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Global Alliance of
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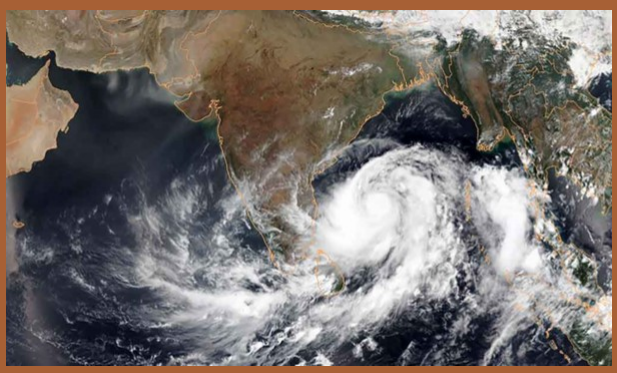

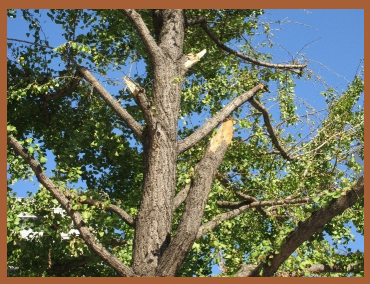

The summer is coming to an end and with mixed feelings we wait to welcome the Autumn. What is it – is it the joy and relief that the hot and humid summer is finally coming to an or the sadness for those of us who are blessed with the four seasons, to wait another full cycle of twelve months for the next summer – to enjoy bright early mornings, and long evenings – yet with the global warming, the summer temperatures are increasingly becoming unbearable and threatening our very livelihood.

In our journey to overcome this situation, we all need to work, even on a small scale, to prevent global warming and get other global stakeholders to work on it in a mega scale to overcome this situation. We, ourselves can start it in our own garages, our home, kitchen or by walking or taking public transport to work instead of using our car. Kyoto University Health Service introduced the "Walk to the Moon" challenge in 2017. Many of us participate in it and it is successfully carried out to date. Did you know "The moon is 384,000 km from earth which roughly equals 480,000,000 steps (Calculated assuming that one step is 0.8 m). If 2000 people walk 8000-10000 steps on an average daily for 4 weeks will cover the distance to the moon!". This is a healthy campus challenge. At the same time, it is a subtle nudge towards climate change by motivating people to get involved and get on the pedometer instead of the odometer.

This issue of GADRI Actions highlights some of the challenges faced by climate change, activities at GADRI member institutes and a report from the "Dealing with Disasters, GCRF, UK Alliance for Disaster Research, Disasters Research Group and UK Collaborative for Development Research".

We hope you enjoy this issue.

Hirokazu Tatano and Wilma James

Contents

Photos were taken by the staff of DPRI during the 4th Global Summit of Research Institutes for Disaster Risk Reduction held at DPRI, Kyoto University, Kyoto, Japan

GADRI Actions is designed, formatted and edited by Hirokazu Tatano and Wilma James.

Cyclone Fani

(3rd May 2019, Odisha, India)

By: Ms. Payal Nayak,
Assistant Professor, School of Climate and Disaster Studies (SCDS)
Centurion University of Technology and Management

Context

The current report briefly describes the immediate impact of very severe tropical cyclone, named 'Fani', that made landfall at 8.12 AM on 3rd May 2019 at Puri, Odisha, East Coast of India. The Category 4 cyclone had an estimated maximum sustained surface wind speed of 175-185 km/hr, gusting to 210 km/hr. Along the path it moved through the densely populated coastal Odisha, affecting 16.5 million in 14 districts, with severe destruction of life and property in the districts of Puri, Khurdha, Cuttack, Jagatsinghpr and Kendrapara.

Satellite image of Fani intensifying in the Bay of Bengal (National Oceanic and Atmospheric Administration, 1st May 2019). Source: Dhaka Tribune, Date:2nd May, 2019

Fani evolved from a depression in Indian Ocean, on the west of Sumatra on 26th April 2019. It maintained its intensity after crossing the sea, even after an interaction with land, and did not cause heavy rainfall. Its track remained closer to Odisha coast during its lifespan of 11 days, in the sea and land put together.

Pre-Cyclone Initiatives

Till 27th of May, 2019, the Indian Meteorological Department (IMD) did not predict any major impact on Odisha. However, The Joint Typhoon Warning Center (JTWC) suggested possible impact of the cyclone on the Odisha. IMD issued warnings on 30th of May, 2019 predicting that Fani would likely move northwestwards from its position and recurve towards Odisha coast. Skymet predicted intensification of Fani while it gained latitude.

More than 1.2 million people from 14 coastal and interior districts were evacuated to 900 cyclone shelters in 24 hours creating a record history. People were informed about the cyclone and coping strategy through regular announcements in electronic, print and social media. 2.6 million text messages were sent to warn about the cyclone. Fishermen were asked to refrain from the sea from 30th April night.

Police officer requesting a resident to evacuate

(Source: Outlook India, Date: 4th May, 2019)

Immediate Impact

In spite of such huge evacuation and communication, the state witnessed a loss of 64 precious human lives, 8 million livestock, 10 million trees, electricity, telecommunication and road infrastructure and other property.

Ripped off coconut farms in Puri District.

Source: New Indian Express, Date: 10th May, 2019.

Loss of Agriculture and agriculture based livelihood

The estimated damage to standing crops has been pegged at US$ 20 million, besides destruction of storage facilities and harvested crops. About 150,000 hectares of agricultural land has been affected by the cyclone. About 30,000 hectares of horticulture land with perennial crops such as mango, cashew, coconut and betel vine have been affected. These crops are relatively more valuable and were still standing in the field when the cyclone hit. Infrastructure used for floriculture, such as greenhouses, drip irrigation and sprinkler systems, have also taken a heavy hit.

Loss of non-farm livelihood

The cyclone has also destroyed the livelihood of craftsmen, who depended on natural products such as coir (for handicraft) and natural dyes (for painting) derived from trees. Tourism has got major blow. Over 600 hotels buzzing with tourists during summer days are mostly unoccupied. At the same time in previous year, 129 hotels in Puri had accounted for 84,000 summer tourists. The debris, damaged hotels and electricity infrastructure has brought down tourists to almost nil in the city. As far as fishermen are concerned their livelihood has gone due to loss of boats and fishing equipment.

Loss of infrastructure

The Odisha government has estimated Fani induced physical infrastructure loss at US$ 1700 million. It includes half a million houses, roads, culverts, electricity poles and wires, street lights, drains, community centers, town halls, parks, etc. 200,000 electric poles, 5030 km of 33 kV lines, 38613 km of 11 kV lines, 79485 km of low tension lines and 64304 distribution transformers are reportedly damaged. 2000 telecommunication towers have been damaged. (Hindu, 15th May, 2019).

Relief and Restoration Initiatives

44 teams of National Disaster Response Force, 20 teams of Odisha Disaster Rapid Action Force, 525 teams of Fire Services and 8 teams of Odisha Forest Development Corporation were deployed for search and rescue, tree cutting and road clearance in the affected areas.

Aftermath of Cyclone, Devastation of electrical infrastructure

Source: Outlook India, Date: 7th May, 2019.

200 gang men from Andhra Pradesh and 50 each from Telangana and West Bengal were engaged in the restoration of the electric poles. Heavy duty generators were engaged by Public Works Department to supply drinking water, since water storage and treatment facilities were majorly hit due to uprooting of trees.

Because of devastated telephone towers, HAM radio and satellite phones, were used to communicate with district headquarters. As relief measures for affected populations, rolls of polythene, food items, and survival kits were distributed by the state, market and civil society organisations.

Relief Distribution at Nimapada Block, Puri District
Source: Payal Nayak, CUTM, Date:17th of May, 2019.

Concluding Remarks

The state of Odisha, on the eastern seaboard of India, with 480 km of coastline, 11 major river systems and the geo-climatic conditions is vulnerable to different disasters such as floods, cyclones, droughts and heat waves. It has been witnessing a growing intensity of frequent disasters over the past 50 years.

The 'zero casualty' policy of the country has been driving the state's disaster management strategy and it has done a commendable job in issuing early warnings and evacuations of vulnerable people.

However, there is a need to strengthen its post-disaster restoration and rehabilitation strategies. It can be strengthened through building of strong community -based institutions and developing robust linkages with government departments. While the pre-disaster operations are mostly centralized due to the nature of its interventions requiring prompt actions, rehabilitation and restoration lacked considerable state and civil society partnership. It was reported that food relief was not received by some areas even after 48 hours and the communities and civil society agencies came forward to fill the gap. These groups have the potential to supplement the humungous task of relief and restoration during and post-disasters, because of their proximity, local knowledge and voluntary spirit.

Finally, there is a large need to develop context specific knowledge, and affordable disaster resilient technology and infrastructure to deal with the frequent occurring of cyclones in this economically backward coastal state in the long run, if it has to come out of the vicious cycle of disaster and economic underdevelopment.

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Extreme Winds in Urban Districts during Typhoon Jebi (2018)

By: Dr. Tetsuya Takemi, Associate Professor
Disaster Prevention Research Institute (DPRI), Kyoto University, Japan

Typhoon Jebi (2018) made landfall in the Osaka Bay area, Japan and caused significant damages to buildings and houses, trees, power lines, and so on. The maximum instantaneous wind measured at the meteorological observatory in Osaka reached 47.4 m s^{-1}, the third record in the history of the observatory.

This report documents the damages in an urban district of Osaka City, Japan and the results of the numerical analysis on extreme winds in the densely built, urban district.

1. Introduction

Typhoon Jebi (2018) developed in the western North Pacific in August 2018 and obtained the lifetime minimum central pressure of 915 hPa. After obtaining this intensity, Typhoon Jebi maintained its intensity while moving northward. On September 4th, Typhoon Jebi finally made landfall on the islands of Shikoku and Honshu, crossing over the Osaka Bay, and spawned storm surges/high waves around the bay areas as well as strong winds over the inland areas. Kansai International Airport (KIX) established on a reclaimed island in the Osaka Bay in 1994 was seriously damaged by storm surge. Furthermore, a large number of points observed extreme winds, which caused severe damages to houses/buildings, trees/forests, power lines, etc.

Typhoon Jebi took a track very similar to Typhoon Nancy (1961) and Muroto Typhoon (i.e., Daini-Muroto Typhoon) in 1934. In Osaka City, the 1st, 2nd, and 3rd highest record of instantaneous wind speed is 60.0 m s^{-1} in September 1934 (Muroto), 50.6 m s^{-1} in September 1961 (Daini-Muroto), and 47.4 m s^{-1} in September 2018 (Jebi), respectively. In Kyoto City, the maximum instantaneous wind speed during Typhoon Jebi was 39.4 m s^{-1}, which is the 2nd highest record since the observation started in 1915 (the 1st record in Kyoto City is 42.1 m s^{-1} in September 1934). This suggests that this typhoon has been the most threatening windstorm in the area. Considering the time period spanning from 1934 to 2018, the influences of both urbanization and global warming should be taken into account to assess the disaster risks by typhoons.

2. Damages by strong winds in the Namba area, Osaka City

In the Namba area, one of the business district in Osaka City, severe damages to houses, structures, trees along streets and in parks, occurred. Figure 1 shows damage to an old wooden house in the Namba area.

Figure 1: damage to an old house in Osaka City.

There were also damages to roofs, walls, signboards, etc. of buildings and houses. A large number of trees along the streets and in parks in Osaka City sustained severe damages.

Figure 2 shows the damages to trees along the Midousuji Street, a major street in Osaka City.

Figure 2: Damages to trees on the Midousuji street.

3. Numerical analysis of strong winds in Osaka City

After the severe damages incurred in urban districts, quantitative estimations of winds in the areas were necessary. However, it is very difficult to quantitatively estimate strong winds in urban districts, due to absence of observations within urban districts, and because of the inability to simulate airflows in urban districts with only a numerical weather prediction model. Explicit representations of urban buildings and structures are critically important to reproduce airflows within urban districts.

The idea in this study is to combine the advantages of a numerical weather prediction model and a turbulence model (large-eddy simulation model; LES) to quantitatively estimate the wind speeds in the business district of Osaka City. The weather prediction model can reproduce actual meteorological situations including Typhoon Jebi (2018), while the LES model can incorporate the actual buildings and structures and hence reproduce turbulent airflows within actual urban districts. The framework of this analysis is presented in Figure 3.

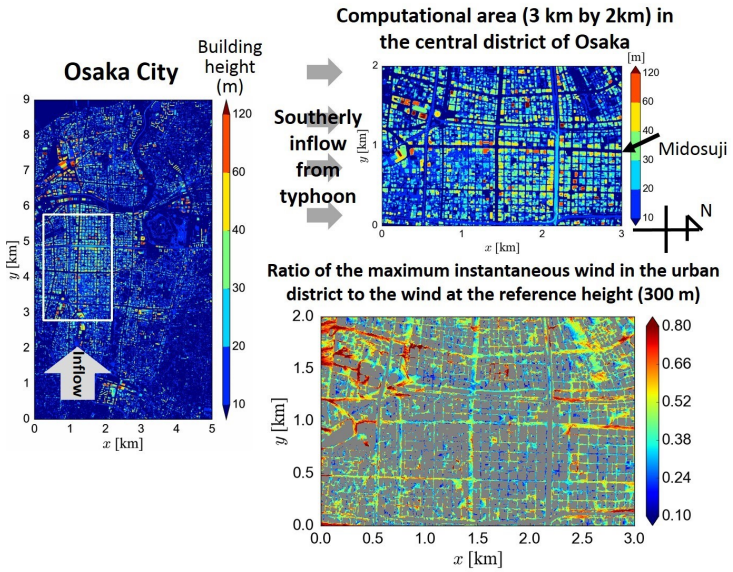

Figure 3: Conceptual framework of the numerical analysis of strong winds in urban districts.

The LES model was able to simulate fluctuating, turbulent airflows within the business district of Osaka City. By referring to the simulated wind speeds by the weather model and quantifying the wind speeds simulated by the LES model, the maximum wind speeds in some areas within the district analyzed here were estimated to be 60 - 70 m s^{-1}, owing to the downward transport of strong winds at higher levels above the urban canopy (Figure 4).

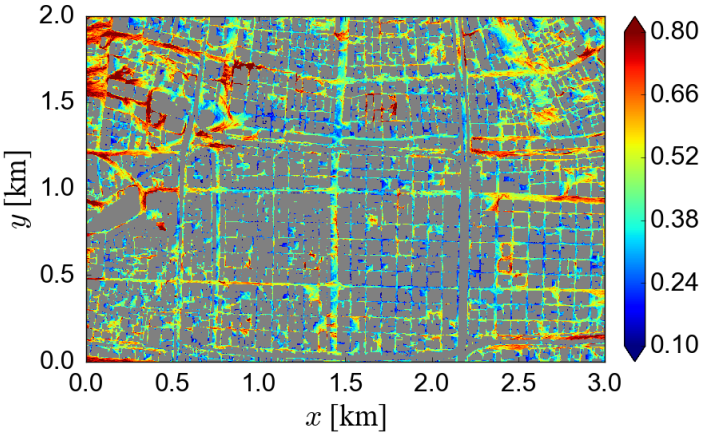

Figure 4: The spatial distribution of the maximum instantaneous wind speed at the 10-m height from the time series of the wind speed at each grid point in a business district of Osaka City.

4. Implications

The turbulent airflows and the maximum wind gusts within the actual business district of Osaka City were successfully estimated by combining the meteorological simulations and building-resolving turbulent airflow simulations. Wind speeds were highly variable, depending on the arrangement and vertical extent of surrounding buildings and structures. From this study, emphasize is placed on the critical importance to understand the risk of strong winds hidden in urban districts by conducting similar analyses on various metropolitan areas. Considering the ongoing re-shaping of metropolitan areas and the increasing number of high-rise buildings in Japan and the possible impacts of future climate change on the intensification of typhoons, it is necessary to understand emerging risks of strong winds in urban districts.

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global platform for disaster risk reduction
Geneva, Switzerland, 13-17 May 2019

Science and Policy Forum
Geneva, Switzerland
13-14 May 2019

Photo by UNDRR

GADRI Presence at the Science and Policy Forum, Global Platform for Disaster Risk Reduction 2019

The main focus of the GADRI 4th Global Summit of Research Institutes for Disaster Risk Reduction was the contributions to the contextualization of the Science and Technology Roadmap which was presented during the Science and Policy Forum on 13 to 14 May 2019 at the Global Platform 2019 in Geneva, Switzerland.

Prof. Hirokazu Tatano, Secretary-General of GADRI was invited to discuss in the session on “Presentation of the contextualized Global Science and Technology Roadmap, for adoption by the participants” at the Science and Policy Forum.“ The Science and Policy Forum focused on advancing interdisciplinary collaboration and better linkages between the science community and policy-makers to build effective and coherent approaches to risk reduction and resilience building thereby supporting the transformative change required to achieve the ambitious 2030 Agenda in an increasingly interconnected and cascading risk landscape to ensure nobody is left behind.”

Photo by UNDRR

The Science and Technology Roadmap is intended as a living document to be implemented by the science and technology community in partnership with other stakeholders. During the GADRI 4th Global Summit, participants contributed collectively for the improvement and contextualization of the Science and Technology Roadmap.

Further details can be found at the website - https://www.unisdr.org/conference/2019/globalplatform/programme/preparatory-days/view?id=965

Revised Science and Technology Road Map - https://www.preventionweb.net/files/c49ab99020190411_Science_Technology_Road_Map_Final_(1).pdf

Dealing with Disasters, GCRF, UK Alliance for Disaster Research, Disasters Research Group and UK Collaborative for Development Research

DwD-GCRF-UKADR-DRG-UKCDR International Conference, 2019

17th, 18th and 19th July @ Northumbria University, Newcastle upon Tyne, UK

New points of departure in transitioning disaster reduction and sustainability challenges

POST EVENT – INITIAL REPORT

By: Prof. Andrew Collins, Northumbria University and Co-Chair of UKADR

This year's conference aimed to stimulate debate and advance thinking around 'New Points of Departure in Transitioning Disaster Reduction and Sustainability Challenges', to build on the progress made in the recent United Nations Global Platform 2019 and in anticipation of the forthcoming Climate Summit**.** There is a need for new points of departure in relation to science and technology, political will and behaviour in bringing systemic changes to the way people take on disaster threats and sustainability challenges, to survive and for future quality of life**.**

Supported by the UKs Global Challenges Research Fund (GCRF) the occasion combined the 12th Dealing with Disasters (DwD) and 3rd UK Alliance of Disaster Research (UKADR) Conferences, Disaster Research Group (DRG) and UK Collaborative for Development Research (UKCDR) in examining current advances and future research needs. The event took place on the 10th Anniversary of the Disasters Research Group (DRG). Further details on each of these institutions and the Northumbria University Disaster and Development Network (DDN) is available in the main conference brochure posted to the web site www.northumbria.ac.uk/dwd2019 .

The conference was attended by 130 delegates from 17 countries. Structured into six plenary and 18 parallel sessions it included 100 presentations, five workshops, a symposium the Annual General Meeting of the United Kingdom Alliance for Disaster Research (UKADR). Whilst this was not the largest of the multi-disciplinary Dealing with Disasters events hosted by Northumbria to date it facilitated highly significant content and policy reach and has received positive feedback.

Following an opening by the Northumbria Pro Vice-Chancellor, Lucy Winskell, and introductions from the partner institutions the envoy of the Special Representative of the United Nations Secretary General, Ricardo Mena, provided an overview of the current state of knowledge application towards global targets of disaster risk reduction alongside the sustainable development agenda.

The UK Government's Department for International Development representative and Senior Humanitarian Advisor, Roger Bellers, presented the new emphasis for his department on fragility and conflict affected regions. This was followed by the first of a series of UK Research and Innovation (UKRI) inputs. Ruth Kelman for NERC presented on investment into resilient environments. Later plenaries included inputs from ESRC on inequitable resilience and from the GCRF, UK Space Agency and the European Commission.

Plenaries on the second day of the conference begun with a special address from the Disaster Risk Management Focal Point of the World Health Organisation, Jonathan Abrahams. He was joined by the representative of the WHO Kobe Centre from Japan Ryoma Kayano, Head of Global Disaster Risk Reduction for Public Health England, Virginia Murray, Ben Taylor, Chief Executive of Evidence Aid and a special delegation from the Chinese University of Hong Kong.

Parallel sessions and plenaries included inputs from 17 UK University physical, environmental and social sciences groups and six Non-Governmental Organisations.

Two workshops lead by Public Health England on 'Hazards redefinition' and by Northumbria on 'Action Data' took place as part of Working Groups of the United Nations, and also being supported by GCRF. A workshop hosted by Alliance to Feed the Earth in Disasters (ALLFED) provided a team of its staff from varied backgrounds in interactive exploration of scenarios. A workshop provided by University of Salford THINKlab demonstrated state of the art satellite and modelling technologies for enhancing disaster risk reduction and response.

Following the second day opening plenary, the WHO Thematic Platform for Health Emergency and Disaster Risk Management Research Network symposium consisted of two further sessions with 12 inputs, including four from DDN affiliates and one from Northumbria Healthcare Trust. The Platform was launched as part of the inclusion of health (and well-being) in the Sendai Framework for Disaster Risk Reduction 2015-2030 and follows last years research Summit of the same Platform at the Chinese University of Hong Kong exactly one year earlier. A contribution to this process had also been made via the 2015 Dealing with Disasters conference on Health Centred Disaster Risk Reduction.

Two of the recently established large GCRF Research Hubs, on Urban Risk Transitions (Tomorrow's Cities) and Living Deltas provided a first combined GCRF hubs session. This included debate around core themes of the hubs and the challenges and opportunities offered by this new form of UK research investment and with inputs from nine institutions.

A special workshop session of the 'Youth Voice' in Disaster Risk Reduction was organised by Mark Ashley Parry of the Northumbria University Disaster and Development Society (DDS). This included inputs from schools, the South African Youth Centre for DRR, the Corpo Italiano di San Lazzaro, Italy, Kyoto University, Japan and by remote link up from Northumbria Post-graduate students currently carrying out field work in one of the more isolated regions of Nepal. This special session was also stimulated by current actions surrounding the school climate action and Extinction Rebellion.

A fuller report on the proceedings and outcome of the conference is being worked on for later release. It is intended that all presentations will be made available online for those who consent to that.

The hosts at Northumbria University are thankful to the partner organisations, the United Kingdom Alliance for Disaster Research (UKADR), the Global Challenges Research Fund (GCRF), the Disasters Research Group (DRG) and the United Kingdom Collaborative for Development Research (UKADR) for this combined conference. Institutional supporting organisations were the United Nations Office for Disaster Risk Reduction (UNDRR), Public Health England (PHE), Integrated Research on Disaster Risk (IRDR), University of Bristol Cabot Institute, Collaborating Centre for Oxford University and Chinese University of Hong (CCOUC), WHO Thematic Platform for Health Emergency and Disaster Risk Management and the Global Alliance of Disaster Research Institutes (GADRI). The event was supported by a Committee of nine people from within this group who are named in the main conference documentation. The event benefitted from the support of Northumbria Research and Innovation Services and Northumbria Campus Services.

The Conference Chair would also like to specifically thank staff and students of the Department of Geography and Environmental Sciences and the wider Northumbria University who in various ways contributed inputs. Thanks to Mark Ashley Parry and to Becky Richardson for their important enthusiasm and back up across several academic and logistical aspects of delivery.

2019 International Training workshop for Natural Disaster Reduction

National Science and Technology Center for Disaster Reduction (NCDR), Chinese Taipei
By: Mr. Hasitha Adikari, Research Engineer, Center for Urban Waters (CUrW), Sri Lanka

The 3-day International Training Workshop for Natural Disaster Reduction was organized by NCDR from 25th to 27th June 2019.

New research ideas presented

1. Utilize Social Media and Big Data to Build a Real-time Disaster Management System - by Dr. Ming-Hsiang (Ming) Tsou (Director of the Center for Human Dynamics in the Mobile Age, Professor Department of Geography, San Diego State University)

Use geotagged tweets for understanding/simulating how general public behave (people in the same network community are more likely to make the same decision), what type of actions they'll take and what routes they'll take before/after the evacuation. Also use these tweets to identify the real time conditions like traffic jams and need of food and water in an emergency situation.

Building dynamic population model to build population density maps based on different types of land use data and census data. These maps will provide actual status of the population behaviour so they'll improve disaster responsiveness and evacuation procedures.

2. The challenge of utilizing social media for evacuation and sheltering support - by USDA, Yuichiro. Ph.D. (Director General, Center for Comprehensive Management of Disaster Information, NIED, Japan)

In a disaster situation various government and non-government organizations needs to work collectively and effectively to minimize the effects of the disaster. But different organizations may have different needs of information formats and types. So there's a requirement for information pipeline which can extract data from various sources and integrate extracted information into the form of use for users.

SIP4D (Shared Information Platform for Disaster Management) is an information sharing platform that collects disaster related data from various sources and distribute them as "ready to use" information to disaster response organizations. Changes of the disaster and its condition needs to deploy accurate post disaster activities. But grasping this change with the available regular information is challengeable task since changes were not visible to the regular information. So there is a need of a system that observes "the disaster dynamics" by observing dynamics of society.

CPS4D (Cyber Physical System for Disaster Resilience) - Resilient network that keeps connecting real and cyberspace which maps dynamics of the disaster in real space and can have the ability to drive behavior and activity in real space by the information in cyberspace. To do the mapping between real space and cyberspace this platform uses Disaster response chatbot which included Natural language processing platform (DISAANA/D-SUMM). This chatbot provides functionalities such as autonomous information gathering and providing evacuation supporting information for each citizen.

3, Strategy and methodology for Data Analysis from Social Media - Geographic Information extraction - by Chiao-Ling kuo (Assistant Research Fellow - Center for GIS, Research Center for Humanities and Social Sciences (RCHSS), Academia Sinica). Identifying and predicting trends using geotagged photos will be useful in decision making in disaster management.

4. Information Extraction for Event or Activity Monitoring on Social Media - by Prof. Chia-Hui Chang (WIDM LAB, National Central University, Taiwan)

POI is a specific point location that someone may find useful or interesting. Extracting POI data from various social media sources and construct a POI-DB, and verify POI relations to enable POI search on maps will be useful in disaster risk reduction activities.

Users can report damage occurred in various textual formats. So need to extract location, damage, date time occurred and other relevant information from those reports. After geocoding the locations we can easily visualize them in maps to provide more information about the disaster to the relevant parties.

5. An empirical study of social listening in disaster reduction and emergency management - by Willie Yang, Ph.D. (Assistant Professor, Dept. of Business Administration, National Taiwan University. Managing Director, OpView Team/eLand Technologies Corporation)

There is a requirement of a system which can collect information from Social forums, blogs and many other web contents. Also for a platform which can process those gathered data, basically topic identification and tracking, volume analysis, automatic keyword extraction and summarization, sentiment analysis and influencer analysis. OpView provides all these functionalities under single platform. So with the help of OpView's natural language processing and intelligent agent technology, the content and the context related to a disaster or emergency (earthquake, typhoon, etc.) may be detected and extracted very fast, in all stages (Pre-event, Event, Post-event).

Experience from field visits

1. Chunghwa Telecom.

The largest telco service of the Taiwan which manages IoT data for NCDR.

IoT smart platform - Managing DMP devices connections provide fast device management function, instant device status notification , and interacts smartly with other devices and 3rd-party application services. Also this platform provides data security monitor, protection, and detection to ensure overall data protection and security of different layers from the platform to sensory devices. Smart Cloud - Develop spark based solution for big data analysis providing a rich selection of data analytic macros for users to choose and use on big data at different stages (data preparation -> model prediction) to help with data analysis.

Smart Energy Applications - Includes five categories, namely measurement services, expert power consumption diagnosis, solar energy management, water resources management, and industrial energy conservation services.

Other than above mentioned projects there are few interesting IoT projects like smart city, smart agriculture, smart building and etc.. Also the Disaster information system which included flood monitoring and landslide monitoring has significant impact on disaster risk reduction.

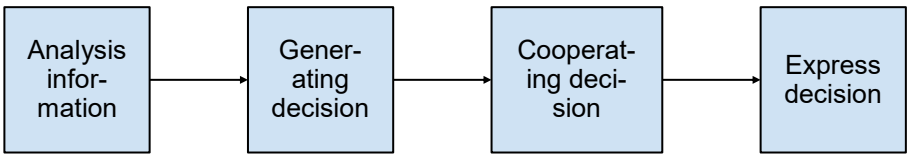
2. NCDR (National Science and Technology Center for Disaster Reduction, Taiwan)

Daily operational activities - Conduct mission oriented research activities related to issues of natural disaster. Collaboration with domestic and international institutes and facilitate consultations.

During emergency situation - Join the operations in the Central Emergency Operation Center by offering integrated information and sharing timely suggestions. Deliver common operational pictures to the government through the decision support system.

Post-disaster actions - Conduct on-site investigations. Annually update the hazard maps for public awareness with the cooperation with the government sector. Monitor outcomes of long-term post-disaster recovery by the field surveys.

CEOC (Central Emergency Operation Center) - Consists of four divisions Chief staff division, News and Media's division, Operation division and Administrative division. Operation tasks of CEOC includes analysis disaster situation, conduct situation assessment meetings (at least 3 times per day), prepare work report meeting (at least 3 times per day) and conduct after work report meeting to express the disaster preparedness and decisions. So decision workflow of CEOC is as follows,



CEOC situation assessment group (for Typhoon situation) :

- NCDR - Risk assessment, Technology support.
- Water Resource agency - Hydro information of river. Dam and pumping station operation.
- National Fire Agency - Loss estimation. Coordination and communication.
- Directorate General of Highways - consultation.
- The Soil and Water Conservation Bureau - Potential streams of debris flow. Monitoring and warning.
- Central Weather Bureau - Dynamic data of typhoon.
- Office of Disaster Management

Learning outcomes

1. Need of educating and empowering people. Reach out to the people.

Conducting training sessions and workshops to schools, universities and local public has significant effect on disaster risk reduction process. General public should have the knowledge regarding following disaster prevention and mitigation activities also how to behave in a disaster situation.

General scenario public has much less interest and knowledge about these situations till they face them. To prevent the risk of a disaster support from general public has tremendous effect so reaching out to them and educating them has very much importance in disaster risk reduction.

2. Necessity of timely decision making and importance of data.

- Historical data (Threshold values)
- Observed data (Current situation)
- Numerical models (Forecast and nowcast)
- Take Action (Decision maker, Local residents)

Time will be one of the most crucial factors in disaster situation so understanding the evolution of data and their sources have significant advantages to face disaster situation. So we should try every possible method to reach out to the general public to spread the disaster warnings timely. For this standard communications methods may be less effective with time constraint so we should use novel techniques like social media to spread the warning effectively and timely.

3. Requirement of all relevant disaster information on one integrated platform for decision making.

Decision making on disaster condition may involve various information sources from various sources. If decision makers have one platform to visualize all the information it will be more convenient and efficient in decision making.

4. Evolution of Emergency management with the collective involvement among stakeholders. Main factors of emergency management has evolved as follows:

Factors/Stage	Experience	Science	Information
Tools	Paper maps, radio	Digital risk maps, scenarios	Social media, real time data
Actions	evacuations	Early warning, evacuations	Risk communication, impact based preparedness
Info sources	faxes, news	Data, internet	Live videos, social media

Fun Activities

National Chiang Kai-shek Memorial Hall

Hakka cultural park

Taipei 101

2019 International Training Workshop for Natural Disaster Reduction- Applying Social media in Disaster Reduction

By: Ms. Kiri chen, Research Assistant, NCDR

Two-way communications through social media become an efficient and effective channel to collect inputs and disseminate information. Compared with traditional sensor-based data, social media provides non-structural, real-time and direct responses to disaster managers. Enhancing digital preparedness by social media for disaster risk reduction and emergency response is a new trend of evidence-based disaster management which offers the continuous and local information to test preparation and reaction conducted by the public sector.

The Workshop took place from 25 to 27 June in New Taipei City, and focuses on all innovative applications of social media in helping disaster risk management and emergency preparedness. Through sharing of case studies from individual social media and discussing, all delegates also joined brainstorming in what and how to define effective two-way risk communications through social media as well as joining field visit to the Chunghwa Telecom Company, to see applications of 5G telecommunication, Internet of Things (IoT) and dynamic big data produced by private sector.

There are 38 delegates (5 were recommended by GADRI) from 14 countries attended the workshop, including Bhutan, India, Indonesia, Cambodia, Japan, Myanmar, Malaysia, Nepal, the Philippines, Pakistan, Sri Lanka, Solomon Islands, Thailand, The United States, Viet Nam and Zimbabwe.

Field visit to Chunghwa Telecom

Seminar on High-quality Earthquake Locations, DPRI, Kyoto University 12 June 2019

A seminar on High-quality Earthquake Locations was organized by Prof. Jim Mori, Head, Research Division of Earthquake Hazards, DPRI, Kyoto University, Uji Campus on 12th June 2019. Various presentations were delivered by the following participants:

1. High-quality earthquake locations using regional waves in mainland East Asia by Paul Richards (LDEO, Columbia University, USA)
2. Hypocenter catalog redetermined with three-dimensional seismic velocity structure by Makoto Matsubara (NIED, Tsukuba, Japan)

3. Japan Unified hI-resolution relocated Catalog for Earthquakes (JUICE) using double-difference earthquake relocation method, Tomoko Elizabeth Yano (NIED, Tsukuba, Japan)
4. An automatic hypocenter determination system of the JMA unified earthquake catalog, Koji Tamaribuchi (JMA, Japan)
5. Precise location of very small□ (down to Mw -5) mining-induced□acoustic emissions, Makoto Naoi (DPRI, Kyoto University, Japan)

Lecture on Damage to the water network of Uki City from the 2016 Kumamoto earthquake: Derivation of damage functions and construction of loss scenarios delivered by Dr. Pierre Gehl, BRGM

Lecture on “Damage to the water network of Uki City from the 2016 Kumamoto earthquake: Derivation of damage functions and construction of loss scenarios” was delivered by Dr. Pierre Gehl, BRGM (French Geological Survey) on 11th June 2019 at DPRI, Kyoto University. Dr. Gehl was visiting DPRI at the invitation of Prof. Shinichi Matsushima, Research Division of Earthquake Disasters, DPRI, Kyoto University.

Abstract of the lecture: Empirical data from water pipeline damage due to the 2016 Kumamoto earthquake are used to calibrate and update existing damage functions (i.e., pipeline repair rate). Using a Bayesian updating framework, it is shown that the parameters of the damage function are highly dependent on the shake-map(s) used to represent the earthquake event, as well as the site amplification model considered. The effect of specific land conditions (e.g., topographic / geological factors) is also investigated. Finally, the developed damage functions may be applied to stochastic simulations of the seismic performance of the water network, while keeping track of various sources of uncertainties.

Establishment of The North American Alliance of Hazards and Disaster Research Institutes (NAAHDRI)

Last summer, a group of directors of university-based hazards and disaster laboratories, centers, and institutes voted to adopt a charter for forming the North American Alliance of Hazards and Disaster Research Institutes (NAAHDRI). On Sunday, July 14, 2019, NAAHDRI held its first official meeting to discuss future priorities for research, education, and policy advocacy.

The meeting was chaired by the newly elected Board of Directors, and over 40 center and institute directors attended. In addition, Prof. Tatano from the Global Alliance of Disaster Research Institutes (GADRI) was present at the meeting. During the meeting, the members of the recently elected Board of Directors were introduced, and new members and contributors were acknowledged and welcomed. The meeting proceeded with a discussion of priorities for year 1, a brainstorming session of longer-term visions for the Alliance, and the establishment of a process for engagement with and communication among NAAHDRI members.

Visit by Federal University of Campina Grande (UFCG), Brazil

Prof. Carlos de Oliveira Galvão from the Federal University of Campina Grande, Brazil visited DPRI, Kyoto University and GADRI Secretariat on 30 May 2019 during his two-week visit to Kobe University. One agenda item in particular related to increasing GADRI visibility in Brazil and active contributions to support GADRI activities. Prof. Galvão is also an alumni of DPRI, Kyoto University.

New GADRI Members

Environment and Natural Resources Research Program (PIRNA), Instituto de Geografía “Romualdo Ardissone”, Facultad de Filosofía y Letras, Universidad de Buenos Aires, Argentina

The Program of Investigations in Natural Resources and Environment (PIRNA) works since 1988 in the Institute of Geography of the Faculty of Philosophy and Letters of the University of Buenos Aires. Its objective is to generate knowledge and train researchers in the problem of the use and management of natural resources and the environment, with an emphasis on aspects related to territorial configurations.

http://geografia.institutos.filo.uba.ar/

School of Earth and Environmental Sciences (SMAH), University of Wollongong, Australia

The GeoQuEST Research Centre represents an interdisciplinary team from the Faculty of Science, Medicine and Health and the Faculty of Engineering and Information Sciences that have a focus on environmental and climate change research under the overall theme of Earth System Science and Technology. The centre brings together outstanding researchers studying the atmosphere, earth and water within the broad disciplines of geography, geology, environmental science and environmental engineering who share interests in environmental processes and climate change. https://www.uow.edu.au/science-medicine-health/research/geoquest/

Global Earthquake Model (GEM) Foundation, Italy

The GEM Foundation is a non-profit, public-private partnership that drives a global collaborative effort to develop scientific and high-quality resources for transparent assessment of earthquake risk and to facilitate their application for risk management around the globe. Assisted by an initiative of the OECD's Global Science Forum, GEM was formed in 2009 as a non-profit foundation in Pavia, Italy, funded through a public-private sponsorship with the vision to create a world that is resilient to earthquakes. GEM’s mission is to become one of the world’s most complete sources of risk resources and a globally accepted standard for seismic risk assessment; and to ensure that its products are applied in earthquake risk management worldwide.

https://www.globalquakemodel.org/

Risk and Crisis Research Centre (RCRC), Mid Sweden University, Sweden

Risk and Crisis Research Centre (RCR) develops and communicates knowledge about risk, crisis and security. RCR gathers researchers from nine different disciplines. The centre’s activities include research, education and collaboration. Through RCR, you have a unique opportunity to access research results on how risk is perceived and assessed and how crises are managed, all for the benefit of society.

https://www.miun.se/en/RCR/

Center for Risk and Economic Analysis of Terrorism Events (CREATE), University of South Carolina, USA

The mission of the Center for Risk and Economic Analysis of Terrorism Events (CREATE) is to improve our Nation's security through the development of advanced models and tools for the evaluation of the risks, costs and consequences of terrorism and to guide economically viable investments in homeland security.

https://create.usc.edu/

GADRI Members

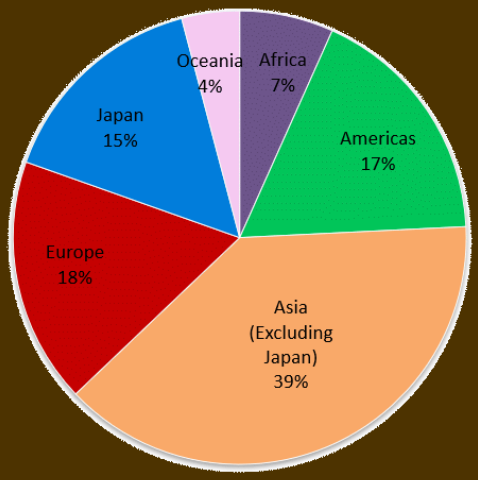
The Global Alliance of Disaster Research Institutes (GADRI) was established in March 2015 to support the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR) and the work of the Scientific and Technical Advisory Group of the United Nations Office for Disaster Risk Reduction (UNDRR).

GADRI join hands with research institutes around the world to further realize these goals and targets of the Science and Technology Roadmap. Since March 2015, GADRI's membership has expanded to nearly 200 member institutions (as of 31 August 2019).

GADRI Secretariat is currently hosted by the Disaster Prevention Research Institute (DPRI), Kyoto University, Uji Campus, Kyoto, Japan.

Membership is free; and completely voluntary and non-binding.

To join GADRI, please contact GADRI Secretariat:



Area	Members	States
Africa	13	7
Americas	34	8
Asia (Excluding Japan)	75	19
Europe	34	11
Japan	30	1
Oceania	8	2
Total Institutes	**194**	**48**
	48 states	

GADRI
Global Alliance of
Disaster Research Institutes

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