



The International Emergency Management Society



THE INTERNATIONAL EMERGENCY MANAGEMENT SOCIETY Newsletter - ISSUE 31 - December 2017

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*Group Photo at
TIEMS 2017 Annual
Conference in Kyiv,
Ukraine*



*Student Helpers
and their
Professor
together with
TIEMS
Conference
Management*

The International Emergency Management Society

TIEMS continues its international development, and is spreading out its activity more and more worldwide, with members and chapters. New members and chapters add valuable expertise and cultural diversity to the TIEMS international network, which comprises of users, planners, researchers, industry, managers, response personnel, practitioners, social scientists, and other interested parties within emergency management and disaster response. This network constitutes a large international multidisciplinary group of experts, with different educational backgrounds and various experiences. Read more about this network and its activities in this newsletter.

Joseph Pollack
TIEMS Newsletter Editor

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MESSAGE FROM TIEMS PRESIDENT



First of all, I like to wish TIEMS members and friends worldwide Happy Holidays and a Prosperous New Year, with a hope that we can avoid the big disasters in 2018, and if it happens, that we are so well prepared that the consequences can be minor.

In the year 2017, which we soon are ending, however, climate and weather disasters have hit nearly every world continent, with flooding and monsoons in South Asia, hurricanes and major earthquakes in North America, landslides and droughts in Africa and a tsunami threat to Central America. In addition to this is vulnerability introduced by local conditions such as poverty, government corruption, poorly planned development, and environmental degradation.

These disasters and vulnerabilities demonstrate that we need to redouble our efforts to reduce the impacts of such events in the future. Robert Glasser of UN said in a statement that, "If we do not succeed in understanding what it takes to make our societies more resilient to disasters, we will pay an increasingly high price in terms of lost lives and livelihoods"

See the worldwide disasters, which ReliefWeb is actively monitoring at:

<https://reliefweb.int/disasters?date=201701-20180101#content>

TIEMS focus is on education, training, certification and policy in emergency management and disaster response, as we believe the best way to be prepared and building resilient societies worldwide is through improved and better education

about the risks the different communities phase, and learn how to act and help your self and others if a disaster strikes.

TIEMS international network of chapters and members have above focus, and this network is expanding continuously. In 2017, TIEMS has included Latin America and Caribbean (LAC) in its worldwide network, and one more chapter was added to TIEMS family, the TIEMS Philippines Chapter, which also will be the host of TIEMS 2018 Annual Conference to be arranged in Manila mid-November 2018.

This year's conference took place in Kyiv, Ukraine, with 19 nationalities adding value to an excellent technical program, and with social events showing the participants the best of Ukraine culture.

On the last day of the conference was arranged a trip and visit to the Chernobyl Exclusion Zone, in order to learn more about the nuclear tragedy that took place there in April 1986, more than 30 years ago. The visitors got an understanding of the threat of nuclear power, if used in war, which again is a threatening possibility, when listening to the rhetoric used by USA and North Korea. Let us hope that this is only rethoric exercizes on both sides and that common sense will prevail.



Oslo 22nd December 2017
K. Harald Drager
TIEMS President

Summary and conclusions of TIEMS 2017 Annual Conference are reported in the newsletter below.

TIEMS worldwide events in 2017 took place in India, USA, Philippines, China, Korea and Japan in addition to Ukraine, dealing with different aspects of emergency management and disaster response, and summaries from some of these events are found below, while the others will be reported in later TIEMS Newsletters.

TIEMS worldwide events are important meeting places for networking and building partnerships and collaborations, and in TIEMS Board meeting in Ukraine, the board decided to focus on the following fields, topics and activities in 2018 and beyonds:

- TIEMS QIEMD Certification -TQC
- TIEMS Academy
- The DRR Communication Platform
- The Global Study of Civil Protection
- TIEMS International Emergency Management Industry Group - TIEMIG
- TIEMS International Emergency Industry Group - TIEIG
- International RTD Projects

A brief introduction to these TIEMS 2018 Focus Areas are found below in my editorial, and further details of some of them are outlined in the newsletter.

TIEMS QIEMD Certification -TQC

TIEMS believes that education and training is the key to improved resilience worldwide, and TIEMS is therefore in the process of building up a comprehensive international education, training and certification program. TIEMS started with developing the concept of TIEMS Academy and TIEMS Qualification in Emergency & Disaster Management (QIEMD) Certification (TQC) in 2006.

TQC shall provide assurance that professionals and practitioners have a working knowledge of “Internationally Shared Understanding of Emergency Management and Disaster Response Elements, Qualifications and Terminology and Internationally Accepted Good

Practices”. The goal is that this will encourage and support the establishment of an essential and globally accepted standard of good practices in emergency and disaster management throughout the world.

TIEMS Academy

Related to tQC is creating an eLearning and Certification platform that will foster, across the international community, shared, common understanding of emergency management elements, standards, and terminology. This will be achieved by creating an online portal that will make emergency management educational resources, from established educational institutions and initiatives, broadly available to students worldwide.

The goal is that TIEMS Academy will feature royalty-free courses, royalty-free materials, and royalty-free emergency management tools with supporting documentation.

The DRR Communication Platform

This year marks the second year since the adoption of the Sendai Framework for Disaster Risk Reduction 2015-2030. The new global blueprint for DRR particularly aims to achieve “the substantial reduction of 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”. Particularly, it underscores the importance of strengthening multi-stakeholder engagement among government agencies, academia, private sector, civil society and other actors through cross-sector and inter-agency DRR community platforms.

TIEMS Korean Chapter has developed a web-based platform on DRR technology that can be leveraged by the TIEMS expert group (TIGE) to serve as a catalyst for transforming community resilience through information sharing and developing innovative and practical methods and technologies on mitigating disaster risks. The primary function of this website is to offer an easily accessible Q&A and discussion board for DRR experts to engage in through a dialogue regardless of time and space both during emergencies and at normal times.

The DRR Communication Platform was introduced and discussed during a workshop at TIEMS 2017 Annual Conference, and a brief description of the workshop is found in the newsletter below.

Global Study of Civil Protection

World Civil Protection Agencies are the first line organizations in disaster preparedness and response, and it is very important that these agencies are up-to-date on technology, systems and methods for efficient emergency management and disaster response. The World Bank has initiated a study to get an overview of the status of these agencies worldwide. TIEMS is one of the organizations, which has partnered with the World Bank to do this study, titled: "The state of Civil Protection in the World: Typologies, Good Practise and Economic Returns". The outcome of this study will be important learning for all working in Civil Protection, and for those responsible for the national funding of them.

TIEMS International Emergency Industry Group - TIEIG

TIEMS launced TIEMS Emergency Medical Committee (TEMC) in Chengdu in China in 2012, and this organization has developed to become an important international actor within emergency medicine, see:

<http://www.tiems.info/index.php/activities-events/task-force-groups/temc>

TIEMS have now taken an initiative to establish an International Emergency Industry Group, structured the same way as TEMC, and the structure and leadership will be established in 2018, and we expect the first exposure of this group through an emergency industry exhibition during TIEMS 2018 Annual Conference in Manila.

International RTD Projects

TIEMS has been involved in Research and Technical Development (RTD) projects since 2006, and at present TIEMS is involved in two EU projects as partner, the ASSET project and the HERACLES project.

The projects web-sites are:

ASSET:

<http://www.asset-scienceinsociety.eu/>

HERACLES:

<http://www.heracles-project.eu/>

ASSET is terminating at the end of this year, and the findings was summed up in ASSET final event in Rome in October this year, and an overview of the findings and conclusions are presented in this newsletter. HERACLES is mid-way in its development, and will be terminated in 2019.

RTD projects are important activities to improve systems, methods and technology in emergency management and disaster response, and TIEMS will continue to be a partner in RTD projects in the future and also take the initiative to launch projects ourselves which we feel will add value to better resilience world wide.

I hope TIEMS Focus areas will add value to create more resient societies worldwide and a thus a safer world.

Again, enjoy the upcoming holidays, and good luck in the New Year.



Have a good and interesting reading in the coming holidays!

***K. Harald Drager
TIEMS President***

MESSAGE FROM THE EDITOR

As 2017 draws to a close, let us reflect about our 24th year together at TIEMS. Indeed we have made great strides 4 years into our transformation towards an innovative organization! Take stock of this year's most exciting projects, policies, companies and forums, and look towards next year's improvement opportunities. Earthquakes in Mexico; flooding in South America; wildfires in the United States, Europe and Indonesia, and extreme weather events in the Pacific and the Caribbean and have tested the response of nations and affected our community one way or another. Protracted humanitarian situations inspire solidarity with the White Helmets in Syria; Blue Helmets in the Great Lakes region; civil protection in America, Ukraine and Japan; civil society in South America and the Arab World; and the scientific and public health community when their work is affected.

In 2017, TIEMS essentially validated its role in promoting better practices in emergency management. First of all, it welcomed new members in 1) USA, China, and the Ukraine distinguished by their public service and innovation in response; 2) Philippines, Afghanistan, Pakistan, Qatar distinguished by their commitment to public health; 3) South American chapters for their engagement with communities; 4) European Nations' leadership in CBRNE training.

As we return home from a global conference bravely held in Ukraine during the winter season, I would like to underline some associative resolutions. TIEMS has readied the TIGE community to respond to technology, man-power, and incident-based leadership requirements; established chairs for South America; held national consultations in Japan, China, the United States, the Philippines, and France; welcomed new members in particular our widely beloved Angeli Medina from the Philippines; distinguished leader Vilma Milmo; and a steady promising increases in memberships in China, Korea, Japan, the Philippines, Afghanistan, India, Pakistan, the Arabian Peninsula. In this issue I am super excited to introduce to the world China's leading applied simulation service providers.

TIEMS has pursued immediately pertinent development projects in China in public health; security, resilience, response, hospital management, public health response, and CBRNE training in Europe and the USA; EOC creation and management, international response and training at the IGO and national levels.

We partnered with the most exciting innovation events especially in China. As VR technology matures; the reduction in costs for building simulation centres for hospitals, EOCs, CBRNE, and specialised fire-fighting operations; the increased demand for training in mass casualty incidents can be met. Through this newsletter we have showcased the most exciting opportunities for technology transfer, learning, and international cooperation and trade to build the international emergency managers' society (TIEMS) of the future.

On behalf of all the tireless unsung volunteers that keep this forum going: Happy New Year. In 2018, join us in Manilla, Philippines for our global conference in partnership with the PHA the national doctors' association. Personally I end my year impressed by a jaw-dropping capability already bootstrapped in China - read ahead and let me know what you think. Stay up to date with the latest news by reading our newsletter. Read more for special **deals** and the most relevant **events!**

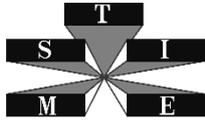


Joseph Pollack, www.publicinterest.network



THE INTERNATIONAL EMERGENCY MANAGEMENT SOCIETY INTRODUCTION

TIEMS – www.tiems.org



MISSION

TIEMS prepares the world for emergencies. We are a global forum for education, training, certification, and policy for emergency and disaster management. We do not respond to emergencies: we ensure that others are ready to respond. This is important internationally because some parts of the world otherwise have limited support for preparation.

As the international community discovers and develops new technologies, methodologies, and best practices, we offer conferences, ongoing forums, and training courses that rapidly and continuously spread the knowledge to every corner of the community. As policy makers grow to understand both the need for preparation and the support TIEMS provides, we expect to influence policy choices that strengthen cooperation among regional communities before a disaster strikes.

CHAPTERS

Chapters provide a regional focus for TIEMS activities. This is important because every region has unique circumstances and challenges, so there is no planning process that applies everywhere.

Currently we have chapters representing: Belgium/Netherlands/Luxembourg, China, Finland, India, Iraq, Italy, Japan, Korea, Middle East and North Africa, Nigeria and West Africa, Romania, United States of America, Philippines and Ukraine.

Each chapter is autonomous. Some of its members are also members of international TIEMS, and others are only members of the chapter, with local rules governing membership. The chapter establishes local activities and coordinates with the rest of TIEMS as needed.

The TIEMS Secretariat, located in Brussels, is available to the chapter for administrative support. The chapter reports annually to the Secretariat about chapter activities, plans and finances.

ACTIVITIES

- **International conferences, workshops and exhibitions**, held worldwide, focus on Emergency Management and Disaster Response topics
- **Research & Technology Development** projects support initiatives, coordination and participation
- **Task Force Groups** provide an international group of experts to assist with emergency operations worldwide
- **TIEMS Academy**, providing international education, training and certification programs in Emergency Management and Disaster response

MEMBERSHIP

As a member of the TIEMS, you are part of an international community of leaders and practitioners in emergency management, with diverse backgrounds in engineering, science, government, academics, military, and industry working together to make the world a safer place. Membership affords unique opportunities to learn, serve, and network.

Learn: From the multi-disciplinary, multi-national TIEMS community and through special programs.

Serve: By helping us in our mission to reduce the impacts of disasters and emergencies worldwide.

Network: With regional and international colleagues to develop valued personal and professional relationships, and enhanced opportunities.

You are welcome to join us as a TIEMS member.



K. Harald Drager
TIEMS President

TIEMS ORGANIZATIONAL DEVELOPMENT

Development of TIEMS QIEDM Certification

QIEDM = Qualification in International Emergency and Disaster Management

Prepared by: Angeli Medina, TIEMS QIEDM Certification Officer, MPA, BSN, CBCP, CHPCP, AMBCI, CEN

TIEMS QIEDM CERTIFICATION OBJECTIVE

TIEMS QIEDM Certification (TQC) shall provide assurance that professionals and practitioners have a working knowledge of “Internationally Shared Understanding of Emergency Management and Disaster Response Elements, Qualifications and Terminology and Internationally Accepted Good Practices”. The goal is that this will encourage and support the establishment of an essential and globally accepted standard of good practices in emergency and disaster management throughout the world. The government agencies, non-government organizations and program leaders in emergency and disaster management will by this certification be skilled in and demonstrate the technical competence and critical thinking ability, and be aware of the processes necessary in emergency and disaster management. This will enhance the confidence and trust between government leaders and non-government organizations in emergency and disaster management.

TQC shall be the acronym of the TIEMS QIEDM Certification.

TIEMS QIEDM CERTIFICATION PROCESS

The process for developing TIEMS QIEDM Certification is to review emergency and disaster response good practices from different countries of the world, and evaluate and select the best and relevant good practices to be demonstrated through the TIEMS QIEDM Certification process. Adherence to an internationally recognized certification process shall ensure that the TIEMS QIEDM Certification process conforms to the highest accreditation standard, and represents the best practices in certification.

The TIEMS QIEDM certification process shall involve both a review of a paper application and passing an examination in order to validate the skills and information provided by each applicant. The TIEMS QIEDM certification body seeks to be the provider of choice for emergency and disaster management leaders and specialists both nationally and internationally, and it works towards becoming a global standard for quality certification in emergency and disaster management.

TIEMS QIEDM CERTIFICATION BACKGROUND

QIEDM stands for Qualifications in International Emergency and Disaster Management, and the TIEMS QIEDM Certification concept has been developed within TIEMS since 2006.

TIEMS QIEDM CERTIFICATION STRATEGIC PLANS

1. Define who the customers or the market would be and what knowledge should a TIEMS QIEDM Certification imply, both international and local. A survey will be sent to the TIEMS chapters, and the concept will be discussed during the TIEMS Annual Conference to determine the content and spot the interest for an emergency and disaster management certification.
 2. Establish how the TIEMS Academy and TIEMS QIEDM Certification shall work together and establish two advisory committees, the TIEMS Academy Advisory Committee and the TIEMS
-

QIEDM Certification Committee, with representatives from each TIEMS chapter, which shall provide advice on the content and development of both TIEMS Academy and TIEMS QIEDM Certification.

3. Consider which courses are to be the teaching material for those taking TIEMS QIEDM Certification, and decide if these should be taught either through the TIEMS Academy on-line, or at cooperating universities or institutions, which could be certified to become TIEMS International Education Centers of Excellence.
4. Decide what background is necessary for those who want to be TIEMS QIEDM certified, and consider recognizing other certifications received from other reputable accreditation organization, e.g. ANSI, FEMA, ISO, DRI, BCI and accepting these as a pre-qualification to go directly to a pre-exam and later exam.
5. Develop an exam for certification, either to be done on-line or in the TIEMS Chapters or cooperating universities and institutions, and decide what the passing exam criteria would be.
6. Consider developing a pre-exam course so candidates can train on the requirements to pass the exam.
7. Decide the time-period before re-certification, maybe 3 years, or less, as technology develops so fast.
8. Consider incorporating the national or disaster management methodologies from different countries as reported by the 14 TIEMS Chapters, and set up an on-line resource library where the TIEMS Chapters can submit their white papers, articles, national protocol and policies on disaster management from their countries.
9. Cooperate with and use the outcome of the World Bank global research study on civil protection when deciding the framework of TIEMS QIEDM Certification.
10. Present and launch the TIEMS QIEDM Certification framework officially during the TIEMS 2017 Annual Conference in Kiev, Ukraine.

ORGANISATION OF THE TIEMS QIEDM CERTIFICATION DEVELOPMENT

The project leader for the development of TIEMS QIEDM Certification will be the TIEMS QIEDM Certification Officer, and a small project group will be established for following and guiding the daily work, with the following members:

- TIEMS QIEDM Certification Officer
- Chair of TIEMS Academy
- TIEMS President
- Selected members from TIEMS Board

Two advisory boards will advise the development of both TIEMS Academy and TIEMS QIEDM Certification, with members from each TIEMS Chapter, and selected members from the TIEMS board to represent areas where chapters are not established yet:

- TIEMS Academy Advisory Board
- TIEMS QIEDM Certification Advisory Board

The TIEMS QIEDM Certification Officer reports to the TIEMS Board.

TIEMS QIEDM CERTIFICATION FRAMEWORK

Mission

To promote the development of certification of internationally accepted global emergency and disaster management methodologies and good practices. Furthermore, to encourage collaboration in the spheres of scientific, critical thinking, humanitarian and economic activities relating to international emergency disaster management, preparedness, response and recovery.

Vision

The TIEMS QIEDM Certification will become the leading international emergency and disaster management certification program.

The TIEMS QIEDM Certification shall result in international agreement on the standardization of emergency and disaster management good practice.

TIEMS BASIC STRUCTURE SUPPORTING TIEMS QIEDM CERTIFICATION

- The International Emergency Management Society (TIEMS), with headquarters in Belgium, is an international non-profit, non-political, non-government organization registered in Brussels, Belgium.
- TIEMS has 14 TIEMS Chapters globally.
- TIEMS holds their meetings with global partners to discuss strategic plans on emergency and disaster management.
- The TIEMS President communicates with the leaders of different TIEMS Chapters to address strategic decisions as well as general operations of TIEMS Chapters.
- The TIEMS Board meets annually and as needed to address strategic issues and new member's state application to become TIEMS chapters.
- The TIEMS Academy plans to offer emergency and disaster management courses and materials that will enhance the successful completion of TIEMS QIEDM Certification.
- TIEMS QIEDM Certification plans to offer international certification based on internationally shared understanding of emergency management and disaster response elements, qualifications and terminology, and internationally accepted good practices in emergency and disaster management.

The ASSET EU Project Findings

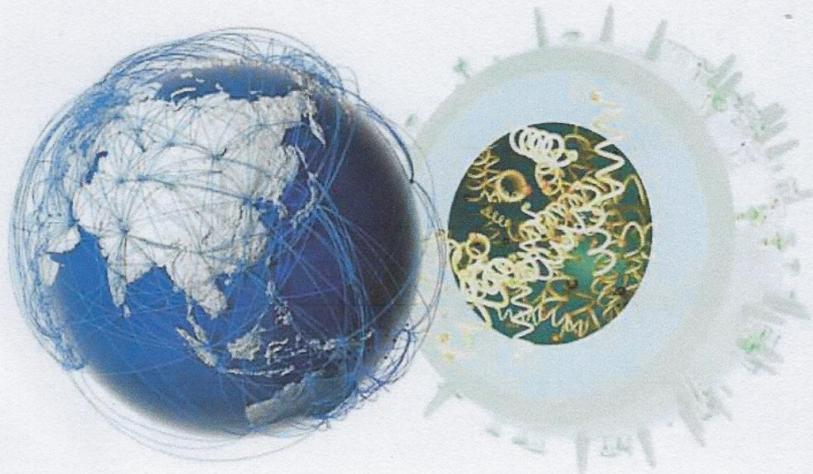
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In a globalized and interconnected world like the one we live in, infectious diseases can spread much faster and more easily than they used to do. The same happens with information, but misinformation as well, mainly through the web and the social networks.

Science and society are tightly interconnected as well, nowadays. Research has shown that issues relating science and medicine with society are very relevant in the spread of diseases. Nowadays people are no more willing to blindly accept orders from authorities: they want to understand what is happening to them and their families and have their say. Two-ways communication is therefore essential, but needed also to understand which are attitudes, fears, practical difficulties than the public or some specific groups are facing during an outbreak. Open access helps a fruitful exchange among scientists, accelerating a response. Cultural and ethical issues, i.e. related to the risk of stigma, can also have a strong impact on the spread of a disease.

ASSET (Action plan in Science in Society in Epidemics and Total pandemics) is an EU funded, 48 month Mobilisation and Mutual Learning Action Plan (MMLAP) project. It worked combining public health, vaccine and epidemiological research, social and political sciences, law and ethics, gender studies, science communication and media, in order to develop an integrated, transdisciplinary, strategy for pandemic and epidemic preparedness at



local, regional and national levels, so bringing societal issues into the field of preparedness and response.

CE Decision 1082/2013/EU on serious cross-border threats to health stresses that "inconsistent or confusing communication with the public and stakeholders such as healthcare professionals can have a negative impact on the effectiveness of the response from a public health perspective as well as on economic operators". The decision requires every three years all member states to provide the Commission with an update on the latest situation with regard to their preparedness and response planning at national level, in an intersectoral dimension. **ASSET** project provides research, experiences, proposals and tools that could be useful to incorporate Science-in-society issues into these plans.

Background

Many lessons have been learnt from 2009 A(H1N1) pandemic, followed by ebola epidemic in Western Africa in 2014. In both cases communication proved to be a weak point, which, in the first case, could put an effective response at risk, since the pandemic had been as serious as it was thought it would have been, and in the second case actually caused a higher burden of victims than it could have been.

According to the European Centre for Disease Prevention and Control (ECDC) in 2009 pandemic "... main challenge



was in dealing with the perception and communication of risks. In future, those involved in risk communication need to develop ways of better involving the scientific community and civil society. Their aim must be that risk is properly understood and trust maintained"¹. Previous related EU-funded projects, i.e. TELL ME and ECOM, have deeply studied what went wrong during 2009 A(H1N1) pandemic, showing that in that case communication was:

- mainly top-down, involving neither population nor healthcare professionals;
- did not succeed in dealing with uncertainty, notably in the first phases;
- lacked in flexibility, since their contents were not modified when the pandemic proved to be milder than it was supposed to be in the beginning;
- did not guarantee transparency, allowing rumours and charges of conflict of interest between health organizations and pharmaceutical industry.

A legacy of 2009 pandemic was therefore a decreased perception of risk about pandemic in the general population and this idea soon widened to all infectious diseases². The coincidence with the global financial and then more widely economic crisis occurring in those same years shifted the focus further from health issues to socio-economic threats.

As a result, at the moment, many people in Europe and USA keep on thinking that in 2009 WHO cried wolf, driven by pharmaceutical industry, that flu is a trivial disease and that pandemic flu is not a serious threat.

The recent response to Zika showed that the world is better prepared to emerging disease than it was in the past, but a lot must still be done. Gender and ethical issues raised by this crisis, affecting mainly pregnant women and their offspring, have not been adequately tackled yet.

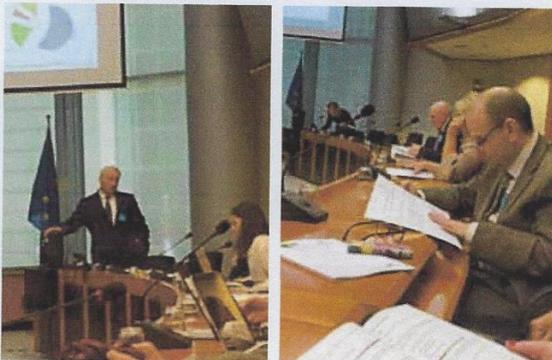
¹ European Centre for Disease Prevention and Control. The 2009 A(H1N1) pandemic in Europe. Stockholm, ECDC. 2010.

² Walter D et al. Risk perception and information-seeking behaviour during the 2009/10 influenza A(H1N1) PDM09 pandemic in Germany. *Eurosurveillance* 2012; vol 17: Issue 13

ASSET PROJECT



In this scenario, **ASSET** project developed an Action Plan including several initiatives and tools addressed to main groups of stakeholders. All of these actions were aimed at an interdisciplinary involvement of different actors, enhancing dialogue and mutual knowledge both through virtual means (website, social networks, call-conferences, community of practice, bulletins and newsletters) and personal meetings (High Level Policy Forum, local initiatives, Geneva Festival, workshops and conferences). A strong peculiarity of **ASSET** project was a simultaneous citizen consultation in eight different European countries (Bulgaria, Denmark, France, Ireland, Italy, Romania, Norway and Switzerland), with a full-day initiative of information, discussion and engagement of citizens in preparedness and response towards crises caused by emerging outbreaks, epidemics and pandemics.



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ASSET represents a model of actions for other projects and stakeholders, by highlighting **6 main targets**, that can be addressed with specific objectives by possible tools of actions on pandemic and epidemic preparedness and response. All the actors involved in the process of preparedness and response to epidemic and pandemics need to be involved, but language, tools and contents of these actions need to be diverse.

We have defined these 6 groups of possible stakeholders, even if some of them include different actors with different roles in epidemics and pandemics, and an actor may be included in more than one group, as well:

1. International, National and Local Organizations and Authorities;
2. Healthcare Professionals;
3. Scientific Community;
4. Industry;
5. Media;
6. General Public.

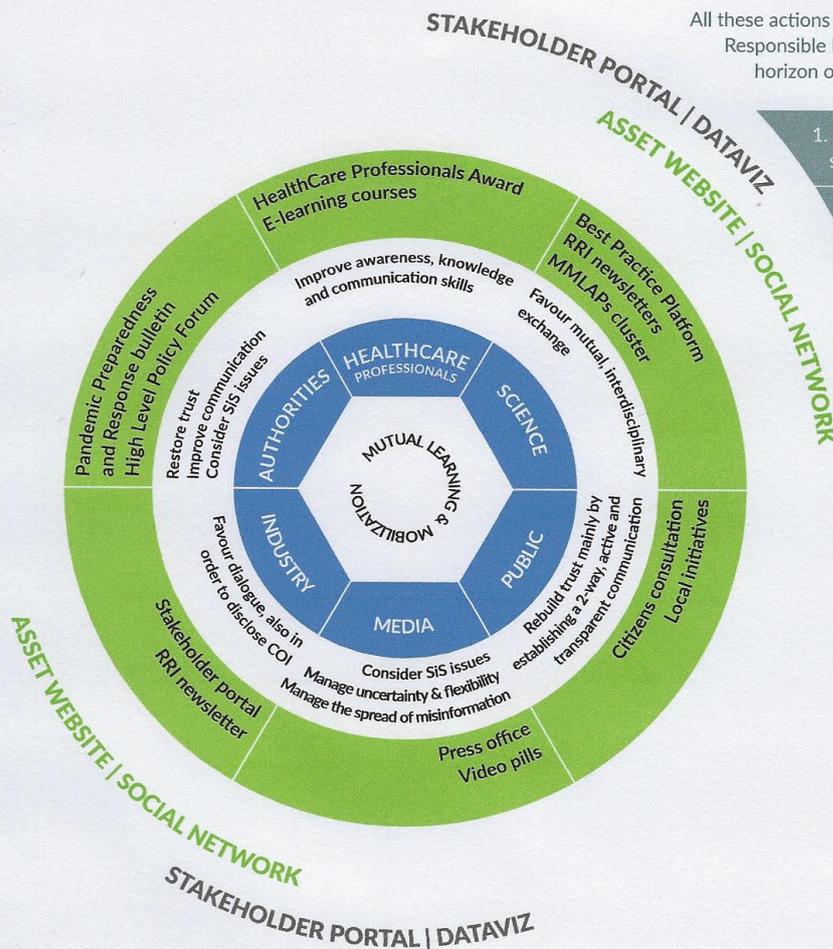


Toolbox

ASSET experts developed a virtual Toolbox, which mimics the real one carried by many workers. Such a box includes several instruments that have been used during the course of the project and made available on the website: from data visualization to a glossary of specific terms from different disciplines, from citizen participatory meetings to health reports by science journalists.



All these actions can be seen in view of 6 themes of Responsible Research and Innovation within the horizon of Science-With-And-For-Society:



1. governance of flu pandemics and other similar crises;
2. unsolved scientific questions and open access on scientific outputs regarding influenza and pandemic situations;
3. crisis participatory governance;
4. ethical, legal and societal implications of pandemics and epidemics;
5. gender issues in pandemics and epidemics;
6. risk of intentionally caused outbreaks.

THE GOVERNANCE

During 2009 A(H1N1) pandemic and ebola epidemic in Western Africa, the World Health Organization, as well as national and other supranational agencies, were harshly criticized for the governance of the crisis.

Also in further emergencies (such as zika epidemic in Latin America), the relevance of a two-ways, participated communication and of including gender and ethical issues in the governance of infectious crises became even more evident.

One of the main objectives of ASSET project was bringing Science-in-Society issues to the attention of policy makers, by different means.

A report on Governance

ASSET experts prepared a report on *Governance of Epidemics and Pandemics*, which reviews the issue using 2009 A(H1N1) pandemic as a case-history from three interrelated perspectives:

- **World Health Organization**, which had revised the International Health Regulations (IHR, 2005) and strengthened its position as a central global force with authority and accountability in the field of international health;
- **Pharma industry**: Conflict of Interests (CoI) with health authorities and its potential impact on the decision making process held by health authorities;
- **Media**, regarded as the "watching dogs" who should have monitored governance performance during the 2009 A(H1N1) pandemic, examined analysing through WHO and the Centers for Disease Control and Prevention (CDC) virtual press conferences during the pandemic.

The High Level Policy Forum

ASSET gathered 15 members from different countries (Norway, Sweden, Italy, UK, Denmark, France, Israel, Bulgaria, Luxembourg, Romania, Ireland and Greece) in a High Level Policy Forum in which hot topics about pandemic preparedness and response could be discussed.

Email exchanges and three personal meetings (2 in Bruxelles and 1 in Copenhagen) allowed members to tackle with issues such as participatory governance of epidemics and pandemics, vaccination hesitancy and ethical issues in pandemic preparedness planning.

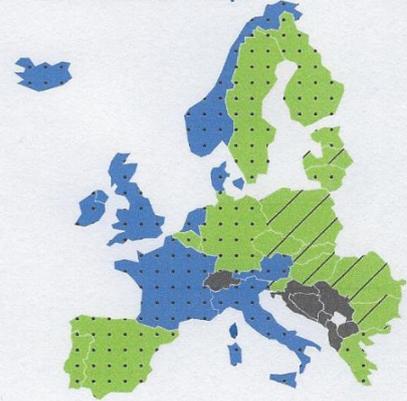
ASSET brochure: A Resource in case of Infectious Threats

By a leaflet addressed to European Public Health Authorities ASSET offered its research, expertise and tools to consider Science-in-Society issues in epidemic and pandemic preparedness plans, as requested by CE Decision 1082/2013/EU.

Share and move!

Six issues of a Pandemic Preparedness and Response Bulletin addressed to authorities and policy makers have been published, which include both activities and issues emerging from the project and other relevant news coming from other actors in the field.

Dataviz on compulsory vaccination in Europe



Measles vaccination coverage in EU/EEA in 2013.

Countries where vaccination is mandatory have been marked with a lined background, while those where the same vaccination is recommended have a spotted background.

Countries coloured in green have had an average higher vaccine coverage than the EU/EEA average – evaluated on all the countries over the period considered – while the coverage is lower than the average in the blue ones.

Meeting at the European Parliament

On 2017, 26th April, a Policy Workshop at the European Parliament presented ASSET project and the results of citizens' consultations organized within the project to members of Parliament of relevant committees.



SCIENCE: UNSOLVED QUESTIONS AND OPEN ACCESS

Following the proposals of the *Experts Groups on Science, H1N1 and Society*, designed by the European Commission, the ASSET project elaborated a **Reference guide of unsolved scientific related research questions** raised by the H1N1 pandemic and associated crisis management. Some relevant "unsolved questions" in the field of epidemics and pandemics related to society are:

- communicating science in presence of uncertainties, such as at the beginning of an outbreak;
- involvement of civil society to contrast the actual uni-directional decision processes with no feedbacks from the civil society;
- absence of compliance to the "epidemic intelligence framework" and low exploitation of data coming from new informal surveillance approaches;
- lack of involvement of GPs in the process of increasing the awareness of pandemics and negative attitudes of healthcare workers towards vaccines, for example;
- underestimation of the role of social networks to understand public perceptions and to disseminate information and increase knowledge and awareness;

- inter-disciplinary scientific approach to public health problems (e.g. scarce interest towards sociology, anthropology, behavioral mathematical models in epidemiology).

Paper series

Within ASSET project, a scientific paper series has presented various Science-With-And-For-Society issues in the form of an **open access scientific quarterly newsletter**. Experts in the ASSET consortium as well as invited authors have discussed them in the form of short communications on risk communication, social networks, national borders, democracy and human rights, etc.

Good examples

A section of ASSET website is dedicated to gather good and best "practices" on Science-in-Society related issues in public health research on epidemics and pandemics. This collection could help to:

- promote the good practices themselves so that they may become widely adopted;
- transfer knowledge of good practices among researchers, practitioners, institutions and organizations;
- develop best practice guidelines;

- validate best practice guidelines;
- disseminate and encourage adoption of "candidate best practice".

Best Practice Award

The relationship between science and society is of great relevance in public health, but many persons operating in this field do not often acknowledge its importance. One of ASSET aims was to raise awareness of these themes among general practitioners in Europe and the tool chosen for this purpose was an award to give recognition to health professionals working in the primary health sector who have implemented an activity or intervention to improve the quality of communication with their patients and the local community active participation.



INTENTIONALLY CAUSED OUTBREAKS

While **terrorism** is becoming a serious threat all over the world, there is a growing concern about the possible misuse of biological agents to cause outbreaks.

To understand and tackle the main governance problems posed by this risk, ASSET carried out an analysis of the history, state of the art and policy documents concerning intentional biological attacks in a report on *Intentionally Caused Outbreaks in democratic societies*.

The main challenges are:

- about the tension between secrecy and transparency;

- about the freedom of research and security;
- about citizen involvement.

National and international authorities need policy documents well known among relevant actors and ready to be used in case of emergency, after having discussed the security and ethical implications of any measure before the crisis.

Attitudes of citizens in the area are also in need of exploration, for example considering the risk of the dual use of research results and what information they want to have about intentionally caused outbreaks.

ETHICS AND LAW

A person with symptoms of a possible infectious disease who, afraid of being stigmatised, refuses to seek medical care. An institution that hides information or undisclosed conflict of interest, or that provides drugs and vaccines without accurate and justified priorities – thus fuelling distrust in authorities. The choice of restricting people's freedom by quarantine to prevent the spread of an infectious disease.

These are just some examples of how ethics is deeply entangled with pandemic and epidemic response.

ASSET addressed main stakeholders to consider these issues in the debate on epidemics and pandemics, and to promote ethical best practices in the event of public health emergencies.

A report on ethical issues

The first step in this direction is represented by the **Ethics, law and fundamental right report**, a document produced by ASSET experts to provide an overview on these topics and to discuss them in the light of public health emergencies, such as epidemics and pandemics. The first part of the report presents the international policy landscape on what constitutes fundamental human rights, both at European and world level. However, sometimes priorities and needs in a state of emergency may come into tension with ethical principles and societal norms. This is the reason why another section of this report is dedicated to those key values that should always be considered when addressing similar issues:

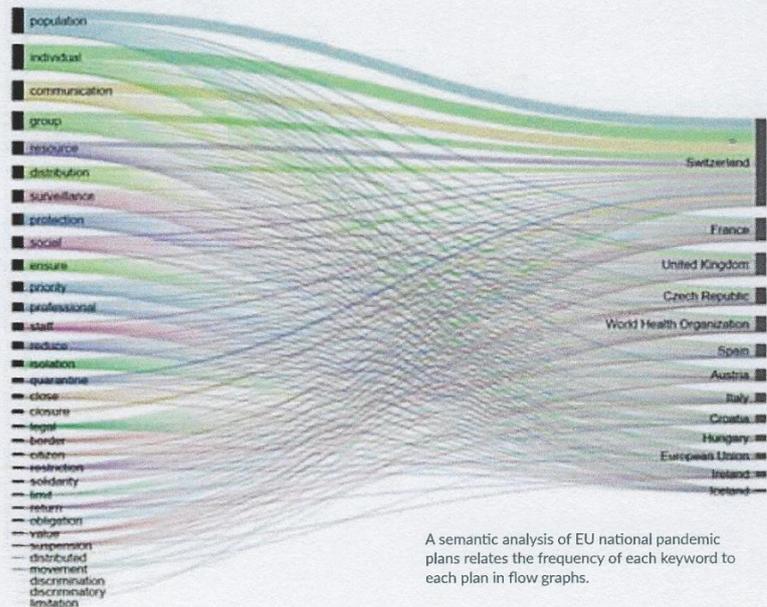
- restriction of personal freedoms;
- duty to provide care in pandemics;
- priority setting and resource allocation;
- international cooperation and global governance.

The final section of the report deals with two other issues with serious implications for pandemic preparedness and response. One is the risk of having individuals or entire communities that become the target of stigmatisation for a number of reasons, such as the perceived connection with the geographic origin of the outbreak in question, or their actual connection to perceived animal origins of an outbreak, and finally due to the fact that those individuals have actually become infected themselves. The other is the existence of vulnerable groups – such as pregnant women, children, people with disabilities, elderly people, the ill and the wounded – that should have priority access to first aid and any emergency evacuations.



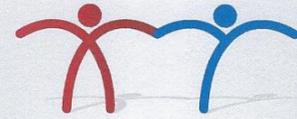
The analysis of national pandemic plans

How are European countries dealing with ethical issues in health emergency plans? This is the question that led ASSET experts to analyse **national preparedness and response plans**. Their aim was to assess how often ethical principles and their application were mentioned in national pandemic and epidemic plans. And their investigation revealed little concern for ethical aspects and a lack of discussion on ethical issues in most of the plans developed by European countries. Only four of them – Switzerland, United Kingdom, Czech Republic and France – have a dedicated section to this topic, while others, like Spain or Italy, just mentioned them without any further discussion. ASSET analysis may represent a useful tool to guide future drafters of pandemic plans, since it aims at encouraging debate on the necessity to update all national pandemic plans including ethical issues.



A semantic analysis of EU national pandemic plans relates the frequency of each keyword to each plan in flow graphs.

GENDER ISSUES



Gender refers to socially constructed roles, behaviours, activities, and attributes that a given society considers appropriate for men and women. Sex refers to the biological and physiological characteristics that define men and women, boys and girls. This is a biological fact, defined by XY or XX chromosomes.

Sex and gender have a significant impact on how people prepare or react to epidemics and pandemics, since they may lead to differences in risk perception, vulnerability, health behaviours or even clinical trials efficacy.

For instance, females and males differ in their immunological responses to seasonal influenza virus vaccines, with the former having higher antibody responses to influenza vaccinations. This is particularly relevant, since both vaccines and drugs are mainly tested on men, so that we cannot be sure that in women they have the same safety and efficacy. Another example is that of pregnant women, who are especially at risk during an epidemic, due to unique factors connected to their conditions.

ASSET project faced this issue in two ways: by collecting evidence about the impact of gender and age inequalities with respect to infectious outbreaks; by disseminating and promoting gender-specific and women-centred research on pandemics.

A report on gender issues

What awareness exists of gender differences in vaccination? What communication strategies have been employed for vaccination take-up from a gender perspective? What kind of information policies do exist for groups

with particular needs in terms of gender, such as pregnant women or older women?

These are some of the questions that drove a research performed by ASSET experts, described in the **Report on gender issues**. They analysed the available literature and conducted interviews with stakeholders from various areas concerned with pandemics, epidemics, and vaccinations. They found that there is an evident need for a more gendered approach to influenza epidemics and vaccination, and produced a series of recommendations to address these issues.

A platform for dissemination

Sex & Gender & Vaccination is a platform that gathers contents and articles from ASSET experts, aimed to disseminate and promote gender-sensitive and women-centred research on pandemics. In particular, it aims to spread information on flu pandemics related risks, notably for pregnant women and infants, preventive measures, antiviral drugs, vaccines and vaccination, and make information available to women to enable them to make informed and responsible decisions.



Sex and gender in clinical trials

It is often said that sex and gender differences are perceived as overlooked in research design and in clinical trials, even those on vaccines. According to the World Health Organisation (WHO), many reports of influenza vaccination rates as well as the safety, efficacy and effectiveness of vaccines around the world do not disaggregate data by sex. Some ASSET experts performed a study to compare participation rates of males and females in clinical vaccine trials, finding no significant differences. However, the fact that only a minority of the trials disaggregated data by sex and gender is a highly relevant finding, for it indicates that such a distinction was

not perceived as important. An interactive graph was also realised, to encourage viewers to estimate the percentage of

women involved in clinical trials and then comparing their guess with the real result.

PARTICIPATION | WEBSITE AND SOCIAL NETWORKS

Participation is one of the key element of democratic institutions. One of the aim of ASSET is to engage citizens in the debate on pandemic crisis prevention and management. Such a task requires several tools and a proper communication approach, which should flow back and forth between experts and the public.

The ASSET website

A project like ASSET could not work without a proper online platform. The ASSET website has been designed as a portal that not only gathers relevant resources and information on epidemics and pandemics, but also as a tool to facilitate dissemination and engagement. It is conceived as a hybrid between a magazine – with periodically updated articles that examine in depth some of the project topics – and an institutional website – with easy access to official documents, technical papers and recommendations from health authorities.

Aim of the website is to be approachable by all the different stakeholders ASSET

wants to reach, from general public to decision makers, from healthcare workers to scientists and journalists. The website collects several kinds of contents:

- the list of all ASSET partners;
- a series of articles produced by ASSET science writers and experts;
- a collection of video-interviews with experts in different fields related to epidemics and pandemics;
- link to ASSET social accounts;
- the Best Practice Platform;
- the Sex & Gender & Vaccination Platform;
- a collection of useful resources from scientific literature, health authorities and other related EU projects;
- all the products realized during the course of the project;
- a media section with a press kit, the project press review and all the press releases;
- access to the website analytics.

Trends in the number, type and geographical origin of visitors to the website are shown in a dedicated page, together with data from the Facebook and Twitter accounts. So far, the website has collected almost 15.000 unique visitors...

Website general report



ASSET in the social networks

The website alone was not enough to properly delve into the communication flow. A coordinated presence on social media was also necessary, since there users are constantly connected and interacting with one another, sharing ideas, files, and risk messages on a real-time basis, which enables them to evade institutional control of information. Exploring these dynamics is of great importance for a project interested in communication and engagement on a challenging topic like public health crises. ASSET has an account on Facebook, Twitter, and YouTube. ASSET experts used these channels to spread information but also to explore the public discourse online, for example to identify sources of misinformation and main opinion leaders (the so-called "influencers") on themes like vaccines or conspiracy theories. This was done both manually by experts in social media analysis and automatically through an algorithm designed for this purpose.



PARTICIPATION | CITIZEN CONSULTATION

ASSET aims to provide inputs for the development of effective policies on pandemic crisis, and to engage citizens in the debate of public health crisis prevention and management. In order to do that, it was thus important to gather citizens' voice and bring it to authorities, and to establish a two-way participated communication with the public. With these purposes in mind, **ASSET** experts organised a citizen consultation to allow citizens to discuss and express themselves on some of the key topics of the project:

- personal freedom and public health safety;
- communication between citizens and public health authorities;
- transparency in public health;
- access to knowledge.

The consultation took place in the same day in eight countries partner of the **ASSET** project and involved 50 citizens from each country.

Rules of the consultation

Two different steps are required in order for deliberative democracy to work properly: a first information phase, which needs to be complete, transparent, honest and balanced, and a deliberative phase, in which citizens may vote to manifest their opinion.

The citizen consultation was based on a method developed by one of the project partners, the Danish Board of Technology Foundation (DBT). Such a method was inspired by the one used for World Wide Views, a global citizen consultation initiative that was used in some relevant

global occasions like the COP15 in Copenhagen, the Biodiversity COP in Hyderabad, and the COP21 in Paris. On the same day, in each of the eight countries involved, all participants met face-to-face. Each of these meetings followed the exact same format and were divided into five thematic sessions, introduced by information videos. Citizens were then presented with a set of questions with pre-prepared answering options and, in groups of 5-6, deliberated on the questions, assisted by a trained table moderator. Then, finally, citizens voted individually on the questions and

their votes were collected and reported to the World Wide Views website. At the end of the day, citizens were also given the opportunity to write comments or recommendations to the national and European policy makers.

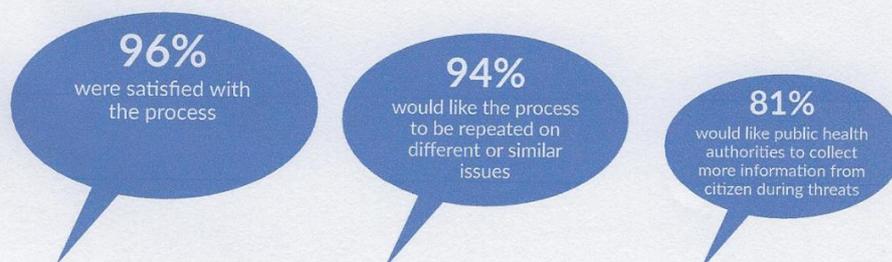
Results of the consultation

Citizens were very satisfied with the consultation and would like the process to be repeated on different or similar issues. They provided policy makers with clear demands and thought-provoking insights. They asked for more transparency in the work of health



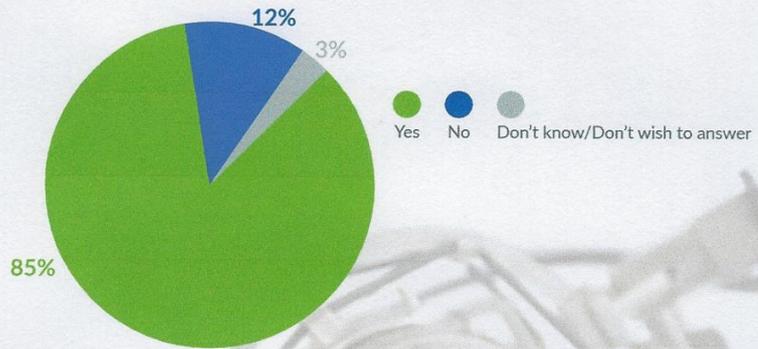
What is a citizen consultation?

The expression "citizen consultation" is part of an approach known as *deliberative democracy*, and refers to a wide range of activities that involve citizens in decision processes by asking them to express their opinion on specific topics. Born out of a growing concern for the environmental and societal consequences of industrialization in the 1960's, citizen consultations were mostly established in recent years. This is due to the rising awareness from politicians, scientists and stakeholders of the great opportunity, offered by these moments of discussion, of understanding population's viewpoints about subjects that strongly affect their lives.

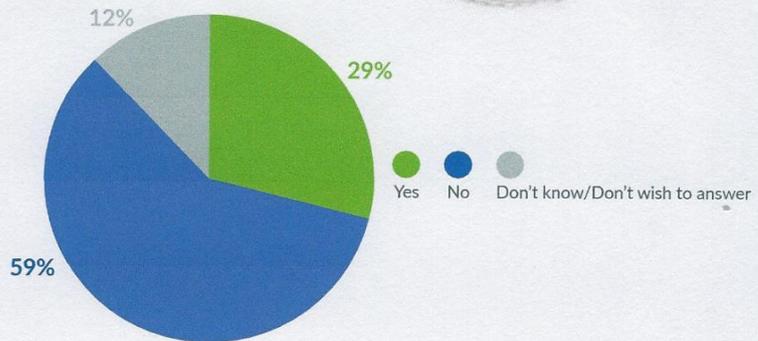


authorities and were not satisfied with the level of information provided during epidemic threats. Actually, less than half of the citizens were confident with information being withheld, even for security reasons by health authorities. Same goes for the satisfaction level during an epidemic threat. Some of the more remarkable results from the consultation included vaccination and information channels. While half of the citizens found mandatory vaccination as an appropriate tool for public health authorities during epidemic threats, more than eight-of-ten answered that it should be mandatory for health care workers. An insight that policy makers cannot overlook is that the citizen deemed internet as the least trusted information channel, and yet it is the one they consult first. When dealing with the principle of distribution of scarce resources like medicine during a pandemic outbreak, both men and women favoured giving priority to health care workers and other people working in important fields. However, women were more likely to prioritise high-risk groups than men. Citizens were also asked to encircle the most important words from the policy recommendations they wrote at the end of the sessions. These words have been translated and mapped according to the citizens' priorities through a specific analysis that produced a map showing that information, transparency and trust are of great importance for citizens. These results were presented at the European Parliament, in order to bring citizens' responses to the attention of public institutions and decision makers.

Should public health authorities make flu vaccination mandatory for health care workers in case of a pandemic or epidemic risk?



Are you satisfied with the information from public health authorities during epidemic threats like Zika?



74%
consider their family doctor as the most trustful source of information

82%
think that public services should be closed in case of a pandemic

88%
think that all relationship with vaccine manufacturers should be declared and publicly available?

PARTICIPATION | EVENTS

ASSET Summer School

Sharing and comparing ideas, learning different approaches, discussing and listening are all fundamental steps for a proper participation to develop. On these bases, **ASSET** organised three editions of a Summer School on Science-in-Society (SiS) related issues in pandemics. Aims of the courses was to exchange ideas about how to conduct and communicate research on these topics, and to address and critically discuss current discourses on research methodologies and findings, as well as on practice-based cases.

In all the three edition of the School, top experts or witnesses in the field gave interactive and participatory lessons, analysed specific and relevant case studies, and promoted the exchange of experience based on both study or practice. The **ASSET** Summer School was targeted to professionals with a background education and a working experience in several fields – medicine, public health, philosophy, social science, communication, health care, health economics, administration – and to PhD students undertaking courses of study in these areas.

Local initiatives

The response to a health emergency can vary from country to country, from region to region, based on a wide series of local factors. That's why **ASSET** has a global-scale purpose but also needs to be rooted at local level. Local initiatives were developed within the project, in order to experiment two-way communication at local level and to provide an opportunity



ASSET at the Verbier Festival

The Verbier Festival is the most famous classical music international event in Switzerland. On July 30th 2016, **ASSET** was there with a public workshop dedicated to Science and Music. A "Conference & concert" (open to the general public) was also organized, alternating talks about infectious diseases and a piano concert by the international artist Andrey Gugnin.

Final event

Four years of studies and results need to be summarised and properly presented. A concluding conference was thus organised by **ASSET** experts to show the project's outcomes to European stakeholders and engage them in the discussion about such topics. The event was designed to enhance advocacy and an intersectoral approach, with the idea of making it a practical and usable model for stakeholders and other possible users, and maybe also a sample for future similar actions.

In order to improve the degree of engagement and knowledge sharing, **ASSET** members also organised a **brokerage event** in conjunction with the conference. It was conceived as a moment in which coordinators of European projects, focused on similar challenges – from health to demographic change to wellbeing – or common methodology, can meet and present the most significant aspects of their activity.



to local actors and stakeholders to feed the action with their contents and to co-design the action itself (so being different from pure dissemination activities). Such events took place in Athens, Brussels, Bucharest, Dublin, Geneva, Haifa, Lyon, Milan, Oslo, Paris, Rome, and Sofia. For example, in Milan Malpensa airport we involved airlines staff, police, health officers in a workshop about communication and ethical issues in infectious crises.



CONCLUSIONS

In four years of work, **ASSET** has verified what a great challenge is to develop a common language among actors with different scientific and professional background. The exchange among partners and other stakeholders met in the course of the project has shown how fruitful this multidisciplinary dialogue can be and that it would deserve further efforts in order to better tackle with old and new emerging diseases.

Social psychology and risk communication, as well as computational, social network and big data analysis, can add important information to virology, microbiology, immunology and vaccinology so that preparedness and response can be improved in the future.

Despite the great effort needed to enhance a dialogue among different EU-funded projects, ten of them present and cooperate at the **ASSET** Brokerage event, on 30th-31st October 2017 in Rome.

The experience of **ASSET** citizen consultations has confirmed the willingness of general public to be involved in pandemic preparedness and response, and the importance of providing it with transparent and complete information before asking its opinion.

ASSET analyses have shown that lessons learnt from previous epidemics and pandemic about the relevant role of engaging society, considering ethical and gender issues and developing an inclusive risk communication are hardly put into practice even by most national pandemic preparedness and response plans. Steps forward will hopefully be taken following CE Decision 1082/2013/EU on serious cross-border threats to health, which requires every three years all member states to provide the Commission with an update on the latest situation with regard to their preparedness and response planning at national level.

Horizon 2020 with its Science-With-and-For-Society program acknowledges that there is still a lot of work to do. It is needed to allow "all societal actors (researchers, citizens, policy makers, business, third sector organisations etc.) to work together during the whole research and innovation process in order to better align both the process and its outcomes with the values, needs and expectations of European society".

A good job has been done by **ASSET** and other EU-funded projects, but there is still a long way to run before getting to a more prepared, resilient and fair society, also in front of infectious crises.

Workshop Introducing and discussing the DRR Communication Platform

Leveraging TIEMS Disaster Management Expertise to strengthen local community resilience through Global DRR Platform, Web-based Technologies for Disaster Risk Reduction

Background

This year marks the second year since the adoption of the Sendai Framework for Disaster Risk Reduction 2015-2030. The new global blueprint for DRR particularly aims to achieve “the substantial reduction of 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”.¹ Particularly, it underscores the importance of strengthening multi-stakeholder engagement among government agencies, academia, private sector, civil society and other actors through cross-sector and inter-agency DRR community platforms.

In response to such objective, developing measurable hazard and disaster baseline and indicators has been identified as a key follow-up action to ensure evidence-based monitoring and evaluation of local, national and regional DRR initiatives and programs. However, the *Sendai Framework Data Readiness Review 2017 on Disaster-related Data for Sustainable Development Report*² notes existing data gaps: poor data availability, quality and accessibility among UN Member States, as a remaining challenge in achieving the global agenda with only 87 countries reporting national readiness status as of February 2017. But in order for relevant stakeholders to formulate and utilize disaster related statistics and database, capacity building and information sharing are critical areas for improvement that have been repeatedly addressed since the 4th Asian Ministerial Conference on Disaster Risk Reduction (AMCDRR) in 2010.

Recognizing ongoing data-related issues, a Korean research team has developed a web-based technology and information sharing DRR platform. Showcased at the 6th AMCDRR and the 2015 Global Conference on DRR, the platform reiterated the need to formulate a DRR expert group equipped with practical knowledge and skills, serving as the technical advisory to national DRR committees in setting up national baseline and analyzing application and progress for building community resilience.

Objectives

The side event presents a web-based platform on DRR technology that can be leveraged by the TIEMS expert group to serve as a catalyst for transforming community resilience through information sharing and developing innovative and practical methods and technologies on mitigating disaster risks. The primary function of website is to offer an easily accessible Q&A and discussion board for DRR experts to engage in a thorough dialogue regardless of time and space both during emergencies and at normal times.

Workshop Structure

Following the platform introduction and demonstration, nominated TIEMS expert will share cases studies on efforts to build resilience community. Cases can be either from their country or another global crisis. Each case should address issues faced and efforts made to overcome/prevent a disaster. Then the presenter asks 2 or 3 insight questions (prepared in

¹ UNISDR. Sendai Framework. Accessible on <http://www.unisdr.org/we/coordinate/sendai-framework>

² UNISDR. Disaster-related Data for Sustainable Development: Sendai Framework Data Readiness Review 2017. Accessible on: http://www.unisdr.org/files/53080_entrybgpaperglobalsummaryreportdisa.pdf

advance) on the case to be discussed with participants. During the Q&A session, the group can discuss other possible solution or identify other similar cases faced in their communities (country, region, etc.). In closing, experts will discuss how TIEMS community can fully leverage the DRR web-platform to enhance knowledge sharing and networking.

Presenters may feel free to choose any cases on their expertise on the following DRR/DRM themes: community resilience, DRM cycle (mitigation, prevention, response, and recovery), technology, capacity building, policy making, law, awareness raising, education, etc.

Follow-up actions

In order for both presenters and participants to have a better understanding of the web-platform, they should study the web-platform prior to the workshop. All the presenters must upload their presentation materials and questions on the platform. Meanwhile participants can explore and review the platform before attending the section.

Login information (id & password) will be shared in advance to presenters and TIEMS expert attending the section. This will allow stimulating more insightful group discussion.

Duration (mins)	Description
10:30AM-10:40AM (10mins)	Overview of Global DRR Technology Platform <ul style="list-style-type: none"> ▪ Welcome Remarks (K. Harald Drager, TIEMS President) ▪ Introduction (Prof. Young Jai Lee, Dongguk University) ▪ Website Demonstration (Dongguk University Research Team)
90	Case Studies (Facilitator- Dr. H. Drager)
10:40-10:50	Presentation 1: Disaster Risk Reduction in the City of San Diego <i>Presenter: Dr. Thomas Robertson (USA)</i>
10:50-11:00	Q&A (<i>Presenter asks prepared questions to the audience</i>)
11:00-11:10	Presenter 2: The weakness of strong early warning systems. The case of Mexico <i>Presenter: Dr. Diego Otegui (Latin America & Caribbean)</i>
11:10 -11:20	Q&A (<i>Presenter asks prepared questions to the audience</i>)
11:20-11:30	Presentation 3: CERT and local community resilience in China, present and future <i>Presenter: Dr. Qu Guosheng (China)</i>
11:30-11:40	Q&A (<i>Presenter asks prepared questions to the audience</i>)
11:40-11:50	Presentation 4: Water Risk Assessment in Donbass <i>Presenter: Mark Battle, Head of UN Water and Sanitation Cluster, and Prof. Andre Samberg, TIEMS Ukraine President</i>
11:50-12:00	Q&A (<i>Presenter asks prepared questions to the audience</i>)
12:00-12:10	Presentation 5: Community Security in Armed Conflict Zones: Case Eastern Ukraine <i>Presenter: Rustam Pulatov, Component Lead, Community Security and Social Cohesion, Recovery and Peacebuilding, United Nations Development Programme in Ukraine</i>
12:10-12:20	Q&A (<i>Presenter asks prepared questions to the audience</i>)
12:20-12:30	Presentation 6: Assessment of Environmental Damage in Eastern Ukraine <i>Presenter: Dmytro Averin, OSCE project manager</i>
12:30-12:40	Q&A (<i>Presenter asks prepared questions to the audience</i>)
12:40-12:50	Ways forward & Recommendations on utilizing the DRR platform <i>Facilitator: K. Harald Drager, TIEMS President</i>

REPORTS & ANNOUNCEMENTS OF TIEMS EVENTS & CHAPTERS

TIEMS 2017 Annual Conference Summary and Conclusions

The passing year 2017 is remarkable. The 24th TIEMS Annual Conference and Assembly 2017 took place in Kiev in Ukraine on December 4-7, 2017. About 100 experts from North and South Americas, Europe and Asia participated three days in the technical sessions and after the end of the conference attended the guided tours to the Chernobyl exclusion zone: the Chernobyl nuclear power station and the Duga-3 radar installation which is known in the West as the Russian Woodpecker (Chernobyl-2) as well as the medical and emergency center in Kiev. There were 62 oral and poster presentations including the small exhibition. Experts exchanged the latest scientific results and other information about emergency management, disaster risk reduction and the increasing environmental risks in the Donbas region in the Eastern Ukraine.



The core group of the organizing committee, the TIEMS Board of Directors and the directors.



TIEMS president with the volunteers



The guided tour to the Chernobyl exclusion zone and the city of Pripjat



The guided tour to the Chernobyl nuclear power station, the reactor nro. 4 (behind)



This is how the 1st supermarket in the U.S.S.R. looks today. It was opened in 1970 in the city of Pripyat, which is about 10 km away from the Chernobyl nuclear power station.



The recipients of the scholarship from the Rotary Club of Eastern Helsinki (Finland), which supported the TIEMS Annual Conference 2017 in Kiev in Ukraine.

The conference was the success despite the fact that the host organization, the TIEMS Ukraine Chapter, had only 2 months to set up the event from 0, with the following topics :

- Information and Communications Technology and Geographical Information Systems solutions for Civil Protection and Emergency Management
- Geomatics in Education for Civil Protection and Emergency Management
- Environmental Risk Assessment by Means of Remote Sensing
- Peacebuilding in Ukraine
- Management of Abounded Areas of Long-term Man-made Disasters
- International Project Funding Mechanisms

General Chair: Andre SAMBERG, Professor of Practice, TIEMS International Program Committee (Finland), co-chairs: Major General (civil protetion) Ruslan M. BILOSHYTSKYI, Deputy Head of the State Emergency Service of Ukraine (Ukraine), Professor Oleksandr M. SUKHODOLIA, Head of

Department of Energy Security and Technogenic Safety of the National Institute for Strategic Studies under the President of Ukraine (Ukraine) and Major General (ret.) (Special Communication and Information Protection Forces) Professor Oleksandr V. KORNEIKO, Head of Cyber Security Department, National Academy of Internal Affairs of Ukraine (Ukraine).

Keynote speakers were:

- Ms. Oleksanda CHURKINA, Deputy Minister of Ministry of Social Affairs of Ukraine
- Mr. Oleksandr SUKHODOLIA, Head of Department of Energy Security and Technogenic Safety, National Institute for Strategic Studies of Ukraine under the President of Ukraine - Mr. Vitaly PETRUK, Head of The State Agency of Ukraine on Exclusion Zone Management, Ministry of Ecology and Natural Resources (Ukraine)
- Mr. Artur AYVAZOV, UNICEF's Director for Social Policy in Ukraine
- Mr. Mark BATTLE, Head of UN Water and Sanitation Cluster (presentation "Water Risk Assessment in Donbass")
- Mr. Rustam Pulatov, Component Leader of Community Security and Social Cohesion of UNDP Recovery and Peacebuilding in Ukraine ("Community Security in Pro-longed")
- Mr. Dmytro AVERIN, Project manager, The Organization for Security and Co-operation in Europe OSCE (presentation "Assessment of Environmental Damage in Eastern Ukraine by means of Donbass Environment Information System DEIS")

The conference covered all aspects related to Emergency Management, Cyber Risk Analysis, Virtual Training Means for First Responders and Resilience.

We had six workshops:

- Leveraging TIEMS Disaster Management Expertise to Strengthen Local Community Resilience through Global DRR Platform, Web-based Technologies for Disaster Risk Reduction
- Assessments of Vulnerabilities of Cyber in Power Grids and Critical Infrastructure: Case Ukraine 2015 - 2017
- EU-funded Horizon 2020 project "TARGET"
- EU-funded Horizon 2020 project "Driving Innovation In Crisis Management For European Resilience (Driver+)"
- TIEMS QIEM = Qualifications in International Emergency and Disaster Management
- World Bank Study On Typologies And Good Practices Of Civil Protection Systems In The World

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TIEMS - India Chapter - Progress Report as on October 15, 2017

Kailash Gupta's association with TIEMS started in 2009 as a doctoral student at University of North Texas. Kailash was awarded TIEMS Rohrmann Student Scholarship to facilitate presentation of his paper on "A New Philosophy in EOC Design: The Case of Rajasthan State in India" at the 17th TIEMS Annual Conference, Beijing, 2010. Kailash came to Annual Conference straight from Haiti after a quick response research and presented a paper on that and another on "Higher Education and Certification Opportunities in Emergency Management." Kailash paper on EOC design was awarded "best practice" paper.

After completing PhD in 2013, Kailash returned to India and at the instance of K Harald Drager, President, TIEMS started working to establish TIEMS – India Chapter. Indian legal system allows number of option to register a non-profit under different state and federal laws. After research, it was decided to form The International Emergency Management Society – India Chapter Trust. TIEMS – India Chapter applied for registration on September 17, 2014, under the Rajasthan Public Trust Act, 1959. TIEMS – India Chapter (TIEMS–IC) was registered on April 9, 2015, with registration number: 30 Jaipur 2015.

Progress report of TIEMS–IC is given below:

- TIEMS–IC participated in BIMSTEC DMEx – 2017. BIMSTEC is acronym for The Bay of Bengal Initiative for Multi-Sectorial Technical and Economic Cooperation of Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka, and Thailand. DMEx is acronym for disaster management exercise held from Oct. 11 to 14, 2017, around New Delhi.
- TIEMS–IC Proactively and pro bono worked since Sept. 2013 with Jaipur Municipal Corporation, 100 Resilient Cities, and other stake holders to get Jaipur (with three million population in 2011) selected as one of the 100 Resilient Cities, pioneered by the Rockefeller Foundation (<http://www.100resilientcities.org/cities/jaipur/>). A Memorandum of Understanding was signed on behalf of Jaipur by Mayor of Jaipur Municipal Corporation and Dr Kailash Gupta as Jaipur Point-of-Contact & Managing Trustee of TIEMS-IC with 100 Resilient Cities in Sept. 2015. Towards a Resilient Jaipur Agenda Setting Workshop organized by 100 Resilient Cities and Jaipur Municipal Corporation and hosted by National Center for Disaster Mitigation and Management of Malaviya National Institute of Technology, Jaipur was held on Thursday Oct. 5, 2017. Vulnerable people of Jaipur will be helped to become more resilient to sudden shocks and daily living stresses of physical, social and economic challenges.
- TIEMS-IC participated in launch program of Federation of Social Workers and Organization, Jaipur, August 26, 2017.
- TIEMS-IC was invited to participate in Effective Altruism Global 2017 Conference, San Francisco, USA, August 11-13, 2017.
- TIEMS-IC was invited to participate in 42nd Annual Natural Hazards Workshop, Broomfield, Colorado, USA, July 9-12, 2017. The India Chapter of The International Emergency Management Society, Pandemic Knowledge to Action, and Crisis Participatory Governance are included in Research and Practice Highlights of the Workshop website <https://hazards.colorado.edu/workshop/2017/abstract/index/research-highlight>.

- TIEMS-IC participated in Indian Institute of Technology (IIT) Bay Area Leadership Conference 2017, Santa Clara, California, USA, June 17, 2017.
- TIEMS-IC was invited to participate in UNISDR Global Platform on Disaster Risk Reduction 2017, Cancun, Mexico, May 22-26, 2017. TIEMS-IC was among the selected non-government organization invited to make Official Statement. TIEMS-IC Official Statement video and text are available at <http://www.unisdr.org/conferences/2017/globalplatform/en/programme/statements> and <http://www.unisdr.org/files/globalplatform/officialstatementatbottomoftiemsatu.pdf>. TIEMS-IC also made a presentation on Operation Resilience (see below) at the Ignite Stage available at <http://www.unisdr.org/conferences/2017/globalplatform/en/programme/ignite-stage/view/706>.
- TIEMS-IC was invited to participate in 2nd Indian National Platform on DRR, May 15-16, 2017, at Vigyan Bhawan, New Delhi as a prelude to the UNISDR Global Platform on DRR. Sarthak Handa architect of Operation Resilience was awarded by two of the Ministers of Govt. of India for his innovative start up idea. Operation Resilience is a not-for-profit start up idea. The project seeks to match demand and supply of goods and services by cloud sourcing existing platforms during disaster response. In an all India competition by National Disaster Management Authority of Govt. of India on innovative start up ideas in the field of disaster management, Operation Resilience was selected among 10 award winning ideas.
- TIEMS-IC participated in TiECon 2017, Santa Clara, California, USA, May 5-6, 2017, The World's Largest Entrepreneurship conference.
- TIEMS-IC participated in Indian Institutes of Management (IIM) America Pinnacle 2017 Convention on Artificial Intelligence, Mountain View, California, USA, April 29, 2017.
- TIEMS-IC co-organized with National Institute of Disaster Management and with support from six organizations a one full-day Workshop on Higher Education in Disaster Management: Challenges and Opportunities, New Delhi, Feb. 10, 2017.
- K. Harald Drager, President, TIEMS, Oslo, Norway and Prof. George Markowsky, Chair, TIEMS Academy and Prof. of Computer Science, University of Maine, Bangor, ME, USA visited India in Feb. 2017. The purpose of the visit apart from making presentations at the Workshop on Higher Education in Disaster Management: Challenges and Opportunity, Feb. 10, 2017, New Delhi was preparations for the Workshop, and networking with important stakeholders to promote TIEMS-IC.

A breakfast meeting was held on Feb. 08 with Mr Kamal Kishore, Member, National Disaster Management Authority, established under the Disaster Management Act, 2005 (having Prime Minister as Chairperson). TIEMS and NDMA exchanged information about their vision, mission, and activities.



Mr Kamal Kishore, Member, National Disaster Management Authority being capped with TIEMS – India Chapter cap by Dr. Kailash Gupta, Managing Trustee, TIEMS – India Chapter, on the left is Mr Harald, TIEMS President, and on right is Prof. George Markowsky, Chair, TIEMS Academy, New Delhi, Feb. 08, 2017

Harald, George, and Kailash then went to meet Mr Sanjoy Roy, Rahul Sen, and Suraj Dhingra of Teamwork Arts Pvt. Ltd. organizers of, inter-alia, world's largest free Jaipur Literature Festival (JLF). TIEMS-India Chapter is disaster management partners of JLF for two years.



Clockwise from left Rahul Sen, Kailash Gupta, Sajoy Roy, George Markowsky, Harald Drager, and Suraj Dhingra in a meeting at Teamwork Arts Pvt. Ltd. office, New Delhi, Feb. 08, 2017



Kailash Gupta capping Sanjoy Roy, Director, Teamwork Arts with the TIEMS-India Chapter cap on Feb. 08, 2017

In the afternoon on Feb. 08, 2017, the three TIEMS representatives met Prof. Vinod Sharam, Prof. of Disaster Management and Dr. Charru Malhotra, Associate Professor of e-Governance & ICT, Indian Institute of Public Administration (IIPA). Prof. Sharma is also Vice-Chairperson of Sikkam Disaster Management Authority. IIPA was set up in 1954 and Disaster Management Center at IIPA was set up 25 years ago. Later, after the enactment of Disaster Management Act, 2015, Disaster Management Center became National Institute of Disaster Management.

[Harald may insert photo with Prof. Vinod Sharma and Dr Charru Malhotra]

Center for Development and Disaster Management Support Services was one of the six supporters of the Workshop. Mr N M Prusty, Mentor-cum-Director of CDDMSS is also President, Humanitarian Aid International. HAI is based on Indian altruism and western humanitarian architecture offering bold and disruptive ways to combat poverty, hunger, and violence. HAI had organized Stakeholder Conference on Reinventing CSR, Hyatt Regency Hotel, New Delhi in the morning of Feb. 09, 2017. Harald, George, and Kailash heard Chief Guest Dr. Shashi Tharoor, Member of Parliament and Chairman, Parliamentary Standing Committee on External Affairs, Government of India, met Mr Prusty and networked with others.

[Harald may insert photo]

The next meeting was with Mr G. Padmanabhan, Senior Emergency Analyst and Officer in Charge, Disaster Management Unit, United Nations Development Program. Among the UN organizations, UNDP is the principal organization in the field of disaster management. It has three roles, education, conferences, and research. It has 13 communities of practices, known as Solution Exchange, and one of them is Disaster Management having about 3,000 members. It regularly issues newsletters and a recent newsletter mentioned about the TIEMS-NIDM organized Workshop also.



Harald, George, and Padmanabhan at UNDP office, New Delhi, Feb. 09, 2017 (Kailash was also in the meeting)

The next meeting on Feb. 09, 2017, of the TIEMS delegation was in the Indian Prime Minister's Office with Dr. P K Mishra, Additional Principal Secretary to the Prime Minister Narendra Modi. Dr. Mishra met with the TIEMS delegates for about 35 minutes. Dr Mishra is one of the world leaders in the field of disaster management. Gujarat State Disaster Management Authority was setup in the aftermath of 2001 Gujarat earthquake with Dr. Mishra as CEO. GSDMA was awarded 2003 United Nations Sasakawa Certificate of Merit for Disaster Reduction for Reconstruction and Rehabilitation. Dr Mishra explained to the international TIEMS delegation the Indian efforts in the field of disaster management from 1990s. He shared his frustration that despite lot of learning in the domain of disaster management, we are not able to implement the knowledge created. He also emphasized the role of emergency communications and disaster management at sub-district areas.

After the Prime Minister's office meeting the delegation had a luncheon meeting with Shri Anil Sinha, IAS (Retired), Sr. Advisor & Mentor, Hazard Risk Management and Climate Change Adaptation, Founder Vice Chairman of Bihar State Disaster Management Authority, Founder Executive Director of National Institute of Disaster Management, and Founder Programme Advisor, International Recovery Platform/ UNDP, Kobe, Japan. Shri Anil Sinha is also member of TIEMS-India Chapter. The discussions ranged on variety of subjects, including cultural aspects in disaster management.



Kailash Gupta, Harald Drager, Anil Sinha, and George Markowsky at Park Hotel, Parliament Street, New Delhi, Feb. 09, 2017

After the 10th Feb. Workshop, the delegation went to Jaipur on 11th Feb. Jaipur Pink city is 256 km south-west of New Delhi and capital of Rajasthan, which is geographically largest state of India. Jaipur has population of about 3.75 million. The delegation met TIEMS – India Chapter webmaster Mr Pawnesh Gupta and had a luncheon meeting with the Trustees of TIEMS – India Chapter Mr Gaurav Natani and Kailash Gupta.



Mr Gaurav Natani, Kailash Gupta, Trustees of TIEMS-India Chapter with George Markowsky and Harald Drager during a luncheon meeting at Jaipur on February 11, 2017

- TIEMS-IC was one of the NGO partners of 8th AU Jaipur Marathon 2017, held on February 5, 2017, in which about 60,000 runners participated, out of which 50 were supporters of TIEMS-IC and run with TIEMS-IC cap. TIEMS-IC is one of the nine partner NGOs of 9th AU Jaipur Marathon 2018 to be held on February 4, 2018 (<http://www.marathonjaipur.com/charity.asp>).
- The largest visibility of TIEMS-IC occurred as a Disaster Management Partner during the World's Largest Free 9th Jaipur Literature Festival, January 21-25, 2016, and 10th Jaipur Literature Festival, January 19-23, 2017. TIEMS-IC disaster management partnership and logo were displayed on big screens on all the six parallel venues having about 175 sessions, with about 275,000 footprints over five day periods. The sessions were also live broadcast on the Internet. The 11th edition of the Jaipur Literature Festival will be held during January 24-29, 2018.
- TIEMS-IC made a presentation at the Silver Jubilee Hamfest India 2016, November 5 – 6, 2016, Abu Road. Hamfest is annual gathering of amateur radio operators in India. You may hear the radio interview taken during that time from <https://archive.org/details/VisheshMulakatHAMKailashGuptaJaipur> with Kailash Gupta, who's Indian and American call sign are VU2KIZ and KG6SQR. The half an hour interview is in Hindi language.
- TIEMS-IC participated in 7th Asian Ministerial Conference on Disaster Risk Reduction 2016, New Delhi, November 2-5, 2017. Many members of the TIEMS-IC were session organizers, moderators, panellists, speakers, or delegates at the AMCDRR. In recognition of the DRR work being done by TIEMS, Government of India and UNISDR had allocated a booth at the DRR Exhibition of 7th AMCDRR 2016, New Delhi, November 3-5, 2017. There were number of visitors at the TIEMS booth. They were given TIEMS brochure, membership form, and explained about TIEMS activities.
- Mahila (= women) Housing SEWA Trust (MHT) is an autonomous organization promoted by the Self Employed Women's Association (SEWA). MHT is one of the eight winner of the Global Resilience Partnership Challenge, a joint initiative of Rockefeller Foundation, USAID, and Swedish International Development Agency. MHT sought TIEMS-IC help in organizing the Workshop on Local Coping Mechanisms for Integrated Climate Resilience: Opportunities & Challenges for Urban Poor in Jaipur, October 18, 2016, at Hotel Hilton. TIEMS-India Chapter with the Convener invited Mayor Nirmal Nahata to inaugurate the Workshop, which he did. TIEMS-IC also made a presentation.
- TIEMS-IC was Knowledge Partner of International Conference on Disaster Risk Reduction, March 26 -27, 2017, Kolkata
- National Disaster Response Force invited TIEMS-IC for National Workshop on Response Capability, March 7, 2016, Vigyan Bhawan, New Delh.
- TIEMS-IC Honorary Secretary Neelay Srivastava presented a paper at the 2nd World Congress on Disaster Management, November 19-22, 2015, Visakhapatnam organized by Disaster Management Infrastructure and Control Society (DMICS) in collaboration with the Government of Andhra Pradesh state and supported by various local, national, regional, and international organizations. TIEMS was one of the knowledge partners and collaborating organization of the Congress and TIEMS logo was also on the Congress website.

- TIEMS-IC presented a paper at the 6th Annual Conference of the International Society for Integrated Disaster Risk Management TIFAC-IDRiM 2015, October 28-30, 2015, New Delhi
- TIEMS-IC presented a paper at 22nd TIEMS Annual Conference, Rome, September-Oct. 2015. Kailash also chaired one of the two morning parallel sessions.
- TIEMS-IC responded to neighbouring Nepal earthquake of April 25, 2015. Kailash reached Nepal a day after earthquake and remained for 19 days. He responded to the catastrophe in many areas and was part of a relief team. He participated in number of UN Cluster Meetings and was with Indian National Disaster Response Force teams also. He was particularly deployed by Ministry of Health and Population, Government of Nepal for disaster response. He worked with Forensic Department of the Tribhuvan University Teaching Hospital, Kathmandu for mass-fatalities management.
- TIEMS-IC proactively designed for the first time in fifty years history of Indian Institute of Management, Ahmedabad an elective course on disaster management and got its approval. Indian Institute of Management, Ahmedabad is ranked number one among Indian business schools and according to Euromoney magazine toughest to get admission in the world in terms of number of applicants per available seat. Kailash taught during the academic year 2014-15 the course which was taken by 34 MBA, MBA Executive, and exchange students from abroad

Announcement of International Conference for Decade Memory of the Great Wenchuan Earthquake

“International Conference for Decade Memory of the Great Wenchuan Earthquake with 4th International Conference on Continental Earthquakes May 12-14, 2018, Chengdu, China” will be held by China Earthquake Administration (CEA) in May 12-14, in Chengdu, Sichuan Province. You are warmly welcome to participate this great conference in China.

The theme 3-3-1 to theme 3-3-8 are concerning with the emergency management, response, capacity buildings, USAR certification, innovation of emergency technology, EOC and etc.. The theme is co-organized by INSARAG Secretariat of UNOCHA and The International Emergency Management Society (TIEMS). The main Convener is Prof. QU Guosheng, Experts Group Leader of USAR of China Earthquake Administration (CEA), and Vice President of TIEMS. The Co-conveners are Mr. Winston Chang, Secretary General of INSARAG Secretariat of UNOCHA and K. Harald Drager, President of TIEMS.

Please login the conference URL for more information about the conference:

<http://www.4thicce.com>

Scope of Conference



Dear Friends,

It has been nine years since the great earthquake of Wenchuan, Sichuan, southwest China. The impact of that devastating event on either natural science or social sustainability was so important that a decade review will be of no doubt worth for further development. Continental earthquakes, a mixture of intra-plate and inter-plate earthquakes, forms the major threaten to human society not only along the Eurasian seismic belt but also in continental America, Australia, and Africa, among other places. Understanding of the seismogenesis, preparation, and occurrence of continental earthquakes, one of the challenging scientific issues in Earth science, plays an essential role for the reduction of the risk of earthquake disasters as well as the post-earthquake secondary disasters, calling for international exchange and cooperation. For about every decade, China Earthquake Administration (CEA), in collaboration with the academic and/or administrative organizations both in China and abroad, organizes the International Conference on Continental Earthquakes (ICCE). In connection to the 4th ICCE, the International Conference for the Decade Memory of the Wenchuan Earthquake, organized by CEA in collaboration with several national and international organizations and projects such as IASPEI, UNISDR, IAEE, ISC, ASC, ACES and NSFC, among others, will be held on May 12-14, 2018, in Chengdu, Sichuan. The Conference will be focused on the exchange and cooperation in earthquake science and technology, countermeasures for earthquake disaster risk reduction, earthquake emergency response, and post-earthquake rescue, relief, and recovery.

We look forward to your participation in this Conference, and hope that this Conference will provide all of us with a good opportunity for fostering innovative ideas and productive cooperation.

With best regards

You can find more information of the conference, if you have any questions, pls contact:

- QU Guosheng, Email: qgsh@263.net, Mobile: +86-13801225593
- XU Jianhua, Email: nerss_xjh@163.com, Mobile: +86-13718531750

ANNOUNCEMENT OF INTERNATIONAL EMERGENCY MANAGEMENT COURSES & EVENTS

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We are excited to announce our new [online MSc Disaster Management: Resilience, Response and Relief](#) which is developed in collaboration with the [School of Nursing \(SN\)](#) at [The Hong Kong Polytechnic University \(PolyU\)](#).

Underpinned by a multidisciplinary approach, the programme enables graduates to conduct theoretical and practical analysis as well as evaluation to support disaster management and humanitarian action in global health contexts.

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HCRI's other courses include [humanitarianism](#), [humanitarian aid](#), [disaster management](#), [global health](#), [peace](#), [conflict response](#) and [international disaster management](#).

Revolutionising the UK's response to international disasters

An example of HCRI's inter-disciplinary research with life-changing impacts:

A generation of Haitians may needlessly have lost limbs thanks to a lack of specialist medical training in those who responded to the 2010 Haiti earthquake. University of Manchester research has since ensured future overseas disasters can benefit from a more effective medical response from the UK.

Global problem: international inequalities in medical standards

Humanitarian responses to international disasters are invariably well-intentioned but can have unforeseen negative consequences. One doctor attending to the 2010 Haiti earthquake victims estimated that the vast majority of those coming in with crushing injuries underwent amputations, partly as a result of infections, many of which it is now believed could have been avoided.

Professor Bertrand Taithe, a historian of humanitarian aid who is based at our Humanitarian and Conflict Response Institute, was directly involved with Handicap International and the UK evaluation of the Haiti relief effort in 2010, funded by the Department for International Development (DFID).

His qualitative assessment brought into sharp focus the Haitian perspectives on the standards of surgical interventions and poor levels of documentation, coordination and resource allocation in the international effort. These were issues that Professor Taithe had seen surface repeatedly in his prior research on the history of humanitarian responses to disasters and wars.

Manchester solution: supporting high quality medical interventions

Our Humanitarian and Conflict Response Institute is ideally placed to bring together the social sciences and medical sciences, in a space where researchers and NGOs can discuss relevant concerns and issues, to understand where research questions can impact on practice.

Professor Taithe says: "My research on Haiti gave crucial evidence of the urgent need to change humanitarian practices. It allowed me to feed through the work of Professor Tony Redmond, with whom I worked very closely, into relevant debates at the World Health Organisation (WHO) on foreign medical teams and the minimum data needed for health workforce registration.

"Together, our research brought about the breakthrough for the creation of the UK International Emergency Trauma Register (UKIETR): a body to help UK health professionals deliver a coordinated medical response during rapid onset of overseas disasters.

He added: "For me, this Manchester breakthrough for addressing global inequalities in medical standards was about Manchester researchers working together for the greatest good."

The UKIETR has now expanded into a larger register that encompasses trauma, medical and public health professionals, and acts as an interface between volunteering, training and being effectively deployed. It lists specialists, trains them for work in resource-poor environments and austere working conditions, trains them in specific responses and then makes them available to NGOs or state responses.

The University of Manchester's Professor Tony Redmond established these registers, which are hosted within UK-Med - an NGO founded by Professor Redmond in 1995 which is located at the University.

Life-changing impacts

The creation of a UK International Emergency Trauma Register has provided:

- a highly effective way for the UK to share its NHS expertise with the world and deploy trained and fully prepared staff to complex emergencies;
- a pioneering instance of a new approach to better structured, evidence-based, thoughtful and respectful engagement in the problems and crises of others;
- a route for UK medical professionals to develop a lifelong engagement with volunteering that responds to real needs and is supported by training and education.

Find out more

Read the research papers:

['Disasters and a register for foreign medical teams'](#), The Lancet, Vol 377, Issue 9771, 2011
['A qualitative and quantitative study of the surgical and rehabilitation response to the earthquake in Haiti, January 2010'](#), Prehospital and Disaster Medicine, Vol 26, Issue 6, 2011

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EMERGENCY INDUSTRY PRESENTATIONS

Hirain-Boya Emergency Science & Technology Co.,Ltd: Company Introduction



Hirain-Boya has established a strategic cooperative relationship with the International Emergency Management Society(TIEMS) , Digital Disaster Reduction and Emergency Management Research Center, IDC, PKU and International Emergency Industrial Technology Innovation Strategic Alliance(IEITISA). Under the guidance of experts both at home and abroad, Hirain-Boya is committed to enhance the safety awareness and the ability to prevent and cope with emergencies among the public, and actively promote the rapid development of the emergency industry and disaster reduction cultural undertakings, which provides knowledge reserves, material security, technical support and professional services for the safety and stability of the community.

The core business of the company involves culture transmission of disaster prevention and mitigation, emergency safety experience, disaster coping education and training, which includes hosting international emergency exhibition and symposium, creating emergency products and technology trading platforms, developing emergency VR & AR education products, implementing emergency safety experience projects and carrying out disaster coping education and training.

Hirain-Boya focuses on cultural tourism scenic spots, amusement theme parks, creative consulting of theme parks, management planning and project operation services. The company brings together the talents of emergency, disaster prevention, security, education, entertainment, art, exhibition and tourism, relying on the core concepts of disaster prevention, disaster reduction and emergency safety, and using new technologies such as 3D, 4D, VR, AR and NFC and entertainment means, which has successfully completed a number of emergency projects both at home and abroad and is the leading and only "one-stop" service enterprise with the combination of consulting planning, creative design, construction projects, scenarios, landscaping sculpture, art production, multimedia technology integration, IP video customization and operation management, etc.

Core Business

The company disseminated the culture of disaster prevention and reduction by holding all kinds of emergency industry exhibitions and seminars on emergency disaster reduction, establishing disaster prevention product trading platform as well as promoting emergency VR teaching products.



The company uses scenario construction, simulation, three-dimensional film, holographic projection, video image, virtual reality, augmented reality, near field wireless communication, intelligent wearable, somatosensory technology and other core technologies, which focuses on providing the most professional consulting, planning, design, construction, operation and management services for disaster prevention, disaster reduction and emergency safety theme pavilions and large experience projects.



Developing online information interactive education and offline practical experience training; organizing various types of disaster response education and training; teaching knowledge of disaster prevention and preparedness.



Authoritative experts

K. Harald Drager (Norway)



The chairman of TIEMS

One of the founders of TIEMS
 General Manager of Norway QUASAR Investment Co., Ltd
 Control Engineering Master of Norwegian Polytechnic University
 Industrial Engineering Master of Purdue University

Yukio Fujinawa (Japan)



Chairman of the disaster warning Committee of the TIEMS

The chief researcher of the Crustal Evolution Research Laboratory of the National Center for disaster prevention and research, Japan

Special lecturer of the Institute of seismological engineering and the Institute of earthquake engineering and architecture

Interim lecturer of the JICA disaster workshop in Japan

Served as CEO of real-time earthquake information group

Incumbent executive technical officer of Mieruka Co., Ltd.

Chief technical adviser of Tenacity Community Development Organization (ODRC)
TIMS Japan Branch Auditor

Ph.D. in Science, University of Tokyo Department of Physics,, the main storm of development and evolution

Jean-Paul Monet (France)



Director of TIEMS in European

French civil department and regional security adviser for biochemical explosions
Senior lieutenant colonel fire officer

Elite team

Hirain-Boya brings together excellent experts and design teams both at home and abroad. Reling on its culture foundation and creativity, Hirain-Boya has become an international first-class expert in emergency and disaster reduction and children's theme creative designs, which highly practices the organic unity of corporate profitability and social responsibilities. At the same time, in the field of creative consulting and theme packaging, it focus on the project operation, management planning and creative consulting services for cultural and tourist attractions, amusement and theme parks.



Hirain-Boya Emergency Science & Technology Co., Ltd--Elite team in China



Hirain-Boya Emergency Science & Technology Co., Ltd--Elite team in Korea

Application of patent products

1、7-min-ride into disaster



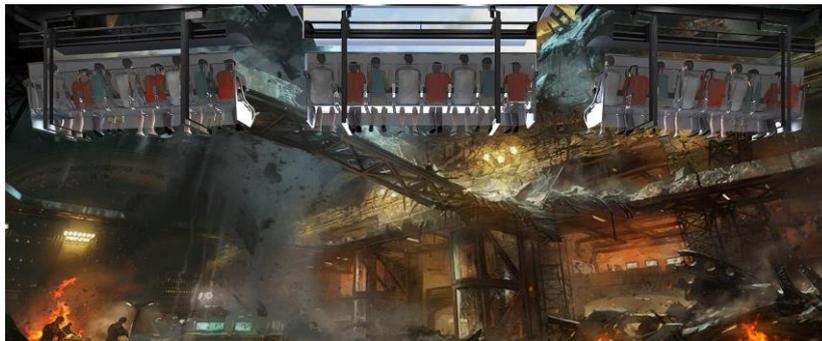
This international first-class project was originated by Hirain Group. Combining major disasters with the dark-ride technology, we allow the visitors experience the devastating force of those disasters. The visitor will go through seven disaster scenes include earthquake, floods, tsunami, plague of insects, etc. With so many kinds of disasters happened one after another in the same place, this is a breakthrough that never seen before. After a 7 minutes ride through disasters, the visitor will have a profound and intuitive understanding towards disaster.

2、 The 360 panoramic shuttles of the volcano



Combined with the volcanic disaster and the 360° panoramic shuttle, this is an advanced project with experience. At the beginning, the visitors will enter the experience area and sitting at the seats that linked to each other and formed a loop of 360°. Then, the seats will be lifted up to the screen area, which is circular-screen of 360°. Follow the plot of the film, the seats will make the motions like clockwise and counterclockwise rotating, bouncing up and down; each seat will have effects like vibration, air blast, water. With the content of the film, all the effects will cause some visual illusion to the tourists; make them having the feelings of falling into the abyss or pumping into the sky. The ups and downs of the somatic effect combined with the film will give visitors an unparalleled experience of stimulation.

3、 Disaster Leap Cinema



This is a kind of experience equipment that combines the huge dome screen and the seats of motion to enjoy the extreme flight experience. When the visitors take their seats, the seat baffles will put down, and the seats will be launched, and suspended in front of the screen, and the visitors' feet will leave the ground like a flying bird. With the customized movie of disaster theme, the seats will moves from the left to the right and from the front to the back, so that the visitors have the feeling of an eagle flying in the clouds, and sometimes dives to the fire or fly over to the top of the mountain. It is an unprecedented way to experience disaster.

4、 360 degree immersive ball screen Theater



The 360 degree immersion ball theater is a 14 meter ball with 12 meters in diameter and an impressive 360 degree ball projection. The middle of the ball is a tempered glass corridor with a width of 2 meters wide and 12 meters long. It can hold 50 visitors at one time. Visitors can enter the ball screen from one side of the staircase, and the screen is filled with 18 high-definition laser projections. The movie lasts about 6 minutes, which enables tourists to truly experience the disaster scene, in order to deepen their understanding and experience of disaster scenes, and enhance their awareness of disaster prevention and reductions.

5、VR Earthquake House



We apply the virtual reality technology to the earthquake experience house to create the first VR earthquake experience house in China. The VR earthquake house realistically reproduces the "terrible scenes" of a real earthquake through VR technology, which is supplemented by earthquake simulation platform movements and simulates all kinds and all levels of earthquakes, allowing the people to experience the thrilling earthquake in the VR-created virtual space.

6、5D Multidimensional Time-travel



Dynamic 5D Ride break through the mode of traditional cinemas. It takes the car with visitors as a carrier; send them into two arc giant screens to encircling the vision of the car. With 3D movies of disaster theme and shaking platforms, the visitors will have an extremely shocking experience.

7、 VR Virtual Driving



The "VR Virtual Driving" project consists of a complete experience system, including VR glasses, steering wheel, shift lever and seats. The entire system can not only simulate extreme weather conditions such as rain and snow, but also simulate a variety of man-made traffic accidents. For example, in the simulation of the drunken driving accidents, there is a hydraulic rod behind the seat to simulate the shaking effect while drunk driving. Besides, there is an indicator in front of the seat, which can fully display the effects of people who experience in the VR video. VR, through real simulation, makes people personally on the scene, so as to more deeply understand the danger of traffic accidents.

8、 VR Virtual Display Electronic Mall



The arrival of VR and AR must be a great revolution for e-commerce and offline shopping. The same is true for emergency equipment selection and purchase. For example, to purchase a fire extinguisher or first aid kit, you do not need to extinguish the fire or rescue on site. Just wear our VR / AR equipment we developed, then you can experience and understand the use of the product in real time. From the pre-purchase category selection, to the purchase of the trial experience, and finally to the purchase of "recommended similar products ", VR / AR technology have used throughout all aspects of the shopping scene.

Classic Case

Jeonbuk 119 Safety Experience Museum

Central Zone Safety Experience Museum

Ulsan Museum of Safety Working Group Promotion

Busan Fire Safety Experience Museum
 Children's traffic safety experience museum
 Children's Comprehensive Support Center
 Ulsan Children's Education Promotion Institute
 Korea child safety experience base
 Samsung Dream Class in Korea
 Jeonbuk Security Education Courses



Hirain-Boya Emergency Science & Technology Co., Ltd, as cultural spread pioneer of emergency safety and intelligent disaster reduction, hopes to grow together with every colleague to meet the new era of AR|VR and promote the innovation and development of the world emergency industry with frontier science and technologies.

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EMERGENCY MANAGEMENT ARTICLES

Natural And Man Made Disasters: A Case Study In A Part Of Uttarkashi District, Garhwal Himalaya, Uttarakhand

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ABSTRACT

The Himalaya is very prone to the disastrous processes like Earthquake, Flash floods, landslides and debris flow etc. The area of investigation lies in the lesser and central Himalayan part of Garhwal Himalaya in Uttarkashi district of Uttarakhand from Hinna to Gangnani along Bhagirathi River. The occurrence of natural and man-made disasters are shown in the present study. The area is tectonically very active and triggered by major earthquakes several times. The intense rainfall during rainy season gives rise to situation of cloud bursts and great damages of life and property. The human influence in these sensitive areas has increased the intensity and frequency of these disasters in last 20 years. Early warning system and Disasters awakening program (From village level to central level) should be undertaken to minimize the impacts of these catastrophes.

INTRODUCTION

The Himalaya is the youngest mountain chain started forming around 55 Ma due to the collision of Indian Plate with the Tibetan plate. The Himalaya has gained the height due to the compressional folding hence the rocks remain under high tectonic pressure. The Himalaya also encompasses all kind of climatic regimes from subtropical to temperature and polar; and support large number of plants and animals species. The seasonal rainfall in India and neighboring countries is also due to heights of Himalaya. But this is also very prone to the disasters due to its fragile lithology and ecology.

The investigated area of present study lies in the lesser and central Himalayan region of district Uttarkashi, Garhwal Himalaya, Uttarakhand. Geographically, it is situated in latitude between 30° 40' to 30° 55' and longitude between 78° 30' to 78° 45'. The heavy death tolls in the 1991 earthquake and the regular cloudbursts in last few years especially the Kedarnath tragedy in 2013 has raised the interest in the occurrence of these hazards as well as their causes as natural factors and the human contribution.

GEOLOGICAL SET-UP OF THE AREA

Geologically, the study area lies in geo-tectonic block of lesser and central part of Garhwal Himalaya. Main Central Thrust (MCT) passes near Sainj, 20 km from Uttarkashi along Uttarkashi- Gangotri high way. MCT dips 50° to 60° N and follow NW-SE trend and is exposed along Kumalti gad and Dogadda gad. MCT separates the rocks of Garhwal group in south from the Central Crystallines in north. Some geologists are of opinion that this is Munsiri Thrust and thrust passes near Gangnani is the MCT while the others say that these are MCT-1 and MCT -2. Metcalf (1990) suggest that the zone between Sainj and Gangnani is NNE dipping shear zone possessing mylonitic fabric with strong elements of rotational shear. Litho-tectonic set up of the area is given in Table-1 (After Dave & Gupta 1982, Saklani (1986) Purohit & Thakur (1986) and Naithani (1992) and geological map in Figure 1 (A).

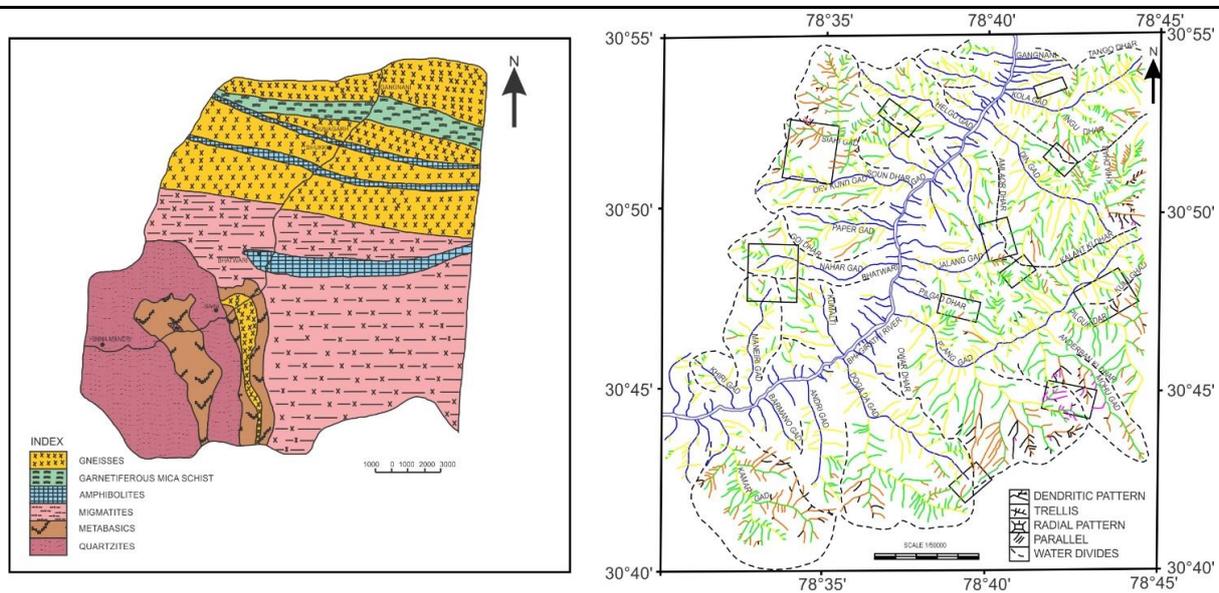


FIGURE 1. (A) GEOLOGICAL MAP OF THE AREA, (B) DRAINAGE MAP OF THE BHAGIRATHI BASIN BETWEEN MANERI AND GANGNANI

CLIMATIC CONDITIONS AND VEGETATION:

The climate is warm and humid. The area receives precipitation throughout the year, rainfall in the summers and some snowfall in winters. The average annual precipitation is around 1700 mm and average annual temperature is around 18°C. Uttarkashi has highly rich diversity of plants and around 70% of the area is covered with forests. From 1000-2000 m, pine is the common species. Between 2000 and 3000 m, deodar, oak and rhododendron are found. Beyond 3000 m spruce, birch and fir and bugyals are very common.

DISASTERS IN UTTARKASHI DISTRICT:

Due to the fragile lithology, tectonically active structures and intense rainfall in short time span, the disasters have become very common in Uttarkashi. Natural disasters are in the form of earthquakes, landslides, cloudbursts and flashfloods. The frequency of occurrence of these natural events have increased during last 20 years. Uttarkashi earthquake (1991) Chamoli earthquake (1999) Malpa and Ukhimath landslide of 1998, and Kedarnath tragedy of 2013 are natural disasters which causes the huge losses of property and life. Some catastrophes are also created by the human influence to this ecologically, geologically and climatologically very sensitive area. The unplanned and unscientific infrastructure in the form of dam, tunnel, buildings and roads; and the construction in river valley have increased the chances of local catastrophes as well as the magnitude of big natural disasters.

TABLE-1. LITHO-TECTONIC SET-UP OF THE AREA

	Garnetiferous Mica Schist
	Amphibolites
	Banded gneisses
	Augen gneisses
	Fine grained gneisses
Central Crystallines	Streaky gneisses and migmatites
	Foliated migmatites
	Augen migmatites
	Mylonitic migmatites
Quartz Muscovite schist	Biotite gneisses
	Quartz Chlorite schists
	Chlorite Schists
----- MAIN -----	CENTRAL ----- THRUST -----
	Schistose Quartzites
Garhwal Group	Epidiorites
	Mylonitic Quartzites
	Quartzites

NATURAL DISASTERS

EARTHQUAKES

The investigated area is geologically very sensitive. MCT is a main structural feature in Himalaya which extended about 2400 km all over the Himalaya and separates the rocks of lesser Himalaya from the Central Himalaya. As we know, the Indian plate is moving beneath the Tibetan plate towards NE direction at the rate of 5 cm per year. Due to the continuous movement, large amount of energy get stored in the rocks. Generally, this energy get released in the form of small earthquakes. But if the energy get locked and not released by the small earthquakes, the major earthquake occurred. The Uttarkashi earthquake of 20 October 1991, was very disastrous (intensity 6.2) and tremor the Northern part of Himalaya including Pakistan and Nepal. Its epicenter was at Agora near MCT with focus of 10 kms depth. About 2000 people were killed, 5067 injured, 1800 buildings destroyed, 1294 villages and 3,00,000 peoples were affected. Total loss of property was estimated about 93 crore Rupees. It damages all the houses along MCT but in Uttarkashi district mostly affected places were Jamak, Maneri, Dedsari, Lata, Saura, Siaba, Kamar, Gangnani and Bhatwari town. The Ganeshpur bridge was tilted and many cracks in the form of fissures were appears at the various places which reactivated number of landslides in the area. At Saura, Ganeshpur, Maneri, Jamak and Bhatwari the cracks were observed in NE-SW, NW-SE N-S and E-W direction. Earthquakes of minor intensity are very frequent in such geo-tectonic block (Table 2). Widening of cracks and percolation of water through these cracks in rainy season also support the reactivation of landslides in the area (Figure 2).



FIGURE 2. DAMAGE DUE TO EARTHQUAKE 1991 (A) COLLAPSE OF HOUSES AT UTTARKASHI, (B) CRACK IN THE HOUSE AT CHADETHI, (C) SLUMPING OF BHATWARI MARKET, (D) CRACKS IN BHATWARI ROAD

CLOUDBURSTS AND LANDSLIDES

The precipitation pattern is highly seasonal and most of the annual precipitation received in summer months by the Indian summer monsoon. The rainwater picks the sediments from the drier regions of the Central crystallines and the give rise to the debris flow of mud flow. **Cloudburst** disturbs the hill slope stability as and triggers the landslide in this Himalayan terrain. Malpa & Ukhimath landslide of 1998, Varunawat landslide 2003, Bhagirathi flashflood (2010) Asiganga flash flood of 2011, 2012 and Kedarnath incidence 2013 caused the huge loss of human life, animal's life, property and ecology. In last 20 years the events of cloudburst have increased which indicate the effects of global climate change in the area. Due to cloudbursts and flashfloods, the water suddenly rise in the streams and rivers which causes toe erosion. Due to toe erosion and cloud burst 69 shops and houses washed away by flashflood in the area. Major cloudbursts in Uttarkashi are shown in Table 3 and impacts shown in Figure 3. The major landslides are shown in Figure 4 and Table 4.

TABLE-2 EARTHQUAKES AND THEIR INTENSITY IN UTTARKASHI AREA

Date & Month	Intensity	Epicentre
20 October 1991	6.2	Agora
17 August 2005	4.1	Bhatwari
23 July 2007	5.1	Kharsali
18 March 2009	4.7	
21 September 2009	5.1	
20 June 2011	5.0	
28 August 2011	2.1	
21 September 2011	3.0	
20 November 2011	3.2	
10 February 2012	5.0	
27 November 2012	4.8	Rainthal
11 February 2013	4.3	
25 December 2013	4.0	



Figure 3. (A) VIEW OF UTTARKASHI AFTER FLASHFLOOD IN 2012, (B) DAMAGED BRIDGE OF TILOTH-UTTARKASHI MARKET AFTER FLASHFLOOD 2012.

Table-3 CLOUD BURST EVENTS IN BHATWARI AREA, DISTRICT UTTARKASHI

Locality	Year	Affected area
Saura gad	24 th July 2007	three bridges cultivated area washed away
Aungi	3 August 2010	Aungi, Bhatuksaura and Maneri
Hurri, Gangnani	12 th August 2010	Hurri, Gangnani, Bhatwari and Malla
Bhatwari	13 th August 2010	29 houses and 29 shops washed away
Aghora	August 2011	Asiganga valley
Nald and Rewara	5 th July 2012	Asiganga valley
Dayarabagh	3 rd August 2012	Dayarabagh area of Bhatwari
Siaba	16 th June 2013	Siaba cultivated area washed away

On 15 August, 2014; cloudburst events occurred at 7 places in lesser Himalayan part of Garhwal Himalaya

A cloud burst and flash flood occurred on 3rd August, 2012 at around 10 P.M. in Bhatwari tehsil of Uttarkashi District of Garhwal, Uttarakhand. The affected villages are situated on both the sides of Asiganga and Bhagirathi rivers. Heart-wrenching scenes were witnessed at Gangori where the maximum numbers of deaths were reported so far. There were about 700 pilgrims were stuck and efforts are made to move them to the safer place on foot, as the roads were totally damaged, and the hostile weather was not allowing airlifting of the people.



Figure 4. (A) LANDSLIDE BETWEEN MALLA AND BHATWARI, (B) ROCK CUM , (C) ROCKS AND DEBRIS LANDSLIDE NEAR SUNAGARH, (D) LANDSLIDE ON UPPER PART OF GANGNANI TEMPLE 2015

TABLE -4 MAJOR AND MINOR LANDSLIDES IN BHAGIRATHI VALLEY

Major Landslide in Bhagirathi valley

6 August 1978 Kanoldiya gad landslide
 9 September 1980 Dabrani Landslide
 30 August 2001 Sukki Landslide
 3 September 2003 Varunawat Landslide

Landslides in the investigated area

1. Heena slide (New slide) Debris slide
 2. Maneri dam slide (New slide) Debris slide
 3. Maneri Reservoir slide (new slide) Debris slide
 4. Aungi slide (Reactivated slide) Rock cum debris slide
 5. Lata slide (New slide) Debris slide
 6. Malla slide-1(Reactivated slide) Debris slide
 7. Bhatwari slide (Reactivated slide) Rock cum debris slide
 8. Chadethi slide (Reactivated slide) Rock cum debris slide
 9. Helgu slide (New slide) Debris slide
 10. Sunagarh slide-1 (New slide) Debris slide
 11. Sunagarh slide-2 (New slide) Debris slide
 12. Gangnani slide (New slide) Rock cum debris slide
-

MAN MADE DISASTERS

Man-made disasters are generally linked with the deforestation and infrastructure development in unscientific manner. The increased deforestation in last few decades have changed the land use and decreased the slope stability. The construction of buildings in river valley and loose material, tunnels and roads in the glacial morainic deposits and weak lithology, dams in areas of tectonically very active and excessive use of explosives during dam and tunnel construction have aggravated the conditions. Due to this irrational development, the occurrence of landslides and debris flow has increased many folds in last ten years. Few examples of manmade disaster are given below in the investigated area.

1. Kamar village is located over morainic material with moderate slope. Tunnel was constructed below Kamar village for 'Maneri to Uttarkashi road'. Earthquake of Uttarkashi 1991 destruct the village and maximum casualties of human happened in this village.
2. Varunawat landslide started in 1998 but no attention was paid to it and further the multi stories buildings constructed in the foot slopes of Varunawat. On 3 August 2003, the Varunawat landslide caused the loss of property and life in Uttarkashi.
3. In Bhatwari and Chadethi the Bhagirathi River flows in V shape valley. The lithology is amphibolites which are steeply dipping towards Bhagirathi River. Bhatwari market is located over debris and mylonitic migmatites. During 1991 earthquake the cracks were observed at various places. In 2010 and 2012 due to toe erosion of Bhagirathi river, 69 shops and residential houses slumps in Bhagirathi River.
4. Roads are constructed between Malla and Bhatwari on mylonitic migmatites. Due to toe erosion of Bhagirathi River, the road was damaged and land slide started in the upper part of road. This may block the Bhagirathi river and generate the disaster in future in the valley.
5. Asia's largest dam was constructed at Tehri in tectonically very active region, others are constructed near Maneri and Joshiyara at Bhagirathi river. Any large earthquake in the region may lead to great damage in the region.

SUGGESTIONS FOR MINIMIZING THE DISASTERS

1. The occurrence of disasters has increased many folds in last few decades. This may be attributed to the human influence and the climate change due to global warming.
2. The multistory hotels and building construction should be banned as the area comes under earthquake zone of IV and V. Houses, Hotels and other buildings should be earthquake resistant.
3. Due to cloud burst and heavy precipitation water increases in the stream and river channels which causes loss of life and property. So the construction should not be allowed in 200 mts from the channel.
4. From past history, we can mark the thrust areas of disaster in the district. The streams velocity and their water should be checked by proper monitoring. The river valley, weak lithology and tectonically very active regions should be avoided for government as well as private construction. The surveying agency (related to geological survey) should be answerable in case of disasters happened in safe declared areas.
5. Public should be encouraged to stop the deforestation and adopt agriculture with soil friendly techniques. A strong early warning system and better communication network should be developed in the villages. Afforestation should be done to stabilize the slopes.
6. To disaster rescue team should be made at village and block level. The education, training and disaster awareness program should be launched for the villages.
7. The Government should declare the 2015-2024 the **Decade of Disaster prevention in India** as suggested by Dr. R.K. Bhandari Ex-Director of CBRI.

DISCUSSIONS AND CONCLUSION

Most of the catastrophes in Uttarkashi district are of natural forcing as the earthquakes associated with the energy storage due to Indian plate movement towards Tibetan plate and the intense rainfall due to very high rainfall within the Indian monsoon season from June to September. But the human actions are also responsible for increasing the damages by damming the river valley with the unplanned projects, deforestation for making slopes unstable. This has raised the chances of new landslides and reactivation of previous landslides. The combined efforts of public and government, strict policies for development, afforestation are some of the preventive measures that can minimize the effects of these hazards.

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