneven terrain. Only one operator is needed to set it up, which increases its deployment speed. More generally, DIODON drones fulfil the needs of reconnaissance, surveillance and detection in the event of accidents or natural disasters. Designed to operate in maritime environments, their robustness and ruggedness make them rapidly operational detection systems for emergency and rescue missions. They enable the point of interest to be located efficiently, so that emergency teams can reduce response times. They can be mobilised for rescue operations at sea, to detect fires and provide assistance, search for people in the event of natural disasters, or help protect the environment.

At European level, when disaster strikes, the COPERNICUS emergency management service is regularly called upon by Member States to assess the damage. It draws on FLAIRFLEET, which provides drone and data analysis services, particularly useful when cloudy weather prevents the collection of good quality images. The aerial images provided by drones are more precise and enable in-depth analysis of landscapes, buildings and ground features.

The Nur drone developed by STREIT GROUP in the United Arab Emirates is an innovative, reusable micro-drone that is revolutionising lighting in search and rescue operations and disaster relief scenarios. Traditional lighting methods are limited and vulnerable to the risk of fire, for example. With its 82,000 lumens of light output, Nur brings unrivalled illumination to disaster-stricken and smoke-filled landscapes.

PROJECTION & MOBILITY

Logistics transport must be able to reach theatres of operation that are nonpermissive or present challenging environments even to highly mobile terrestrial resources, as quickly and as far as possible. This mission can be carried out by cargo aircraft, new-generation airships, transport helicopters and even logistics drones. Projection requires logistical capacities for loading and unloading, standalone energy sources and ground works, ranging from simple stabilisation and crossing to trafficability and earthworks.

TECHNMANN, a French company, has developed the MASSTECH T6 armoured medical vehicle (VOS-MED), enabling medical teams to extract casualties while administering emergency care.

The TERADRONE, a hydrogen-powered airship from the French company WARPA, has a payload that can support the weight of a hospital. Reaching an altitude of 7,000 metres, this all-terrain «cargo drone» has a range of up to 40 days and could revolutionise civil protection in France and abroad.

The French group DAHER has developed a range of all-terrain aircraft, including the Kodiak. The Kodiak can take off and land on short, unprepared runways, a particularly useful feature in the aftermath of a climate disaster when the terrain is sometimes inaccessible. Equipped with floats, it can also take off and land on water. Its robustness and payload mean it can be used for medical evacuations in complete safety.

The TNA from French company UNAC is a machine that prepares and improves airstrips for aircraft landing and take-off. A compact, tracked, air-droppable machine, it opens up access routes for emergency services and moves obstacles over rough terrain.

CONTROL CENTRE, COMMUNICATION NETWORKS, ENERGY, STORAGE & MCO

Communication, fluid and energy networks form mobile integrated assemblies and sub-assemblies that need to be toughened and reliable. Generally in the form of containers or suitable for being held in containers, they house a number of functions: acting as a hertzian communications hub between responders and operators, supplying the camp with electricity and water, and providing storage and monitoring for fleets and personnel. A crisis and management command post is at the centre of the system.

To provide the necessary assistance, even when the infrastructure is degraded and the network saturated, satellite communications systems (Satcom) are favoured by various countries.

Satellite communication systems serve as a relief infrastructure and provide vital communication for emergency responders, relief organisations and the affected communities, while facilitating coordination and information exchange between different response teams and government agencies. Remote sensing provides real-time data and images of the affected areas. This information is crucial for assessing disasters, estimating damage and identifying areas in need of immediate assistance.

There is a real revival of interest in satellite communications, thanks to the high degree of precision in image analysis and interpretation that artificial intelligence brings. Complementarity with drones is also an asset that should be maximised.

Collaborative projects involving secure communications for crisis management are being considered at European level. A consortium led by AIRBUS is working on the Broadway project, which is behind a system that should guarantee the interoperability of exchanges between fire brigades, European police officers, security forces and emergency medical units engaged in cross-border missions. This will enable them to communicate effectively with services in other countries while remaining in contact with their operational hierarchy. «This project, funded by the European Commission, meets a set of specifications drawn up by specialists from eleven countries, drawn from the firefighting, police and gendarmerie services. We have therefore developed an interoperable solution that enables exchanges but guarantees control and security for each organisation. This solution is a complete solution, with terminals, critical communication applications and dedicated accessories that operate on shared or dedicated very high-speed mobile networks,» explains AIRBUS Public Safety and Security (PSS).

ECOSUN INNOVATIONS, a French company, is developing solar generator solutions for mobile production and storage, to replace or hybridise with diesel generators. This enables green energy to be produced in off-grid areas, as well as supporting mobile operations as a replacement for fossil-fuelled generators. To date, more than 100 innovative solutions are in operation around the world (Africa, Europe, Latin America, Middle East, Asia).

ORANGE BUSINESS SERVICES has developed an emergency system using satellite communications to transmit data, voice and images when local infrastructure is inoperable. A genuine emergency telephony tool, it makes it possible to remotely monitor the situation as it develops, and provides connectivity in mobile blackspots or isolated areas.

COMROD France's Tactical Communication Tool (TCT) provides dynamic planning that can adapt quickly to changing operational circumstances, while its sophisticated radio propagation analysis ensures accurate simulation of each communication link. A powerful map reader supports a wide range of geospatial formats, including vector road maps along with several formats for raster maps and satellite imagery.

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CORE-Z5, the first 5G smartphone from the French brand CROSSCALL, is PMR (Private Mobile Radio) compatible with 4G and 5G broadband, guaranteeing the security of data exchanges and communications thanks to flow prioritisation and pre-emption mechanisms. It can be used to view 3D maps or plans, fill in forms, or enter health reports. With optimum image quality, even in low light, as an alternative to a computer in the field, Push-to-Talk compatibility with four programmable buttons, and walkie-talkie 2.0, it makes it easy to communicate and share photos, videos and geolocation simultaneously with several people, over any distance. To cope with noisy environments, the built-in loudspeaker is three times more powerful than average. Its GPS is accurate to within 3 metres, compared with 10 metres for most smartphones on the market.

There is a real revival of interest in satellite communications.

SUBSISTENCE, WATER TREATMENT AND SANITATION

The rapid need for drinking water and food energy is a priority once the emergency phase is over. Conventional food supplies require a variety of prepared products. Like all other resources, they must be self-sufficient, robust and easy to use.
Numerous solutions are being tested to combat water shortages, such as seawater desalination in the Netherlands and Belgium. The arrival of connected technologies and IoT networks is also making it possible to implement intelligent water management to optimise control of resources.

Water treatment units, in portable modules or containers, use ultrafiltration and reverse osmosis to treat any available source and supply water for human consumption at production rates of 40 to 400m3/day. Designed by CEGELEC DEFENSE, they are used by the French Civil Security and Armed Forces.

All over the world, the international charity Water Mission is involved in managing the urgent need for drinking water following natural disasters and in creating infrastructure capable of supplying isolated communities in the long term. In the Bahamas in 2019, Water Mission set up reverse osmosis systems, a special process to remove contaminants from seawater. As a result, the organisation produced nearly 3.8 million litres of drinking water for the country's residents. Other projects designed to secure access to drinking water have been launched in the region. Rainwater recovery and treatment systems have been installed in six schools. Photovoltaic pump projects at Marsh Harbour in the Bahamas are improving resilience to future storms by combining power from the grid with solar energy. In some countries, these issues are a subject of concern to the highest levels of government.

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French company TECHNIC EXPORT has developed a mobile field bakery, a solution designed to meet the needs of people in emergency situations, whatever the geography or climate.

For its part, MOS NUTRITION is developing foods adapted to extreme conditions and that already carry the label «used by the French armed forces». These foods are designed to provide nourishment anytime, anywhere. They do not melt, freeze, crumble or induce thirst, and have an 18-month shelf life.

SHELTER & REST

In the event of natural or man-made disasters, climate conditions require a high production capacity of good quality tents and shelters which, when adapted and fitted out, can also fulfil many functions such as those specific to field hospitals.

EASYCUBE, a subsidiary of the French group DREYER, deploys accommodation units, training centres, agri-food processing plants and local energy generation plants. Each project calls on the work of the local population and develops skills on the installation site. Among its noteworthy projects, structures were deployed in Liberia in 2023.

Rapidly deployable inflatable tents are ideal for providing immediate accommodation following natural disasters. Designed by the German company LOSBERGER DE BOER, they can span up to 145 m² and can be set up in 5 to 30 minutes, whatever the terrain and weather conditions. As they are modular, they can be connected together in different configurations to form a complete camp. Their highly resistant PVC fabric cover guarantees a 100% weatherproof living environment. In spring 2020 they were used to set up a field hospital in the heart of Central Park, New York.

Family firm BODY ARMOR RECYCLER (France) has developed temporary-use blankets for emergency accommodation and rescue services. Water-repellent and filled with recycled fibres, these blankets provide comfort for victims. Their French manufacture draws on a uniform recycling programme to provide the fibres to fill the blankets.

The HUT' from HUTCHINSON (a French company) is an all-in-one shelter that can be set up in less than 10 minutes. Equipped with lighting, furniture (benches and tables), a 25 m² inflatable tent (with built-in battery and inflator), a water point and a PC recharging zone, it can be used both to manage a crisis in complete safety and as living quarters for teams.

THE NECESSARY MANAGEMENT OF CBRN RISKS

The European Commission, in cooperation with the International and Ibero-American Foundation for Administration and Public Policy, supports the development of resources in many African countries (Kenya, Morocco, Mauritania, Senegal, Uganda, Democratic Republic of Congo, Burundi, Gabon, Rwanda).
Some countries are making this form of risk management an absolute priority. These countries include India, which has set up specialised equipment in direct liaison with the Defence Research and Development Organisation affiliated to the Indian government.

The NBC Mk V suit has been developed on the basis of the American military standard MIL DTL 32102. It protects soldiers against chemical vapours and droplets, biological agents and radiological dust. The Indian Army has placed an order for 50,000 suits.

The facemask with integrated hood is designed for personnel wearing a patka or with a cheek cut or wound. It consists of a breathing mask, a cartridge and a three-layer fabric hood. The head, face and neck areas not covered by the mask are detachable and are used only once. The resuscitator is intended for personnel who have inhaled chemical agents. A water poison detection kit has been developed to check the potability of water courses, ponds, springs, etc. It detects poisons and chemical warfare agents present in water. The residual vapour detection (RVD) kit detects vapours and gases of chemical warfare agents on the basis of specific chemical reactions with impregnated silica gel.
French company PROENGIN, one of the leaders in CBRN threat management, has developed a comprehensive approach to chemical threats that includes the "detect-to-alert", "detect-to-protect" and "detect- to-decontaminate" missions.

The Residual Vapour Detection (RVD) kit detects vapours and gases from chemical warfare agents based on specific chemical reactions with impregnated silica gel.

Portable solutions or solutions integrated into drones and robots provide real-time access to information and immediate implementation of dedicated measures. In France, OUVRY has developed a filtering suit that offers 12-hour protection against CBRN agents in liquid, vapour or aerosol form. In particular, it allows heat to escape quickly, reducing the risk of overheating.
PROTECOP offers a deminer's suit designed for stand-up reconnaissance and demining operations. It combines effective protection against the threat with ergonomics compatible with demining operations and sufficient resistance to withstand harsh weather conditions.

Some countries are making CBRN risk management an absolute priority, such as India.

MEDICAL SUPPORT, EMERGENCY CARE, PHYSICAL AND MENTAL RECONSTRUCTION

CEGELEC DÉFENSE designs advanced medical stations folded into a 20-foot ISO container that can be deployed in less than an hour and can accommodate 12 to 18 patients in relative to absolute emergencies. They carry all the necessary medical equipment: oxygen distribution, scopes and stretchers. Self-sufficient in energy and lighting, they are also air-conditioned. The Medical Support Unit is transported by a truck on a hydraulic cradle and is air transportable. Initially designed to respond to exceptional medical situations, disasters or attacks, they have proved useful in improving hospital capacity and during the COVID 19 pandemic. CEGELEC DÉFENSE also responds to chemical risks with its Mobile Decontamination Units (MDU) based on the structure of a deployable shelter. The MDU has eight decontamination lines and can decontaminate 80 patients per hour. It also addresses the need for hospital capacity to deal with the influx of large numbers of victims.

AIRBUS DEFENCE AND SPACE, meanwhile, offers a complete operational medical chain that guarantees the best possible care anywhere and at any time, dedicated to external operations (during conflicts, humanitarian and development missions, peacemaking and peacekeeping). This solution comprises a set of medical remote expertise solutions based on ACETIAM's Nexus software. It enables multiple players to exchange teleconsultation and medical imaging data reliably and securely.

VRMaze Research from INMIND-VR (France) is a software solution that enables human brain and behavioural capacities to be studied in near-real conditions. Operators have access to a content creation module that can be adapted to suit their needs. As each crisis is unique,

the InMind-VR solution can be used to assess the stress or trauma of victims who have recently experienced a difficult situation. Non-experts can administer the tests and pass on the information to qualified psychologists, who can then make a diagnosis and take effective action.

During a disaster, there is limited availability of trained mental health professionals, despite them being needed more than ever . There is growing interest in using robots powered by artificial intelligence to provide psychological support and build resilience in disaster zones. These robots, often designed to resemble humans or animals, are equipped with advanced algorithms that enable them to interact with people. They can recognise and respond to human emotions, engage in conversation and bring comfort to people in distress. They can be programmed to provide evidence-based psychological interventions, such as cognitive behavioural therapy and mindfulness exercises, which have been shown to reduce symptoms of anxiety, depression and post-traumatic stress disorder. Initiating virtual connections can help reduce feelings of isolation and promote a sense of belonging. But this is not without ethical considerations. The potential loss of human contact in mental health care, the risk of over-dependence on technology, and data confidentiality and security all need to be addressed. In this regard, it is crucial that researchers, authorities and mental health professionals work together to develop and implement AI-based interventions that are both effective and ethical. However, offering traumatised people access to comprehensive mental health care and human interaction must still continue to be promoted, as it is acknowledged that artificial intelligence cannot completely replace the human aspect of healing and recovery. While all these technologies now in use or in the pipeline help bring efficiency benefits to operational staff in anticipating and managing risks and crises, people working in the field call for tools that are easier to understand and use. Decision makers need more clarity. A gap needs to be bridged between research and innovation and the operationalisation of tools. This will make it possible to align these elements with the strategies developed by the various countries.

It is crucial that researchers, authorities and mental health professionals work together to develop and implement AI-based interventions that are both effective and ethical.

BUILDING OUR RESILIENCE TO GLOBAL SHOCKS

Faced with increasingly complex crises and hybrid threats, it has become necessary to redesign our model and to reinvent ourselves. Anticipation, prevention, coordination, funding and technological tools will be the assets of this crisis management planning.

The players committed to the subject of crisis and risk management in the political, institutional and operational spheres worldwide, who have testified and contributed to the creation of this document, have shared five structuring dimensions to be addressed to prepare for the future through suggestions and points for reflection which we share here, and which call for debate and study by all stakeholders.

States, the European Union and the cooperation system for development all need to develop their own emergency relief strategies and mechanisms to collectively respond to global challenges, shocks and crises.

5 STRUCTURING DIMENSIONS TO PREPARE FOR THE FUTURE

A global, agile and coordinated strategy

Clear and agile national risk reduction strategies must incorporate a systemic and decompartmentalised approach to these risks. This involves an adaptation to planning, anticipation and management. States, the European Union and the cooperation system for development all need to develop their own emergency relief strategies and mechanisms to collectively respond to global challenges, shocks and crises.

- Invest in risk data collection and analysis tools to enable national risk reduction strategies tailored to the context to be formulated
- Provide mechanisms and arrangements for sharing and exchanging this data
- Understand and promote the social, ecological and economic dimensions of exposure and vulnerability so that they are better taken into account in crisis management plans
- Focus plans and strategies on inclusion and equality in order to effectively promote resilience throughout society
- Take into account the psychological dimension and the impact of the crisis on individuals in crisis management plans
- Anticipate and prevent the effects of climate change on health
- Reinforce and adapt civil security policies to monitor changes in the scale and typology of risks
- Ensure a high and constant level of natural risk prevention despite a changing climate

Reinforce cooperation and governance at every level

- Appoint a national coordinator in each country in charge of preparing the nation for better crisis management
- Clarify the role of each player and their tasks
- Clarify and streamline the corpus of regulations, which has become illegible due to the accumulation of sometimes contradictory frameworks.
- Improve the sharing of information, data, facts, plans and the digital tools that facilitate this between stakeholders and countries
- Bring scientists and operational teams together to respond to global needs in a coherent, cross-functional way
- Improve territorial continuity
- Include climate action in multi-sector development strategies
- Ensure long-term financial, human and technical support for national crisis management systems
- Increase funding to support development

- Anticipate the possibility of insurers refusing cover
- Reinforce training of operational players to develop their skills in using new technologies
- Multiply multi-sector crisis exercises incorporating complex scenarios
- Improve crisis communication
- Step up the fight against misinformation
- Reinforce coordination and co-production between private and public players
- Reinforce the risk approach in the maritime field, which is currently underestimated
- Work on the rampant crisis of drought
- Consider risk basins in their entirety

Develop suitable financing mechanisms and incentives for resilience

Governments, international organisations and private donors must contribute to emergency and reconstruction funds. The occurrence of crises, now systemic with an unprecedented succession of events, requires a change in approach to means of action and funding. On this point, it appears vital to step up preparedness and planning efforts.
Resilience involves relatively high investment, the profitability of which will be noticeable over the long term.

- Strengthen suitable financing, in phase with the increase in number, the overlapping and duration of crises

- Reassess the budget allocated to Major Natural Risk Prevention Funds

- Invest in innovative technologies to improve detection, anticipation and preparedness, but also to manage the crisis and prepare the nation's resilience, promoting the avenues of public-private co-production and pooling schemes.

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Strengthen the risk culture

Strengthening the risk culture at every level appears vital: States, institutions, businesses and citizens are all concerned.

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- Improve communication to citizens through the use of digital resources and mobile telephony
- Reinforce the adoption of existing tools by citizens
- Incorporate a hybrid communication plan to reach people who are isolated and unconnected
- Make training in life-saving actions and behaviour compulsory and organise an annual refresher course, starting in primary school.
- Develop and adapt multi-risk platforms to make them a national reference site to promote the culture of resilience
- Standardise prevention messages and ensure continuity of action by levelling our acculturation effects
- Generalise the sharing of forecasting scenarios between administrations and businesses
- Systematise feedback on exercises and crisis management, within the framework of an interdepartmental structure in charge of resilience.
- Strengthen the role of women in overall crisis management
- Strengthen risk preparedness exercises in schools and the overall resilience of pupils

International cooperation agreements and coordination mechanisms

International cooperation agreements and coordination mechanisms must be supported and consolidated

- Strengthen emergency strategies and solutions for international coordination in the event of a crisis
- Improve cross-sector and cross-border crisis management
- Reinforce preventive diplomacy
- Reduce inequality

"It is not enough to proclaim the virtues of multilateralism: we must continue to show its added value. International cooperation must adapt to changing times,"
Antonio Guterres, Secretary-General of the United Nations

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MOVING TOWARDS
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