CIMA Research Foundation

ANNUAL REPORT 2024

ENGLISH

To Franco

A visionary man of science, who was able to look beyond the subject itself to detect the driving force for progress in this dialogue. He taught those around him to think, doubt and build up knowledge, with accuracy and passion. He believed in science as key for society and in art as a practical tool at the service of knowledge, offering the scope to explore and understand the world. He has left us a legacy that goes beyond books: it is a way of seeing the world, of working and living.

www.cimafoundation.org

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INDEX

Dear readers,

It's hard for us – who are nevertheless used to complexity – to find the right words to describe what 2024 was like for CIMA Research Foundation: it was a year filled with successes, challenges, growth and awareness.

During 2024 we expanded our projects, our ambitions and our awareness, but primarily our human capital – our most strategic resource for optimistically tackling the future. We welcomed the competencies and energy of 14 new colleagues. This was a great step forward because CIMA Research Foundation is, first and foremost, made up of people, their stories, their journeys and their enthusiasm. We appointed five new Associate Directors, expanding our capacity-building programme and the link between risk, resilience, biodiversity and ecosystem functioning. Thanks to a partnership with the University of Genoa, 17 PhD students are conducting important research, such as that into the use of artificial intelligence for risk prevention. We formally established the Drought Department and the UAS and Monitoring Systems Department – two crucial assets for reading the present and preparing for the future.
In addition, Valle d'Aosta Regional Administration officially joined our founding partners: after a lengthy period working together, this partnership 'upgrade' shows us that a growing number of organizations have faith in us and believe in our work and our approach.

Unfortunately, 2024 was a year bringing war into our public discourse. We endeavoured to provide our contribution in two crises caused by armed conflict, in Ukraine and Sudan, where the world's most serious humanitarian emergency is still ongoing. Tools we had designed for times of peace became forms of urgent action in the field in countries at war: these have been applied to protect lives and communities forced to face both armed conflict and the uncertainties of climate change at the same time. Global warming and its repercussions on the climate leave no respite for these nations, but we nonetheless tried to demonstrate that protection against extreme natural events can be a peace project. In Ukraine and Sudan, we applied a decisive element of our risk know-how: 'from early warning to early action'. Our multi-risk bulletins were used by local civil protection units, international agencies and civil society organizations committed to protecting populations from the effects of drought or flooding. We did not do this alone, but by steadily developing our capacity to work with other actors and local experts. Once again in 2024 we saw that teamwork is an irreplaceable asset in tackling complex problems.

We continued to move forward in theoretical and applied research, releasing key publications such as the strategic *World Drought Atlas*) that CIMA Research Foundation coordinated upon request by the United Nations Convention to Combat Desertification (UNCCD) and the Joint Research

We want to promote a multidisciplinary culture regarding risk, intended as pro-active citizenry and a vital civic tool for navigating a world experiencing climate crisis

Center (JRC) of the European Commission. Presentation of the Atlas was a highlight at one of the world's most important events in environmental diplomacy, COP16 on desertification, in Riyadh. It was a proud moment for us: in such a high-profile context, we were able to gauge just how authoritative and reputable CIMA Research Foundation is recognized as by the international community. This presentation at COP16 in late 2024 also stood as the culmination of a year's work on knowledge development and sharing: we created the *Handbook on Risk Knowledge for Early Warning Systems* for the United Nations, we were involved in drawing up the risk profiles for nations in critical situations, such as Malawi, Niger and the already mentioned Sudan, and we compiled *Technical Guidelines for Forest Fire Risk Assessment* for the IPAFF project.

The year 2024 saw us publish 59 articles in prestigious scientific journals, consolidating our position as a point of reference in the civil protection and risk management context, regarding both research and operations. The ability to further strengthen the connection between knowledge and action is becoming increasingly prominent in the work we endeavour to carry out in Italy and worldwide.

Another mission we've set ourselves is to promote a multidisciplinary culture regarding risk, intended as pro-active citizenry and a vital civic tool for navigating a continent experiencing climate crisis. This is why we organized, together with the Italian Civil Protection Department, the conference "*Humanities and Social Sciences for the Civil Protection System*". This offered four precious days of discovery and reflection,
23-24 September and 21-22 October, looking into 99 research projects by 280 authors, exploring three macro-areas: *Responsibility and Care, Meeting the Other, and Acceptable Risk and Perceived Risk*.

Today we can look to the future with the ambition of people who are underpinned by a lengthy and substantial history. We wish to make ourselves useful to a society and a country that are forced to tackle a complex future. We want to contribute to the challenges posed by that future through our experience and our precision, but also through our willingness to explain ourselves, and to explain and spread knowledge, also physically expanding our operational space. This is the panorama giving rise to the relocation to Priamar – a symbol of rebirth and a meeting point between science, culture and civil society.

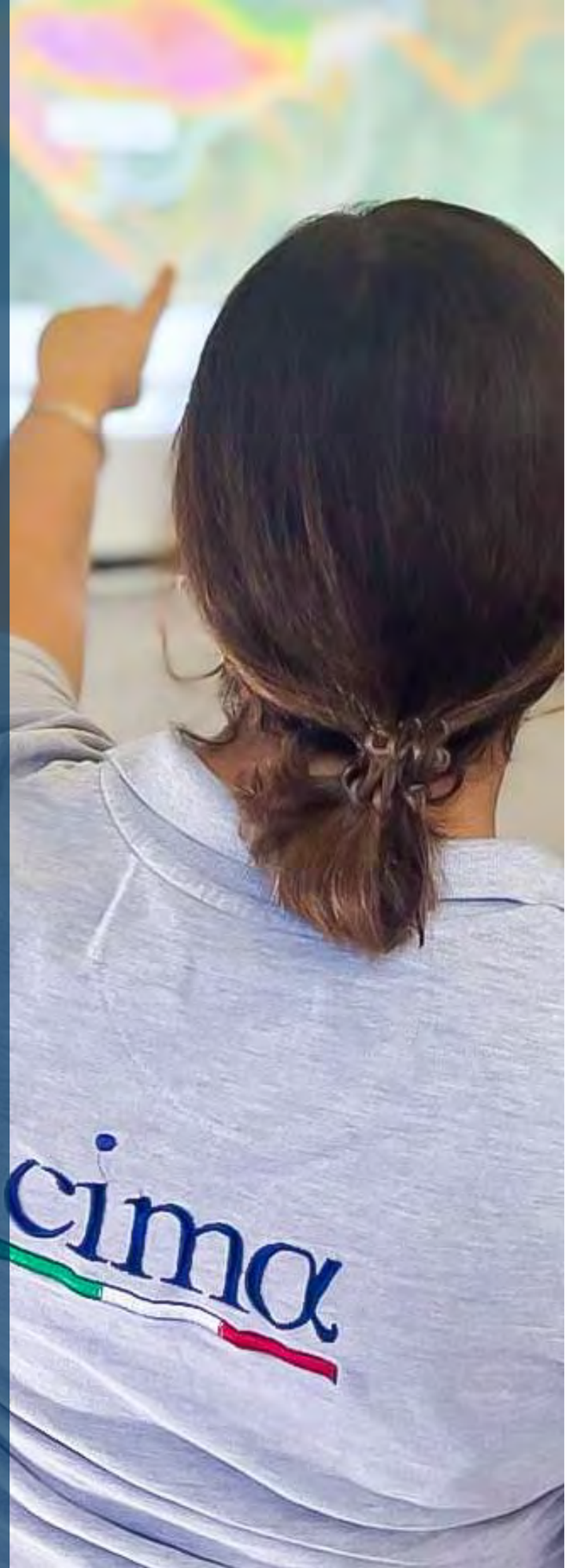
Among the bad news that we had to accept in 2024, none was as painful as the loss of our Franco Siccardi. Fate would have it that he passed away during the year when we celebrated the 20th anniversary of the *Early Warning System Directive*, through a large-scale event held in Rome with the Civil Protection Department: Siccardi believed in the directive, and dedicated his work and often his life to it.

This Annual Report is dedicated to him.
Franco was our teacher and always will be. CIMA will carry forward his legacy, his love of research, and his vision of knowledge embracing civil, public and shared values. Thanks to his tireless work, CIMA Research Foundation has become a point of reference for early warning and early action systems worldwide.

Thanks, Franco, forever.

01.

CIMA RESEARCH FOUNDATION



Risk cannot be eradicated, but it can be understood, faced and, above all, prevented.

CIMA RESEARCH FOUNDATION

INTERNATIONAL CENTRE FOR ENVIRONMENTAL MONITORING

OUR FOUNDERS

Storms pounding with unexpected violence, rivers bursting their banks, forests in flames, and arid lands that were once fertile. Climate change has transformed these events into ever more frequent and devastating threats. This is the context to CIMA Research Foundation's tireless work to understand, forecast and mitigate the risks connected with extreme natural events, with the aim of protecting the environment and the communities living in it.

Our research is based on data, mathematical models and artificial intelligence – tools that enable us to predict natural disasters and to assess their impact. Yet our approach goes beyond scientific analysis: we firmly believe that people's involvement is essential. This is why we work in close contact with communities, to develop participatory civil protection plans, so that awareness and preparedness can make the difference during critical moments.

Besides research and prevention, we also focus on legal aspects associated with risk: we assess national and international regulations, we evaluate legal compliance and we look into the responsibility connected with managing emergencies. In any case, risk is not only a natural occurrence – it always brings with it complex implications requiring precise and prompt responses.

CIMA Research Foundation's roots date from the 1980s, when the then Minister of Civil Protection Giuseppe Zamberletti entrusted the task of studying landslide and flood risk mitigation strategies to Franco Siccardi. This initiative saw creation of the Inter-university Centre for Environmental Monitoring, which became CIMA Research Foundation in 2007, thanks to the support from the Italian Civil Protection Department, Liguria Regional Administration, the University of Genoa and Savona Provincial Administration. Over the years, our network has expanded, and has also been joined by ARPA Liguria and Valle d'Aosta Autonomous Regional Administration.

In 2012, we were designated Competence Centre in the Civil Protection System for hydro-meteorological and wildfire risk as well as for the legal aspects connected with civil protection. Six years later, in 2018, we became an operational body of the Italian Civil Protection Service. Since 2020 we have been working with ItaliaMeteo, and we have

been members of the COSMO Consortium for meteorological modelling and of the Italian Center for Research on Risk Reduction – CI3R since 2021. Our expansion has also taken us beyond Italy's borders, with an operational office in Albania since 2011 and a 166-person team committed to global projects.

Our range of action has broadened over the years: initially focusing on hydro-meteorological hazards, we have expanded our research to all the aspects of risk influenced by climate change. Today our work includes monitoring, forecasting, assessment, mitigation and impact analysis. Our Situation Room stands at the heart of this, and operates 24 hours a day, 365 days a year, to ensure constant support to civil protection activities in Italy, Europe and the rest of the world.

Our missions take us wherever our know-how and action is needed: from Africa to Latin America, from the Balkans to Asia, we operate in the field and in decision-making centres to study occurrences, prevent disasters and find sustainable solutions. We work with governments, local authorities and communities, but also with prominent international institutions. Our projects are carried out with support from United Nations, European Union, ESA and World Bank agencies, confirming a commitment that knows no boundaries.

CIMA Research Foundation is not just a research centre: it is a reference point for building a safer and more resilient future. Because risk cannot be eliminated, but it can be understood, addressed and, above all, prevented.

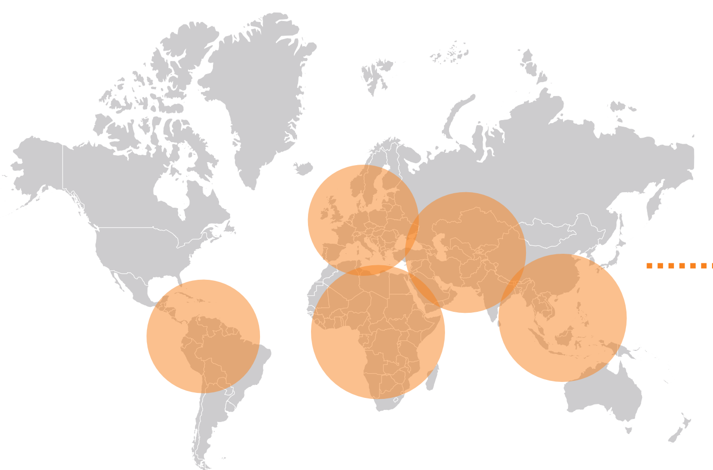
We are part of a global ecosystem, where each element is interconnected with the others

WORLDWIDE

Our know-how stems from the experience accrued in environmental risk in the Liguria area, and especially in floods and wildfires. Liguria, with its intricate mountainous landscape and fragile terrain, has taught us to understand and manage complex events. Nonetheless, one thing is clear: risks do not halt when they meet local, regional or national borders. We are part of a global ecosystem, where each element is interconnected with the others. Disasters that occur in one part of the world can have knock-on effects for other areas, highlighting the urgency for international cooperation and a shared vision.

This is why our work is not limited to the local contexts that we know best. We have chosen to place our experience at the service of Europe and many other areas of the planet, focusing ever more often on the African continent. With its exceptional geographical, climatic and cultural diversity, Africa stands as a crucial challenge and a unique opportunity for research and action.

Comparison with researchers from all over the world lies at the heart of our mission. Each new project is an opportunity to exchange knowledge, integrate different approaches and build innovative solutions, facing the challenges with a broader perspective and contributing to building a resilient future for everybody, where the lessons learnt in Liguria can be applied to African savannahs, river deltas, or semi-arid areas.



AREAS WHERE MOST PARTNERSHIPS ARE FOCUSED

8 STRATEGIC **PROGRAMMES**

14 **FIELDS** OF COMPETENCE

104 **PROJECTS ACTIVE** IN 2024

88 **COUNTRIES** IN WHICH WE WORK

93 **ORGANIZATIONS** WE WORK WITH

Eight strategic programmes tracing out our directions in research and innovation

OUR **RESEARCH**

Right at the heart of the CIMA Research Foundation scientific mission are our strategic programmes, which trace out our directions in research and innovation. Eight intertwining routes guide us in tackling the challenges posed by climate change, risk management and technological development, all with the same goal of building a more resilient and sustainable future.

The power of data in climate change

The **Intelligent Data Use in a Changing Climate** programme explores the potential of advanced data analysis and high-resolution climate modelling. Ranging from real-time forecasts to long-term climate models with an information-sharing approach, this programme connects research and application, integrating data and knowledge of the territory to improve risk forecasts and adaptation strategies.

The digital-twin age and technological innovation

In the research world, technological innovation is not only a goal but also a bridge between theory and practice. **Technological Development in the Digital Twins Era** is our most technological programme, and focuses on closing the gap between research and operations. Automation and environmental monitoring are deployed and paired with the ACRONET control units, so that we can convert this science into real tools for managing risk and protecting the relative local areas.

Biodiversity and resilience: an emerging link

Climate change can threaten ecosystems and communities, while biodiversity can be a key for resilience. **The Emergent Nexus: Risk resilience, biodiversity and ecosystem functioning** focuses on this connection, exploring strategies to protect ecosystem services and to provide support for the ecological transition. By drawing on a new risk assessment approach, we take into account the adaptation capacity of sustainable businesses, so that a balance between development and conservation can be built.

Capacity building to face the future

Adaptation to climate change requires knowledge and readiness. **Capacity Development for Resilience & Climate Adaptation** has emerged from the experience accrued in emergency management centres, with the strengthening of prevention capacity and response to disaster. This programme stands among the aims of the United Nations initiative Early Warning for All, ensuring that the know-how acquired through our projects can be translated into long-lasting results serving the most vulnerable communities.

Predicting to protect: early warning and impact systems

Risk forecasting is not only a question of data but also the real impact on people and the environment. **Impact-based Early Warning Systems of Climate Threats** aims to improve alert systems through increasingly detailed forecast modelling capable of precisely estimating the effects of extreme natural events such as floods, drought and forest fires. The goal? To go from mere weather forecasts to full-blown decision-making support tools for civil protection and communities.

Data-informed policies for integrated risk management

Policy-making needs to be based on reliable and up-to-date knowledge. **Multi-Risk Assessment and Data-Informed Policies** provides tools for tackling climate risks with an integrated approach, analysing not only the single hazards but also their interactions. From a local to an international scale, this programme endeavours to ensure consistency between risk analysis and policy, contributing to a more effective approach based on solid data.

Governance and responsibility in civil protection

Risk management is not just a question of operations but also of regulations. **Governance & Responsibility in Civil Protection Systems** deals with the issue of legal responsibility in civil protection action, and works on the defining of regulatory tools for adaptation to climate change in Italy. From the national through to the local scale, the programme explores the administrative and legal challenges, aiming to foster more effective and responsible governance.

A multidisciplinary approach to risk management

Risk management requires a broad vision, one capable of integrating the so-called 'hard ' sciences with communication, while also involving communities. **Disaster Risk Management and Climate Change Adaptation: a Multidisciplinary Approach** is our most cross-sector and holistic programme, and it brings together scientific and social competencies so as to strengthen adaptation strategies. We study how civil protection systems can evolve to tackle the new climate scenarios, transforming emergency planning into a prevention and resilience tool.

Eight programmes and a single uniting theme: the will to place science at the service of society, to tackle the challenges of the future together.

Behind each achievement reached by CIMA Research Foundation lies the commitment of a close-knit team – our greatest asset

166
HUMAN RESOURCES FROM VARIOUS COUNTRIES, **MADE UP OF:**

138
EMPLOYEES AND **CONTRIBUTORS**
81 MEN **57** WOMEN

17
PHD STUDENTS
9 MEN **8** WOMEN

9
INTERNS
3 MEN **6** WOMEN

2
RESEARCH FELLOWS
2 WOMEN

THE **VALUE** OF **PEOPLE**

Our research is not limited to abstract theory, but is deeply rooted in people. It is thanks to the passion, dedication and curiosity of those who work with us that we can transform ideas into tangible results, day after day. Behind each achievement – however great or small – reached by CIMA Research Foundation stands the commitment of a close-knit team, which is our greatest asset.

This is precisely why investing in the quality of our working environment is a constant priority. We believe that people's well-being is the first step towards ensuring excellent results, and so to achieve this we adopt welfare policies that meet the needs of an evolving society. We offer flexible working hours to foster a better work-life balance, encouraging remote working as a tool for reconciling productivity and autonomy, while making services such as company canteen and accommodation available. Alongside these is broad private health coverage, designed to bring peace of mind and security to all our employees and their families.

But our commitment does not stop here. We firmly believe in people's potential and their growth, and so we invest in constant training, with the accent on the younger generations. Our internships and training programmes provide them with the opportunity to make the most of their abilities and embark on a solid career.

Core to all this is a clear and inclusive vision: ensuring equal opportunities and shaping a work environment where nobody is left out. This approach has yielded concrete action, such as adoption of the *Gender Equality Plan* in 2021 and publication of *Linee Guida del Linguaggio Inclusivo* (inclusive language guidelines) in 2023, as well as the Inclusion and Diversity training – further steps towards promoting respectful communication and removing barriers.

CIMA Research Foundation is, first and foremost, a community of people united by shared values and the desire to build a better future.

TO GET TO KNOW US:
https://www.cimafoundation.org/en/human-resources/

INTERNAL **ORGANIZATION**

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Communication
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Risk Assessment and Loss Data
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Monitoring Systems and UAS
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Administration
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Planning and Procedures
Coordinator: Antonio Gioia

Wildfire Risk Management and Forest Conservation
Coordinator: Silvia Degli Esposti

ICT
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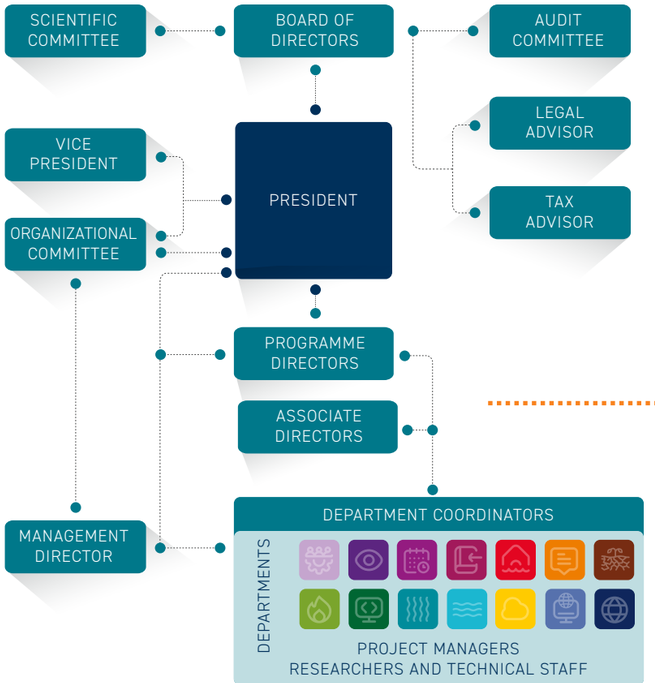
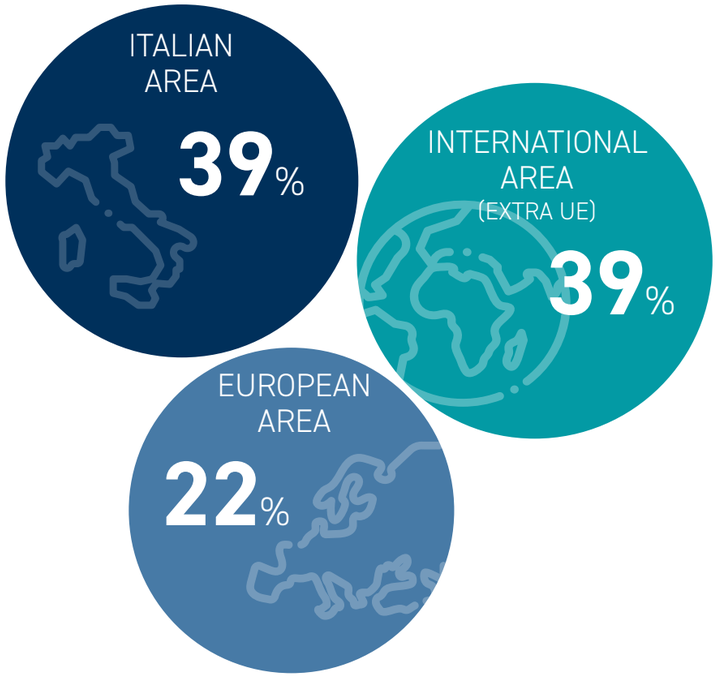


ORGANIZATION STRUCTURE

FINANCIAL SECTION

FINANCIAL STATEMENT 2024

REVENUE	
Revenue from projects	14.296.844,71 €
Revenue from donations and *5xMille* tax allocations	5.202,29 €
Total revenue	**14.302.047 €**
EXPENSES	
Consumables (a)	851.257,00 €
Services (b)	3.775.180,00 €
Rentals (c)	275.043,00 €
Personnel (d)	8.434.757,00 €
Other operating expenditure (e)	795.571,00 €
Total expenditure (a+b+c+d+e)	**14.131.808,00 €**
PROFIT (NET OF TAXES)	**207.443,00 €**



FUNDING AREAS

02.

HIGHLIGHTS

Our projects are engines for innovation and scientific collaboration, driving the development of advanced solutions for risk management and protection of the environment and communities

PROJECTS
IN ITALIAN AREA
32%
33 ACTIVE PROJECTS
IN 2024

PROJECTS
IN EUROPEAN AREA
28%
30 ACTIVE PROJECTS
IN 2024

PROJECTS
IN INTERNATIONAL AREA
40%
42 ACTIVE PROJECTS
IN 2024

50
PROJECT MANAGER
IN 2024
46%
54%

628
DAYS
AVERAGE TOTAL PROJECT LENGTH
IN 2024

4956
MISSIONS
IN 2024

PROJECTS IN RELATION TO THE PROGRAMMES

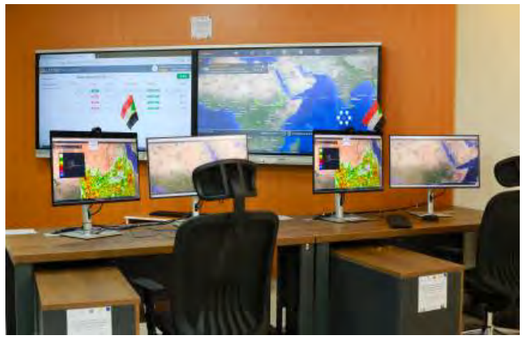
- **13%** CAPACITY DEVELOPMENT FOR RESILIENCE & CLIMATE ADAPTATION
- **15%** IMPACT-BASED EARLY WARNING SYSTEMS OF CLIMATE THREATS
- **15%** MULTI-RISK ASSESSMENT & DATA-INFORMED POLICIES
- **12%** INTELLIGENT DATA USE IN A CHANGING CLIMATE
- **10%** TECHNOLOGICAL DEVELOPMENT IN THE DIGITAL TWINS ERA
- **11%** DISASTER RISK MANAGEMENT AND CLIMATE ADAPTATION: A MULTIDISCIPLINARY APPROACH
- **14%** THE EMERGENT NEXUS: RISK RESILIENCE, BIODIVERSITY AND ECOSYSTEM FUNCTIONING
- **10%** GOVERNANCE & RESPONSIBILITY IN CIVIL PROTECTION SYSTEMS

Conflicts and climate: the Early Warning System in Sudan

The climate crisis and the dramatic conflict in Sudan have exacerbated conditions for local communities, but the **APIS** project – implemented by CIMA Research Foundation and financed by AICS (Italian Agency for Development Cooperation) – has managed to move further towards its goal of strengthening the early warning system.

Since the war began in April 2023, CIMA, AICS, the African Union, ICPAC, UNDRR and other institutions and a diaspora of Sudanese experts have been working together, from various countries, on the early warning system. This joint effort has enabled the effects of flooding and droughts to be mitigated, protecting communities already suffering from the world's greatest humanitarian crisis. Particularly important has been the partnership between institutions and civil society, which has enabled creation and dissemination of risk-impact bulletins.

Although logistical difficulties and infrastructural fragility remain sizeable obstacles, the national and international cooperation network has managed to continue providing support in Sudan. We are working to consolidate the results already achieved and to guarantee an autonomous alert and prevention system for the future Sudan, which is finally experiencing peace, so that it can safeguard its population and lands.



One more step towards EW4All: Africa's first national room

On 14 June, the *Emergency Operations and Communication Center Situation Room*, was inaugurated in Dodoma, Tanzania. It is the first national situation room in the **AMHEWAS** network **- Africa Multi Hazard Early Warning and Early Action System**.

The room has been financed by the Italian Ministry of Foreign Affairs, AICS and the UN office for Disaster Risk Reduction (UNDRR), with scientific, technical and operational support from CIMA Research Foundation. It aims to improve coordination of early warning systems in Africa, to strengthen Tanzania's capacity to manage flooding and drought, and also to become a key hub for connecting on national, regional and continental levels.

A similar process saw the opening on 9 September of the ECCAS Regional Situation Room in Cameroon, extending the continent's regional-range coverage. This stands as another success for international cooperation in establishing greater climate resilience in Africa and worldwide.

Both rooms are part of AMHEWAS, the African Union Commission (AUC) programme that, since 2019, has been aiming to extend early warning systems to the whole population by 2027. Several operations rooms have been set up since 2021: besides those already mentioned, there are also rooms in Nairobi, Addis Abeba, Niamey, Abuja and Nacala. This network operates 24 hours a day and uses the myDEWETRA. world platform to integrate data and issue standardized bulletins, enabling prompt responses and coordinated and efficient preventive measures.

Mapping the future: risk assessment in Malawi

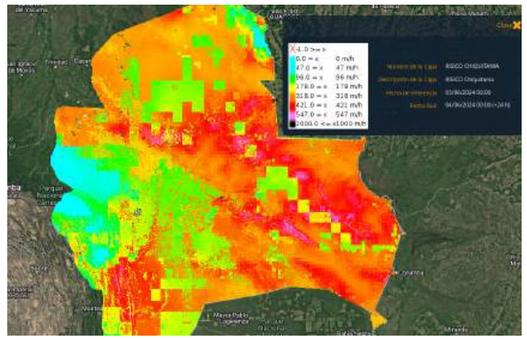
Malawi is highly exposed to extreme natural events such as flooding and drought, which are aggravated by climate change and urban growth. The country previously lacked a national multi-risk assessment as this was available only for some areas. Funded by Malawi's Ministry of Water and Sanitation, the project **Comprehensive Multi-Hazard Risk Assessment in Malawi** went to fill this gap, creating a hazards and risks map on national and provincial scales, applying a probabilistic approach.

In line with the Sendai Framework for Disaster Risk Reduction, the multi-risk profile includes both common and rare events, considering not only current climate conditions but also future projections (2050-2100).

The project was built with local stakeholders' active involvement in data collection and creation of a risk atlas and a web-based information platform, to facilitate communication and comprehension. The results include a methodical report, analysis of hazard level, databases on vulnerability, a multi-risk atlas, training workshops, and a dissemination platform managed by CIMA Research Foundation.

Managing fire: an integrated system for Bolivia

All over the world forest fires have become a growing threat, one aggravated by climate change and extreme weather conditions. Devastating events – such as those in California, Brazil and Bolivia in the last two years – highlight the vulnerability of ecosystems and the need for efficient strategies to forecast and mitigate risk.



CIMA Research Foundation was called to adapt its advanced RISICO tool – a model it had developed, and where meteorological data, topographic models and information on vegetation are integrated to accurately forecast potential wildfires – and tailor it to Bolivia's Chiquitania region, as part of the **EUROCLIMA** programme, led by Expertise France.

Designed to forecast and monitor conditions favourable to the starting and spreading of wildfires, RISICO combines local data and drought indices to improve forecast accuracy. The information generated is used in the alert bulletins issued by SENAMHI (Servicio Nacional de Meteorología e Hidrología) to provide support to local authorities in their operative decision-making.

Borderless blazes: cooperation between Georgia and Azerbaijan

Begun in 2023, **SAILOR** is a project funded by the European Civil Protection Mechanism to assess forest fire risk affecting both Georgia and Azerbaijan. Its aim is to strengthen wildfire management through analysis, procedure updating and mitigation plans. Coordinated by the University of Western Macedonia, the project includes investments, training and a bilateral agreement between the two countries for a more incisive international response.

CIMA Research Foundation heads the joint risk assessment, creating static maps based on climate data and future scenarios. It has also provided UAVs and mobile weather stations to improve the monitoring and management of wildfires, organizing training courses on the use of the PROPAGATOR simulator and on operating drones in a forest context for local experts. An effective step towards greater prevention and cross-border cooperation, which contributes to reinforcing the resilience of an area at risk of wildfires.

Knowledge and prevention: the EWS handbook for the United Nations

The **Handbook on Risk Knowledge for Early Warning Systems**, has been compiled by UNDRR and CIMA Research Foundation to assess and apply risk knowledge in early warning systems (EWS).

Its first draft was presented at the UNDRR workshop in Bangkok (30 April - 2 May), focusing on Pillar 1 of Early Warnings for All (EW4All), an initiative taking risk management as a basis for monitoring, communicating and responding to hazards. The first workshop was useful for testing out the guidelines while also presenting tools such as the myDEWETRA platform and EWS examples in other parts of the world, such as the AMHEWAS project in Tanzania.

Based on three key principles (improvement of data-collection standards, inclusion of local knowledge, and use of technological innovation), the handbook is structured as a "*living document*", that is constantly evolving and integrating tools and good practices from various regions of the world, while feeding on international experiences during its roll out.
It demonstrates that cooperation between sectors and regions is a vital component in risk prevention and preparedness for disasters.

Risk is a group occupation: the results of PPRD East 3

Now having reached its conclusion after four years work with and in Armenia, Azerbaijan, Georgia, Moldova and Ukraine, the European Commission-funded **PPRD East 3** project has strengthened the participating countries' resilience and their collaboration based on the EU Civil Protection Mechanism model, through training, table-top and full-scale exercises, and technological innovation.

The broad-scale training drills have improved cross-border collaboration and use of the EU Civil Protection Mechanism, highlighting the importance of coordinated and effective responses to emergencies.

The training has strengthened operational preparedness and influenced risk management policies. Led by the Swedish Civil Contingencies Agency (MSB), with the Italian Red Cross and the Ministry of Interior of the Slovak Republic as partners, it leaves a precious legacy for the future of risk management in the countries involved.

Friendly fire: guidelines for managing forest fires in the Balkans

In the context of the closing event of the **IPA Floods & Fires** project, we presented the *Technical Guidelines for Forest Fire Risk Assessment* in the Western Balkans and Turkey. The document promotes the integration of risk mapping into regulatory frameworks, cross-border cooperation and the use of advanced technologies. It is a further step in our efforts to strengthen climate resilience and improve risk management in civil protection systems.

Aggravated by the climate crisis and management of the local territory, forest fires threaten ecosystems and communities. Yet, the only way to effectively tackle them is through the application of coordinated strategies.

These guidelines offer standardized risk assessment methods, and focus on technological innovation, including machine learning.

Beyond borders: the Multi-Country Study on risks

Led by the Italian Civil Protection Department, the **Multi-Country Study** project aims to map out risks across 22 nations in the Balkans, North Africa and Central Europe, in line with the EU Civil Protection Mechanism cooperation strategy towards IPA (EU Instrument for Pre-accession Assistance) beneficiary countries and their neighbours. The study analyses the main national, cross-border and regional risks, pinpointing shortcomings in management and defining priorities for future action and programmes.

It aims to shape a programme based on concrete data, facilitating risk management strategies and strengthening civil protection capacities in the countries involved.

CIMA Research Foundation plays a key role in detecting hazards and risks, including climate-related ones. It collects, analyses and organizes existing data and maps, identifying omissions and providing recommendations prompted by the European guidelines. In addition, it holds training courses and workshops for national authorities, filling any gaps and strengthening local competencies to keep these up to EU standards.

Drought and its impacts: the need for a systemic approach

The **World Drought Atlas** is the most complete compilation of data and analysis on the impacts of drought on a global scale. Coordinated by CIMA Research Foundation alongside UNU (United Nations University) and Vrije Universiteit (Holland), and jointly commissioned by the United Nations Convention to Combat Desertification (UNCCD) and the Joint Research Center (JRC) of the European Commission, this innovative tool combines maps, infographics and case studies from all over the world to support adaptation and resilience strategies.

Sometimes silent but nevertheless devastating, drought threatens ecosystems, agriculture and economies, intensifying inequality and conflict. This atlas offers a scientific overview and practical solutions for tackling the issue, while making governments and the public more aware of the need for tangible action.

Presented during the COP16 negotiations in Riyadh, the document spotlights how climate change is quickening the frequency and intensity of droughts, making a global approach essential.

The World Drought Atlas uses 21 case studies to illustrate that no country is immune, and proposes strategies based on governance, land management and water conservation. More than a mere study, it is an invitation to action: building more resilient societies depends on the choices we make today.

Island resilience: preparedness tailored to the Indian Ocean

Four island states in the Indian Ocean (Comoros, Madagascar, Mauritius and Seychelles) face growing threats posed by natural disasters and the effects of climate change. Funded by UNDRR and the European Union, the **Resilience Building and Disaster Response Management in the Indian Ocean (RDRM-IO)** programme aims to reduce these risks by improving preparedness.

Central in the project is the analysis by the early warning for early and anticipatory action systems (EW-EAAS), which are essential for preventing catastrophes. The developed methodology combines existing assessment tools with table-top exercises based on simulations of emergencies, to test emergency procedures. UNDRR provides strategic guidance, also contributing to the EW4All global initiative, which aims at extending warning systems to all populations worldwide by 2027. Appointed by UNDRR, CIMA Research Foundation has, within this context, developed a methodology to assess the effectiveness of an EW-EAAS, considering risk awareness, monitoring, communication and response. Besides creating analysis tools, it coordinates training exercises in the various countries, focusing particularly on Madagascar and the Seychelles, while also providing support to Comoros and Mauritius.

The project not only strengthens local resilience but contributes to broader strategies, such as the Africa Road Map, to improve access to information on risk and to bring greater safety to communities when faced with an emergency.

Explorers of the deep: new frontiers in research on cetaceans

As part of two projects, NBFC (on marine biodiversity) within the Italian Recovery and Resilience Plan, a campaign was conducted in the west Ionian Sea to study two **deep-diving** sea mammals: the sperm whale (*Physeter macrocephalus*) and Cuvier's beaked whale (*Ziphius cavirostris*). Advanced technologies (UAS, hydrophones, satellite transmitters and dataloggers) made it possible to gather data essential to the conservation of these threatened species..

During 41 days of research, over 100 hours of acoustic monitoring was recorded, while sightings occurred of 9 sperm whales, 12 Cuvier's beaked whales, striped dolphins, bottlenose dolphins and about 120 sea turtles. The main results also feature the feedback from satellite tagging on a Cuvier's beaked whale, which enabled its behaviour to be tracked for 114 days. Two sperm whales were also CATS-tagged, resulting in recordings of their 3D swimming and vocalizations for 13 hours.

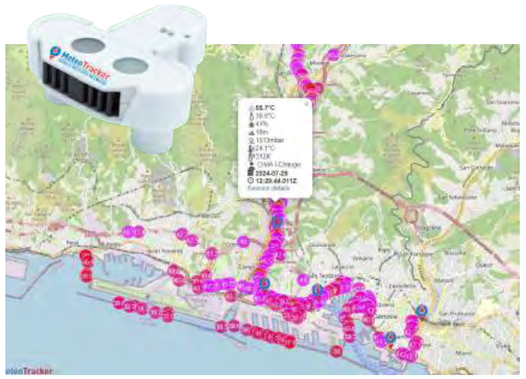
For the first time worldwide, a drone was deployed to attach a CATS tag with suction cups. In addition, and again thanks to UAS technology, photometry was carried out to measure the animals, and samples of breath from blowholes were collected from two sperm whales to assess their state of health. This mission marks a step forward in the use of new technologies to study cetaceans, providing precious data for research and conservation.

Citizen science and climate change

Funded by the H2020 programme, **Adaptation AGORA** and **I-CHANGE** are two European projects that seek to actively involve the general public in adaptation to climate change.

Adaptation AGORA aims to shape innovative strategies through society's involvement. These include Digital Agora as a space for co-design, two Digital Academies to access open-source climate data and fight disinformation, a mobile app on climate, and a digital handbook on climate adaptation.

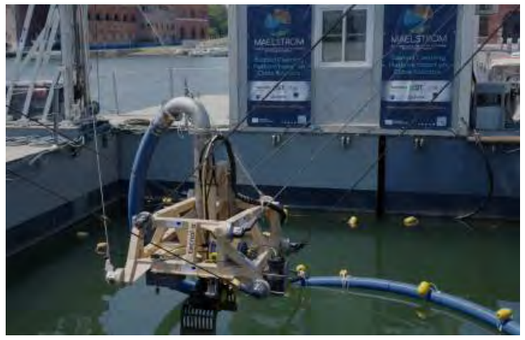
Instead, I-CHANGE encourages citizen science, to heighten awareness, collecting useful environmental data thanks to monitoring tools such as MeteoTrackers; these data are then used for observing and forecasting weather events. Through both projects, CIMA Research Foundation underlines the need to strengthen teamwork between science and society, promoting tangible solutions to adapt to climate change.



Smart technology for MArinE Litter SusTainable RemOval and Management

H2020 **MAELSTROM** is a project made up of 14 European partners to tackle the issue of marine waste management. It has developed innovative solutions for locating, removing, identifying, separating and recycling marine waste, by also integrating modelling, advanced robotics and artificial intelligence.

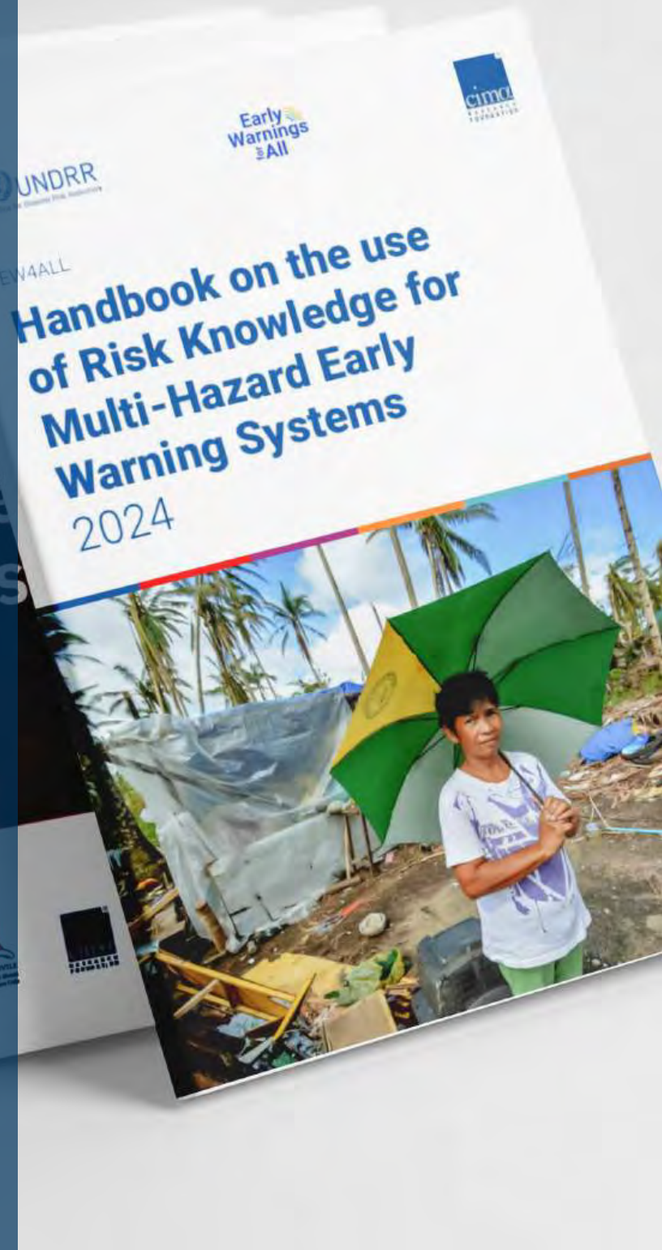
The two main technologies for removing waste – "*Bubble Barrier*" and the "*Maelstrom*" Robotic Seabed Cleaning Platform – were successfully tested, along the Ave River in Vila do Conde, Portugal, and in the Venetian Lagoon, respectively. About four tonnes of waste was trapped, and then removed, sorted and sent for recycling. In addition, MAELSTROM has also involved the local population, schools, policy-makers and the international community to deal with the issue with an integrated and sustainable approach.



A particularly innovative aspect of the project is its "*Legacy Document*", conceived and coordinated by CIMA Research Foundation. This brings together the empirical experiences and the challenges faced by the project partners during implementation. The purpose of the document is to increase the success rate of future sector initiatives, providing the international community with practical recommendations

03.

PUBLICATIONS



Debate and comparison in the scientific world has always been a fundamental feature in advancing research

SHARING OUR **KNOWLEDGE**

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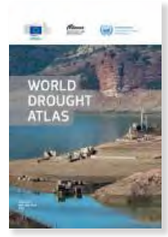

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04.

TRAINING

Getting ready to properly manage the natural risks that are becoming ever more common and devastating in the current context of climate change

CONFERRING OUR **KNOWLEDGE**

Education and training are the beating heart of the work by CIMA Research Foundation. Acquiring knowledge and skills is essential both for the younger generation venturing into the research realm for the first time and for professionals with consolidated careers who need to constantly keep up to date to best tackle natural risk management. This is why CIMA Research Foundation invests a lot of resources in academic paths and capacity building, with an inclusive and accessible approach.

One of the cornerstones of this mission is a partnership with the University of Genoa. The **NatRisk Master's degree** – a two-year course entirely in English – trains specialists able to address all the facets of natural risks, from monitoring to managing emergencies. The programme includes an internship at the Italian Civil Protection Department operations centres, enabling the students to apply their acquired knowledge in the field. The **Doctorate in Security, Risk and Vulnerability** offers the highest level of further education targeting risk mitigation and climate change, with a pronounced accent on sustainability and protection of biodiversity. Thanks to partnerships with foreign universities, the PhD students can earn joint qualifications and become part of the international research context, enriching their skill sets and creating new synergy.

Since 2020, CIMA Research Foundation has expanded its range of action by developing **e-learning courses** and making its experience available also through digital training: it has created high-quality interactive contents and involves sector experts, to ensure effective and innovative teaching.

Another high-impact study programme is **CETASMUS**. This training experience is aimed at students and researchers from all over the world wishing to acquire state-of-the-art methods for monitoring sea mammals. Besides attending lessons and workshops, participants also take part in field trips aboard the CIMA Research Foundation catamaran 'Headwind' and commercial ferries operating on Mediterranean routes, to acquire practical skills regarding the behaviour and distribution of cetaceans.

Again in the context of marine conservation, CIMA Research Foundation is the sole Italian certifying body for the trademark **High Quality Whale-Watching®** developed in conjunction with ACCOBAMS and the Pelagos Agreement. This certification – based on voluntary request – ensures high standards in sea-mammal watching, encouraging sustainable tourism and respect for the environment. The network currently comprises 15 operators in seven Italian regions, and the number of requests is constantly growing. This trademark is establishing itself as a key point of reference in defining marine strategy, and contributes to monitoring and safeguarding the areas where whale-watching takes place.

In addition, CIMA Research Foundation places careful attention on the legal aspects of risk management and civil protection. The year 2024 saw the drafting of the first report for **WikiProcessi**. This platform, set up in 2010 and constantly updated, methodically brings together documentation on legal cases –primarily national Italian and criminal cases – regarding civil protection operators' responsibility in events connected with flooding, landslides, earthquakes and extreme winds.

NATRISK MASTER'S DEGREE COURSE

41
STUDENTS ENROLLED ON NATRISK MASTER'S COURSE
A.Y. 2023/24

70%
STUDENTS RESPECTING COURSE SCHEDULE
A.Y. 2023/24

VISIT THE WEB PAGE!
https://corsi.unige.it/en/corsi/11921

RESEARCH DOCTORATE IN **SECURITY, RISK AND VULNERABILITY**

7
PHD STUDENTS ENROLLED RCCSD CURRICULUM
A.Y. 2023/24

6
PHD CURRICULA IN TOTAL
A.Y. 2023/24

VISIT THE WEB PAGE!
https://sicurezza.unige.net/

E-LEARNING COURSES

69
COURSES
AS OF 2024

8
LANGUAGES
AS OF 2024

1977
USERS
AS OF 2024

81
COUNTRIES
AS OF 2024

+13k
SINGLE LOG-INS
AS OF 2024

42
PROJECTS
AS OF 2024

VISIT THE WEB PAGE!

THE **CETASMUS** TRAINING PROGRAMME

15
STUDENTS
IN 2024

8
COUNTRIES OF ORIGIN
IN 2024

42
DAYS ON HEADWIND
IN 2024

38
DAYS ABOARD FERRY
IN 2024

VISIT THE WEB PAGE!

HIGH QUALITY WHALE WATCHING®

28
CERTIFIED OPERATORS
AS OF 2024

1
NEW OPERATOR
IN 2024

7
ITALIAN REGIONS
INVOLVED AS OF 2024

14
PEOPLE TRAINED
IN 2024

VISIT THE WEB PAGE!

05.

EVENTS

ENGAGING THROUGH OUR **KNOWLEDGE**

2024

- 01 JAN 2024 — Regional Workshop **IPA CARE** Montenegro
- 22 FEB 2024 — Annual Meeting **I-CHANGE** Savona - Italy
- 02 MAR 2024 — Technical Workshop **AMHEWAS** Dodoma - Tanzania
- 20 MAR 2024 — Field Exercise **IPAFF** Skopje - Macedonia
- 15 APR 2024 — Conference **EGU 2024** Wien - Austria
- 23 APR 2024 — Conference **Looking back to move forward** 20 years Italian DPC WS Rome - Italy
- 14 MAY 2024 — Info-sharing Meetings **Pint of Science** Genoa - Italy
- 10 MAY 2024 — International Book Fair **I don't take risk** Turin - Italy
- 23 MAY 2024 — Kick-off Meeting **Proterina 4 Future** Savona - Italy
- 06 MAY 2024 — Workshop **APIS Sudan** Nairobi - Kenya
- 29 APR 2024 — Launch Event **Handbook on the use of Risk Knowledge for MHEWS** Bangkok - Thailand
- 24 APR 2024 — Conference **ICDRI 2024** New Delhi - India
- 27 MAY 2024 — Closing Event **IPAFF** Bruxelles - Belgium
- 28 MAY 2024 — Full Scale Exercise **PPRD EAST3** Armenia
- 03 JUN 2024 — Forum **European Civil Protection Forum** Bruxelles - Belgium
- 10 JUN 2024 — Opening **Emergency Operation and Communication Center Situation Room** Dodoma - Tanzania
- 17 JUN 2024 — Launch Event **Ready2Act** Maputo - Mozambique
- 21 JUN 2024 — Closing Event **Flood and Drought Management and EW for CC Adaptation in the Volta Basin** Ghana
- 27 SEP 2024 — Commemorative Event **"Knowledge to replace fear" in memory of Franco Siccardi** Savona - Italy
- 23 SEP 2024 — Conference **Humanities and social sciences for the civil protection system** Rome - Italy
- 09 SEP 2024 — Opening **CEEAC-ECCAS Situation Room** Douala - Cameroon
- 02 SEP 2024 — Partnership Conference **NOE** Nairobi - Kenya
- 24 JUL 2024 — Annual Conference **Global Flood Partnership** Nairobi - Kenya
- 14 JUL 2024 — Training **NOE II - Dewetra** Uganda
- 30 SEP 2024 — Conference **Drought Resilience +10** Geneva - Switzerland
- 04 OCT 2024 — World Tour **Amerigo Vespucci sailing vessel** Darwin - Australia
- 13 OCT 2024 — National Day **I don't take risk** Italy
- 21 OCT 2024 — Event **Africa Regional Platform DRR** Windhoek - Namibia
- 23 OCT 2024 — Event **The Science Festival** Genoa - Italy
- 04 NOV 2024 — Italian UAS Network Training Exercise **EXE Spotorno 2024** Savona - Italy
- 26 NOV 2024 — Event **SUDAN - Early Warning and civil protection for floods and droughts** Cairo - Egypt
- 14 NOV 2024 — Event **Meteorology Festival** Rovereto - Italy
- 11 NOV 2024 — Conference **COP29** Baku- Azerbaijan
- 07 NOV 2024 — Conference **IDROMET IWRM AICS** Addis Abeba - Ethiopia
- 19 NOV 2024 — Platform **Europe and Central Asia Regional Platform for DRR** Budva - Montenegro
- 04 NOV 2024 — General Assembly **MedEWSa** Barcelona - Spain
- 02 DEC 2024 — Conference **COP16 - UNCCD** Riyadh - Saudi Arabia
- 09 DEC 2024 — Launch Event **UNDRR AUC IV EW4All initiative** Niamey - Niger
- 04 DEC 2024 — Conference **160 Years of Humanitarian Commitment: The IRC and the Ukrainian Crisis** Rome - Italy
- 10 DEC 2024 — Launch Event **World Drought Atlas** Riyadh - Saudi Arabia
- 10 DEC 2024 — Final Workshop **ROAD MAP 2** Rome - Italy
- 11 DEC 2024 — Closing Event **COVALEX** Brindisi - Italy

2025

06.

FOCUS AREAS

THE **WATER** CRISIS

WATER, SNOW, DROUGHT

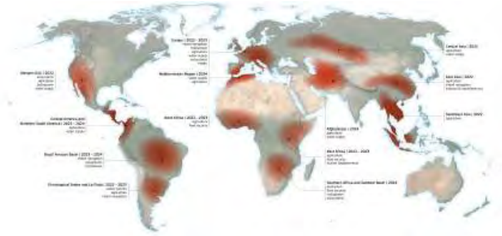
Winter 2023-24 marked a turnaround in trend for snowfall resources in Italy. Thanks to favourable conditions between February and April, the Snow Water Equivalent (SWE) increased by 42% nationally. Nevertheless, this recovery was not consistent across the country: the Italian Alps benefitted from abundant snowfall while the Apennines and Southern Italy saw little snow, with a 12% deficit. This disparity highlights Italy's climate complexity, where opposite conditions coexist. While snowfall was abundant above 2000 metres, rising temperatures accelerated melting below 1800 metres. The snow cover accumulated during the winter is a vital water resource for the spring and summer, contributing to river flow. Early melting can reduce the amount of water available during the warmer months, worsening drought.

Monitoring snow dynamics in relation to water availability is essential for being able to forecast, prevent and promptly activate mitigation and adaptation action, and thus avoid conflicts, financial losses, energy deficits, and harm to agriculture and biodiversity. CIMA Research Foundation and LAB24 of Il Sole 24 Ore have set up the Snow and Drought Observatory – a web portal published on the Milan-based newpaper's website – to provide accurate information and scientifically sound data that are available to all. Every month it is updated with CIMA figures on the SWE (daily national data), the standard precipitation index (SPI; monthly national data), the standardized soil moisture index (SSMI; quarterly national data) and temperature anomalies (monthly national data).

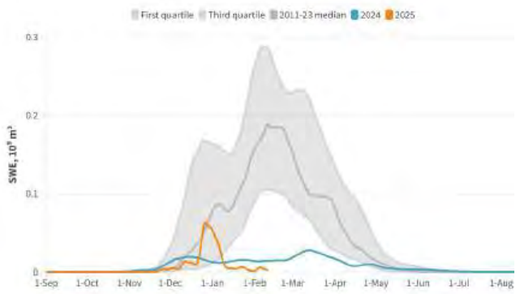
Presented in graphic forms that visually simplify information on national and provincial situations, the Observatory provides a straightforward and always up-to-date picture on the snowfall of today (and yesterday), which is 'the water of tomorrow'. This ensures clear information is available to everyone, and avoids misinformation while also enabling the real-time detection of critical situations so that intervention can be timely.

Drought is a growing threat, aggravated by climate change, and has global impacts that demand systemic approaches. For several years now CIMA Research Foundation has been applying its own models on this issue, through national, European and international projects (as in Bolivia or Sudan).
It has converted these models into operational water resource management tools that are based on data but primarily on impacts. As Competence Centre in the Italian Civil Protection System, we are a member of the Major Risks Commission for wildfire and water deficit risks, and we have included the drought risk also in governance and inter-regional planning projects.

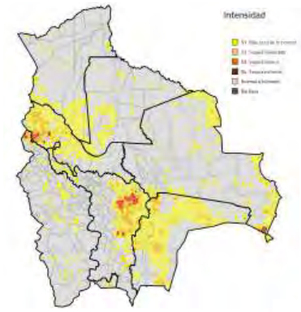
World Drought Atlas - Major drought events, 2022-2024



Total snow water volume Tevere river Italy



Monitor de Sequías de Bolivia



CONFERENCES OF THE **PARTIES**

COP29 AND **COP16:**
STILL DIVIDED BUT UNITED BY CLIMATE CHANGE

Alongside the African Union Commission, CIMA Research Foundation took part in COP29 in Baku, Azerbaijan, as a member of the Italian delegation, presenting the programme AMHEWAS (Africa Multi-Hazard Early Warning and Early Action System) and the myDEWETRA platform. Held from 11 to 22 November, the conference focused on critical issues, such as cutting emissions, climate funding for developing nations and adaptation to environmental emergencies.
For CIMA Research Foundation, the connection between civil protection, risk reduction and climate change is crucial, making COP29 a fundamental opportunity for debate and comparison on mitigation and adaptation strategies. This with particular attention to Africa – one of most vulnerable continents in climate change. Here CIMA Research Foundation conducted studies on people's forced displacement caused by natural disasters, and is an active party in the Early Warning for All programme, to create a continent-wide warning system for civil protection purposes. Contributing support in these initiatives, myDEWETRA stands as a key technological tool for forecasting and preventing risks. It supplies real-time integrated data, which are also used in Ethiopia, where the platform provides support in the project Integrated Water Resources Management (IWRM), which sees AICS, CIMA Research Foundation and the Italian National Research Council (CNR) engaged.
Ethiopia is an emblematic example of the water paradox: although rich in water resources and hydroelectric potential, it is enduring growing water scarcity, due to population increase and poor agricultural efficiency. Since 2000, the country's climate instability has affected over 80 million people, making them victims of extreme weather events and costing over $2 billion in damage.

The project focuses on some of the most vulnerable river basins: CIMA Research Foundation is involved in the hydro-meteorological observation network through installation of Acronet control units, in technical training for personnel, and in development of forecasting models. The project results include creation of a national monitoring room and a dashboard based on the myDEWETRA platform. The dashboard will display and integrate real-time hydrological data, enabling better resource management and a more effective early warning system. In addition, the platform will be interconnected with the Ethiopian National Situation Room that will be set up alongside the already operative Continental Situation Room – also in Addis Abeba – to expand the response capacity regarding climate disasters.

Climate paradoxes were also discussed during COP16, where CIMA Research Foundation attended the international launch of the World Drought Atlas – a global publication on the risks and impacts of drought – also curating a side event going into the topic in depth. Created in conjunction with JRC of the European Commission and the United Nations Convention to Combat Desertification (UNCCD), alongside the United Nations University (UNU) and Vrije Universiteit of Amsterdam, and coordinated by CIMA Research Foundation, this innovative tool provides data, maps and case studies to support resilience strategies.

Officially presented on 2 December at the inauguration in Riyadh, the World Drought Atlas aims to become a point of reference for governments and institutions, stimulating international debate on the best adaptation strategies. Drawing attention to its interdisciplinary vision and systemic approach to impacts, the volume shows that no country is immune to drought and that mitigation strategies have to be customized to respond to specific local contexts but must nonetheless be coordinated in order to be truly effective at a global level.

REAL-TIME EVENTS

BEING THERE, ALWAYS: MODELLING AND SATELLITE DEPLOYMENT

The series of floods that have hit Italy has underlined the growing need for accurate monitoring and adaptation and mitigation strategies to face climate change impacts.

In autumn 2024, Emilia-Romania experienced, for the third time in 18 months, a persistent low-depression vortex generated exceptional rainfall that resulted in flooding even in well-prepared cities such as Bologna. The temperature anomaly of the Adriatic Sea accentuated evaporation and increased the amount of moisture available for precipitation. The analysis conducted by CIMA Research Foundation showed great interaction between orography and atmospheric circulation, with rainfall concentrated on the Apennine mountains and hills and a high columnar liquid water content, which led to widespread flooding.

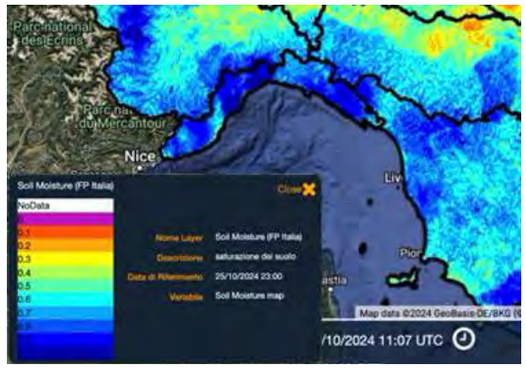
Shortly afterwards , in late October, heavy rainfall brought rivers to overflow and caused significant damage in the Arenzano (Genoa) and Cairo Montenotte (Savona) areas of Liguria. Heavy rainfall, added to a situation of already saturated terrain and above average sea temperatures, made the region vulnerable. A single month saw up to 700 mm of rainfall, equal to 50-60% of the annual average. This weather event highlighted the forecasting difficulties posed by the uncertain localization of storms. Nonetheless, the CIMA Research Foundation hydro-meteorological models had predicted a possible critical scenario, enabling careful real-time analysis and providing support to the Italian civil protection system.

The importance of sea temperature became clear. Anomalies exceeding recorded averages by up to 1.5° C contributed to intensifying the occurrence, once more showing the role played by climate change in escalating extreme natural events, which are no longer considered exceptional. The CIMA Research Foundation experts continued monitoring the situation, providing up-to-date data on rainfall and atmospheric conditions, until the low-pressure vortex gradually dispersed. Fundamental in these cases are satellite data capable of providing maps useful to orienting civil protection intervention. And CIMA Research Foundation made its contribution in all of these emergencies.

A crucial role is played in hydrological risk management not only by forecasting models but also by satellites. The Global Flood Monitoring (GFM) project, funded by the European Commission, enables the almost real-time global monitoring of floods through the use of satellite radar. Here CIMA Research Foundation is involved as project partner to improve the analysis algorithms to ensure ever more accurate and timely data.

One prominent aspect of the progress made by GFM is regarding the scope to access data on the EFAS European platform, facilitating information integration in early warning systems.

Likewise, the DTE Hydrology project sees CIMA Research Foundation use satellite data, to estimate key parameters such as precipitation and evapotranspiration, contributing to more efficient water resource management and prevention of extreme natural events.



TWENTY YEARS OF THE EARLY WARNING SYSTEM DIRECTIVE

LOOKING BACK TO MOVE FORWARD

The year 2024 marked two full decades of the Early Warning System Directive. This regulatory cornerstone shaping the organization and functioning of the forecasting and monitoring system for hydrogeological and hydraulic occurrences in Italy was first established in 2004. Advocated for by Bernardo De Bernardinis, with a decisive contribution from our late President Emeritus Franco Siccardi (1942 - 2024), the directive laid the foundations for more effective early warning management and better coordination between national and regional government in risk prevention.

The need to create a structured early warning system tragically emerged after a catastrophe that hit the Campania region so hard in 1998. The system has been fine-tuned and updated over the years, with the addition of decentralized operations centres, advanced monitoring tools and uniform language for early warning notifications. A turning point came in 2016, with the introduction of colour coding to immediately convey the level of event criticality, thus overcoming the discrepancy in terminology between the various regional authorities. Parallel to the regulatory evolution, scientific and technological development played a key role in improving forecasting models and monitoring capacity. Today artificial intelligence is opening up new perspectives.

In celebration of the anniversary of this milestone in our national system, the Italian Civil Protection Department and CIMA Research Foundation held the event 'Looking Back to Move Forward' – a moment for reflection and comparison on the history, impact and future of the Italian early warning system. Organized in Rome on 23 April, this day saw the involvement of sector experts, and rounded off on a keynote speech by Bernardo De Bernardinis, the initial directive advocate.

THE **HUMANITIES** AND **SOCIAL SCIENCES**

A **HOLISTIC APPROACH** TO **RISK MANAGEMENT**

On 23-24 September and 21-22 October, Rome stood host to a conference on the humanities and social sciences applied to civil protection, at the Italian Civil Protection Department offices. The event brought together academics, researchers and sector operators to explore new interdisciplinary approaches in risk management, with particular attention for the social, cultural and psychological aspects.

The meeting demonstrated how the humanities and social sciences can enrich the civil protection system, which is customarily linked with technical and scientific disciplines. Ninety-nine research projects by 280 academics were presented, grouped into three macro-themes: Responsibility and Care, Meeting the Other, and Acceptable Risk and Perceived Risk. Held in conjunction with CIMA Research Foundation, one goal of the conference was to consolidate a holistic vision of civil protection, in response to an ever more complex and interconnected society. Conventionally focused on the STEM disciplines, today the Italian civil protection system aims to integrate the humanities and social sciences as well, aware that risk management also comes through people's and communities' knowledge. The growing complexity of environmental and climate events dictates a broad and shared vision, one based on sustainability and collective involvement.

This conference stands as a departure point for structured collaboration between civil protection and social sciences. The Italian Civil Protection Department and CIMA Research Foundation are working to create a study and comparison community capable of responding to contemporary civil protection challenges with increasing effectiveness.

A **SOURCE** OF **INFORMATION**

RAI METEO AND **IL SOLE 24 ORE**

The teamwork built up over the years between CIMA Research Foundation, the RAI METEO public broadcasting service and the IL SOLE 24 ORE newspaper is as an excellent example of how scientific research into risks can be translated into tangible tools for citizens' awareness and preparedness. We consolidated these partnerships in 2024, with the goal of making weather and climate data immediately accessible, turning complex prediction models into clear information readily available to the public.

Alongside RAI METEO, we established regular and constant collaboration on social networks – with the younger generations as the main target – on common topics regarding climate and meteorological occurrences. Thanks to immediately understandable visual language that nevertheless does not neglect complexity and scientific accuracy, we have been able to analyse concepts and terms that are often distorted not only in the climate and weather field but also with regards to forest fires, marine biodiversity and hydrogeological risk. Instead, with LAB24 – the IL SOLE 24 ORE visual data area – we co-designed the already mentioned Snow and Drought Observatory, which we update every month with data from our snow and water resources monitoring, plus a comment on the Italian situation, further data and graphics. This is demanding work that, thanks to the IL SOLE 24 ORE reporters' professionalism, has become a reliable and constant source of information and is useful not only to the press but also to those people needing to make decisions based on real data and events.

In both cases, CIMA Research Foundation has consolidated its reputation as an authoritative Italian entity for research into the impacts of climate change and water-related risks, becoming a source of information and a voice of reference on the national and international scene.

EXE IN SPOTORNO

TRAINING EXERCISE FOR THE UAS NETWORK OF CIVIL PROTECTION COMPETENCE CENTRES

From 4 to 6 November 2024, the Spotorno and Bergeggi areas in the Savona province were central in an important national training exercise: EXE Spotorno 2024. Coordinated by CIMA Research Foundation for the Italian Civil Protection Department, the initiative involved experts, institutions and sector operators for three full days of practical training and theory, with the goal of improving intervention coordination and speed in complex emergency scenarios, also through the deployment of UAVs.

In a multi-risk context where various catastrophic events can unfold simultaneously – such as a landslide triggered by a flood – the use of drones enables immediate situation assessment, facilitating targeted and coordinated response.

The training exercise included practical field activities and opportunities for sector experts to compare ideas on the theory. Thanks to the partnership between CIMA Research Foundation, the Eucentre foundation, Liguria Regional Administration, the Italian Firefighters Corps and local administrations, emergency situations were simulated to improve response strategies. The deployment of UAVs in the Bergeggi protected marine area was particularly important: besides being used to assess infrastructural and territorial damage, they were utilized to monitor marine and coastal environments of high ecological value.

This training exercise was a fundamental moment in the journey towards ever more effective, high-tech civil protection safeguarding the local territory.

THE VOYAGE OF THE AMERIGO VESPUCCI

MONITORING CETACEANS

The renowned Italian Navy ship the Amerigo Vespucci embarked on a round-the-world voyage in 2023, providing scientific research with a unique opportunity. Thanks to a partnership between the University of Genoa's Marine Centre and CIMA Research Foundation, a protocol for the systematic monitoring of cetaceans was developed: this was tested during the voyage and taught to the crew. The initiative enabled valuable data on the conservation of marine species to be collected.

The voyage by the Amerigo Vespucci – labelled 'the loveliest boat in the world' – was a precious opportunity for marine biology research, also enabling protocols for observing sea mammals to be improved.

Paola Tepsich, head of the Marine Ecosystems Department at CIMA Research Foundation, presented the results of this work at the Italian Embassy in Darwin, Australia, in October 2024, later sharing them with a broader audience. Used primarily for training cadets at the Livorno Naval Academy, the Amerigo Vespucci also carried researchers in marine environment protection on board. CIMA Research Foundation was involved to structure and conduct specific cetacean observation and study activities.

During the stretch of the voyage between Rio de Janeiro and Buenos Aires, lasting three weeks, Paola Tepsich tested the protocols and trained the crew, in a fascinating and unusual experience not limited purely to the time at sea: during the months that followed, Tepsich trained up the new cadets for the Vespucci's first-ever crossing of the Pacific. The mission was a unique opportunity to collect fundamental data for research on cetaceans, especially in parts of the world less covered by scientific expeditions, which are usually carried out near coasts.

TWO **LEGAL TOOLS** TO **SERVE CIVIL PROTECTION**

WIKIPROCESSI AND **RISK COMMUNICATION**

CIMA Research Foundation's research in the legal field led to two major outcomes in 2024, confirming the foundation as a national point of reference for legislative expertise in civil protection matters.

The first was the open-access publication of "*La protezione civile nella società del rischio – 7.0*" on civil protection and the risk society. The CIMA Research legal scholars made significant contributions to creation of this book and pushed, alongside the Italian Civil Protection Department, for its publication. This collective work stands as a further update on the current situation in legal reflection on responsibility in civil protection, on the role of civil protection in the national context and, lastly, on the relationship between law and risk. For some time now our researchers have been contributing, through crucial considerations, to the development of regulations in this particular subject and to integration between law, science and operations, underlining the importance of a systemic, multidisciplinary approach open to the evolution of society and risks.

The second achievement is closely connected with the first and is the introduction of public access to the *Wikiprocessi* digital portal, the online legal observatory recording civil protection cases. It is able to monitor, systemize and analyse court cases – criminal, civil and administrative – where civil protection operators' legal responsibility has emerged. By allowing public access to this database, built up over roughly 20 years, the aim is to make knowledge of this legal sector more widespread also among other researchers – not just among legal scholars in civil protection law – and to contribute to boosting awareness on the topic of responsibility in this particular field of knowledge. The record of cases and the portal have played and will play a strategic role in prompting reflection by civil protection operators regarding their own activities and responsibilities. This prompting should decrease operation uncertainties, boost efficiency and see in good practices.

Lastly, Wikiprocessi stands today as an accessible and participatory tool that is useful to sector professionals, to entities involved in risk management and to researchers in general, encouraging more widespread and up-to-date knowledge of legal matters.

Both these results strengthen the CIMA Research Foundation mission to build bridges between research, practical operations and legislation, offering tangible tools to improve the efficiency and effectiveness of civil protection action.

ART AND **SCIENCE**

THE CLIMATE OBJECTIVE

Camera lenses have been turned to focus on climate change thanks to a joint initiative between CIMA Research Foundation and UIF (Italian Amateur Photographers' Union). The I-CHANGE project draws on the evocative power of images to document the effects of environmental crisis and possible adaptation solutions, turning research into a visual and moving experience.

Primordial elements such as water, air, earth and fire interweave in an eternal cycle of destruction and rebirth, while mathematics and physics offer tools for understanding and predicting these occurrences. Nonetheless, there are things the data cannot capture: emotion, awareness and an urgency to act. And this is where art comes into play, to express the complexity of climate crisis in striking images capturing onlookers' attention. These are the origins to 'The Climate Objective', a project where art and science intertwine, converting visual language into a means to bring awareness.

CIMA Research Foundation recognizes the value of art as a tool for dissemination and participation: it in fact uses its website 'Art and Science' to explore the connection between these two worlds, tackling global themes such as drought, flooding and diversity loss through accessible and moving language. The European project I-CHANGE, funded by the Horizon 2020 programme, has fully embraced this philosophy, promoting *citizen science*, where the general public is involved in science, and where an amateur photographer can become an active observer of the climate crisis.

The catalogue "The Climate Objective" lies at the heart of this particular initiative, and it brings together images offering powerful yet subtle narration on the effects of climate change. The response from amateur photographers was impressive: 550 participants from all over Italy contributed more than 1500 images, through regional competitions and activities. The project has given rise to exhibitions and local events, making photography a tool for learning and contemplation.

PRIAMAR: NEW DIRECTIONS FOR THE CLIMATE

A **SPACE** WHERE **SCIENCE, CULTURE** AND **SOCIETY CAN JOIN FORCES**

The time-honoured Priamar Fortress – an icon of Savona – is getting ready to take on a new role: it is set to become the nerve centre for tackling the challenges of climate change. Thanks to CIMA Research Foundation's relocation, Priamar Fortress will be converted into a living citadel of science and sustainability.

This ambitious project strengthens the synergy between CIMA Research Foundation, Savona Town Council and the University of Genoa, with the intent to build a multidisciplinary centre of excellence – open to the public – where research, training and the sharing of information all intertwine to shape a resilient and sustainable future. CIMA's relocation to Priamar stands as a unique opportunity to bring science closer to society, breaking down barriers between research and collective awareness.

The vision guiding this work by CIMA Research Foundation will be interdisciplinary: understanding and managing climate risks both require not only data and analysis of uncertainties, but also the active involvement of communities. Only through an integrated approach will it be possible to strengthen the capacity of local areas to predict and manage extreme natural events, converting difficulties into opportunities for resilience.

And with this new chapter, Savona places itself to the forefront in the fight against climate change, demonstrating that if research is shared and given value, it can act as the driving force for a safer and more sustainable future for all.

IN **REMEMBRANCE** OF **FRANCO SICCARDI**

SCIENCE COMBINING **MEMORY** AND **RESPONSIBILITY**

Franco Siccardi, professor, founder and President Emeritus of CIMA Research Foundation, left a legacy that interlaces science, art and social responsibility. In September, a month on from his passing, a commemorative event brought together colleagues, students and academic figures to remember the great work he achieved and his vision. Besides making a vital contribution to civil protection, Siccardi saw that art could be a complementary means for expressing science.

"*Knowledge is the tool to replace fear*". This statement is inscribed on his memorial stele at the CIMA Research Foundation premises. It encapsulates his beliefs and was the departure point for the title of the event held on 27 September: Science and Art, Responsibility and Memory. Members of the academic world and the civil protection sector played tribute to Siccardi, celebrating his way of interpreting science not purely as research but also as a practical tool for society.

Franco Siccardi did not limit his vision to engineering but knew how to recognize and appreciate the connection between science and other disciplines, such as art.

This connection lives today in the works by Beppe Schiavetta, who converted Siccardi's scientific explanations on occurrences such as flooding, drought and wildfire into images. The commemorative event alternated between moments of science and artistic performance. The Savona-based theatre company Cattivi Maestri acted out memories written by those who knew Siccardi, creating a bridge between memory and representation. An additional tribute was the video of Annapaola Bardeloni's performance based on Voltaire's poem on the disaster of Lisbon, presented during publication of Siccardi's last book, *Ataviche Paure*, in 2021.

Rounding off the day were the exhibition of Schiavetta's works purchased by CIMA Research Foundation and the unveiling of the stele dedicated to Siccardi. This monument symbolizes the connection between art and science, the importance of knowledge for facing risks, and the legacy of a man who knew how to merge professional commitment with human passion. The wording inscribed on the stele plaque – "*We had fun like cats*" – illustrates Franco's spirit in life and sharing of knowledge right until the end.

ANNUAL REPORT 2024

CIMA Research Foundation

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