International Thematic Group for
Wind-related Disaster Risk Reduction

IG-WRDRR

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Activities of International Group for Wind-Related Disaster Risk Reduction (IG-WRDRR) from 2009 to 2013

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1 PRESSING NEEDS OF CONCERTED COOPERATIVE ACTIONS OF ACADEMIC ASSOCIATIONS, INTERNATIONAL ORGANIZATIONS, AND LOCAL COMMUNITIES

Devastating tropical cyclones are generally accompanied by high waves, storm surge, heavy rains, floods, landslides, lightning and so on. Thus, there is a pressing need for pooling of expertise and cooperative actions to reduce losses from various types of these “wind-related” natural hazards. Interactions among various groups with diverse backgrounds, but with a common focus on disaster reduction, to highlight the issues surrounding wind-related hazards and their impact on constructed facilities and society at large should be facilitated. It should also be noted that other hazards such as ocean waves, storm surge, heavy rains, flooding, landslides, lightning, fires and heat waves are directly or indirectly associated with winds around the globe and should be treated in a holistic manner rather than each in isolation.

Despite this recognition of the critical need for cooperative actions in wind-related disaster risk reduction (WRDRR) activities among various academic associations, there have been no notable collaborative efforts in the past. ISWE3 was entitled “Cooperative Actions for Disaster Risk Reduction (CADRR, 2009)” and was held at the United Nations University under the auspices of the UN International Strategy for Disaster Reduction (UN/ISDR) Secretariat.

Damage to buildings and structures is caused not only by strong wind pressure and debris impacts but also by water-induced forces and others. It is not easy to distinguish between damage due to wind and that due to water in some cases. It is also necessary to find an appropriate scale or yardstick to evaluate the damage level caused by the combined effects of wind and water.

As reported in CADRR (2009), immediate collaboration among area-specific academic associations and international organizations working on disaster risk reduction (DRR) at the societal level is also necessary. Closer communications and inputs from academic associations to international organizations working on DRR and reconstruction areas are essential to ensure their effectiveness. Post-disaster activities must be well coordinated to reflect ground realities, e.g., the need for medicines, clothing and food must be critically evaluated by a central organization and conveyed to donors to avoid arrival of unnecessary aid at the site only to stifle the moribund infrastructure in the wake of a disaster. The discussions at CADRR (2009) emphasized the need for such a critical arm of the disaster risk reduction group to take charge in steering post-disaster investigations, distribution of essential goods, recovery and other related efforts.
2 LAUNCH OF INTERNATIONAL THEMATIC GROUP FOR WRDRR

The International Thematic Group for Wind-Related Disaster Risk Reduction (IG-WRDRR) was formally launched under the auspices of the UN/ISDR Secretariat at the Second Session of the Global Platform (GP2) for DRR held in Geneva, Switzerland, from June 16-19, 2009. This Group is responsible for establishing linkages and coordinating various communities to serve as inter-agency coordinators with a charter to work with international organizations involving agencies of the UN and involved NGOs, and to embolden their activities that help to serve as a bridge between policy makers and agencies responsible for actually carrying out the DRR at the local community level. Figure 1 records the launch of IG-WRDRR in Geneva, Switzerland on June 2009.

3 ORGANIZATION OF IG-WRDRR

IG-WRDRR is a thematic group under the umbrella of UN/ISDR. Current member organizations of IG-WRDRR include Tokyo Polytechnic University (TPU), International Association for Wind Engineering (IAWE), World Meteorological Organization (WMO), International Federation of Red Cross and Red Crescent Societies (IFRC), International Centre for Water Hazard and Risk Management (ICARM), UN Economic and Social Commission for Asia and the Pacific (UNESCAP), UN-Habitat, United Nations University (UNU), Asia Disaster Reduction Center (ADRD), Bangladesh Disaster Preparedness Centre (BDPC), Socio Economic Education Development Service (SEEDS) Asia, Asian Disaster Reduction and Response Network (ADRRN) and others. Following the launch of IG-WRDRR, IAWE established a Working Group inside IAWE to work on WRDRR. The latest reports made by IG-WRDRR are available from its website at http://www.iawe.org/WRDRR/index.html.

4 TORNADO DISASTER RISK REDUCTION ACTIVITIES IN BANGLADESH

4.1 International Forum on Tornado Disaster Risk Reduction for Bangladesh and Workshop on Tornado Shelter for Bangladesh

“The International Forum on Tornado Disaster Risk Reduction for Bangladesh - To Cope With Neglected Severe Disasters” in Dhaka, Bangladesh, on 13-14 December, 2009 was co-organized
with TPU, the Government of Bangladesh (Disaster Management Bureau, Ministry of Food and Disaster Management, Meteorological Department, Ministry of Defense), BDPC and IAWE, as shown in Fig.2. This forum was the first official event of IG-WRDRR. As one of the outcomes of this forum, recommendations were made to help the Government of Bangladesh to adopt policies and carry out development planning to reduce risks from severe local storms (SLS) and to stimulate donor agencies and NGOs to implement specific projects to reduce SLS disaster risks. The report of the Forum, including a position paper, recommendations and so on, was published and distributed to the Bangladesh government, supporting countries, and supporting organizations in April 2011, as shown in Fig.3.

As a follow-up to the International Forum, IG-WRDRR held a mini-workshop on Tornado Shelter for Bangladesh on January 25-26, 2011 in Dhaka with the cooperation of BDPC and SEEDS Asia. Due to the complex mixture of storms experienced in Bangladesh and the structurally weak housing found in rural villages, the devastation a storm causes demands that more attention be paid to rescuing and caring for victims than to documenting exactly what happened meteorologi-
cally. Hence, there has arisen a need to understand the meteorological phenomena of tornadoes and to determine how villagers can prepare themselves to avoid devastation. The IG-WRDRR Chairman described the basic characteristics of typical tornados and possible indicators to assess tornados as well as their damage patterns. Discussions were held involving community members and scientists regarding construction of household tornado shelters, resulting in a possible diagram to prepare a shelter house for minimum cost.

4.2 Mini Safe Room (MSR) Project in Bangladesh

4.2.1 Preparatory meeting on in-house type small shelter
As shown in Fig.2, “The International Forum on Tornado Disaster Risk Reduction for Bangladesh - To Cope With Neglected Severe Disasters” was held on 13-14 December, 2009. Following the forum, a Mini-workshop on Tornado Shelter for Bangladesh was held on January 25-26, 2011 in Dhaka and construction of a Mini Safe Room (MSR) was proposed.

Figure 4 shows a meeting with local people at Saturia Union, Porishad in Manikanj District on January 25, 2011. We discussed their experiences of encountering tornados, the necessity for mitigation means for tornado-induced disasters, and practical ideas for protecting lives from tornados. Figure 5 shows a photo of the Mini-workshop on Tornado Shelter for Bangladesh at BDPC in Dhaka with people from a tornado affected area and a structural designer, discussing practical ideas for in-house shelters. Finally, a mini safe room with a plan of 1m × 2m and depth of 1m constructed of bricks and reinforced concrete was proposed.

![Fig. 4 Meeting with local people at Saturia Union, Porishad in Manikganj District, January 25, 2011](image1)

![Fig. 5 Workshop on Tornado Shelter for Bangladesh with participation of people from tornado affected area and a local structural designer at BDPC in Dhaka, Bangladesh, January 26, 2011](image2)
4.2.2 Design and construction of MSRs in Rampur

Two prototype MSRs were constructed in two houses in Rampur: one with steel cover panels (MSR1) and another with wooded cover panels. Figure 6 shows the construction processes of the MSR. The construction period was almost one week, and the cost for one MSR was 380USD.

Figure 7 shows Meetings at Balla Bazar Union and Balla High School in Rampur, Bangladesh on January 14, 2013, in which around 1,000 people gathered to share information on tornado disaster risk and suggesting ways of saving lives.
do disaster risk in that region, some important signs of tornado occurrence, ways of saving lives from tornados, efficiency of MSRs, and so on.

4.3 Workshop on Tornado Disaster Risk Reduction in Bangladesh

The Workshop on Tornado Disaster Risk Reduction was co-organized by IG-WRDRR, BDPC, and SEEDS Asia on January 15, 2013, and hosted by the Bangladesh Meteorological Department (BMD) in Dhaka, Bangladesh.

Experts on tornados and induced disasters from Japan, USA, Canada, India were invited, and representatives of the Bangladesh Government, the United Nations, NGOs, and academia participated in the workshop. Recent activities of IG-WRDRR, state-of-the-art information and knowledge on early warning systems, and recent tornado disasters, were discussed, and priorities for actions to reduce tornado disaster risk were proposed.

5 BROCHURES ON PREPAREDNESS FOR WIND-RELATED HAZARDS IN HAITI

The Haiti Earthquake occurred on January 12, 2010, and caused severe damage to the Port-au-Prince area. Fatalities numbered almost 200,000. Haiti is located in a strong-hurricane-prone region, and it faced a hurricane season following the severe earthquake damage, which made it more vulnerable to wind hazards. Thus, IG-WRDRR prepared brochures in English and French in March, 2010, as shown in Fig.9, to warn Haitians about the possibility of coming wind-related hazards as well as to provide them with basic guidelines for mitigation.
Fig.9  Brochure on preparedness plan for hurricane season for Haiti (April, 2011)

The brochure recommended that local people and authorities have a “Preparedness Plan” for wind-related disaster prevention and reduction. These brochures were distributed to Haitians, central and local governments of Haiti, UN organizations and other supporting and donor agencies in various ways. They were also available through UN/ISDR PreventionWeb, IAWE website and others.

6 APEC-WW & IG-WRDRR JOINT WORKSHOP AND 4AMCDRR PRE-CONFERENCE EVENT

IG-WRDRR was involved in organizing “IG-WRDRR & APEC-WW Joint Workshop on Wind-Related Disaster Risk Reduction Activities and Inter-organizational Collaborations” and “Climate Change and Wind-Related Disaster Risk Reduction Activities in Asia-Pacific Region” in Inchon, Korea, on October 24, 2010, as shown in Fig.10. The latter was a Pre-conference event of the 4th Asian Ministerial Conference on Disaster Risk Reduction.

The purpose of these workshops was to share the current status and activities of WRDRR in the Asia-Pacific region. It was found that member economies of APEC-WW (Regional Harmonization of Wind Loading and Wind Environmental Specifications in Asia-Pacific Economies) have different wind climates and different levels of extreme/strong wind risks. All member economies engaged in some forms of WRDRR activities with varying degrees of support and participation at national, state/provincial and district levels, including wind damage assessment, wind-related disaster reduction activities and natural disaster mitigation strategies. It was also found that various WRDRR activities received varying degrees of acceptance by the general population and achieved varying degrees of success. Overall, APEC-WW & IG-WRDRR Joint Workshop and 4AMCDRR Pre-Conference Event shown in Fig.11 provided a good platform for mutual exchange of information and knowledge between wind engineering experts, people working on DRR in various organizations, and policy makers.

Fig.10 IG-WRDRR & APEC-WW Joint Workshop on Wind-Related Disaster Risk Reduction Activities and Inter-organizational Collaborations in Inchon, Korea, October 24, 2010
Discussions were held on the fact that even though science and technology have been significantly developed, the number of natural disasters and damage are increasing. It was realized that it is necessary to consider how to minimize the risk of future wind-related disasters, which continues to escalate with population shifts towards urban centers located in the paths of typhoons/cyclones and the impending threat of their increased intensity and frequency as hypothesized by potential climate change. In addition, people agreed that severe local wind disaster risk reduction continues to be very challenging because it is difficult to forecast and give warning without advanced detecting systems. To cope with these identified main challenges or constraints, it is considered necessary for IG-WRDR to support the development of user-friendly local guidelines on wind-resistant design for developers/constructors, and to identify the importance of better assessing climate change impacts on the frequency and intensity of wind-related hazards at the country level.

Fig.11  4AMCDRR Pre-Conference Event Climate Change and Wind-Related Disaster Risk Reduction Activities in Asia-Pacific Region in Inchon, Korea, October 25, 2010

7 WIND HAZARD RESILIENT CITIES: NEW CHALLENGES(ISWE5)

The 5th International Symposium on Wind Effects on Buildings and Urban Environment ‘Wind Hazard Resilient Cities: New Challenges’ was co-organized with Tokyo Polytechnic University (TPU) Global COE Program (GCOE), IAWE, Council of Tall Buildings and Urban Habitat (CTBUH), Japan Association for Wind Engineering (JAWF), Architectural Institute of Japan (AIJ), Japan Society of Civil Engineers (JSCE), Japan Society of Atmospheric Environment (JSAE), Meteorological Society of Japan (MSJ) and The Society of Heating, Air-Conditioning and Sanitary Engineering (SHASE) on March 7 and 8, 2011, in Tokyo, Japan, as shown in Fig.12. Recently, the number of severe wind incidents that caused loss of life, serious societal impact and threats to national as well as regional security has been increasing. The effects of rapid urbanization, global warming and climate change are now regarded as indirect causes of these disasters. Rapid urbanization and population concentration from burgeoning economic development in Pacific-rim countries have increased energy consumption and worsened air quality as well as thermal comfort in urban environments. In order to tackle these problems, it is essential to reduce energy consumption by utilizing building ventilation and also to reduce air pollution as well as heat pollution by actively promoting urban ventilation. The primary purpose of this symposium was to provide an ideal venue for exchanging and sharing information through discus-
sion, so that serious wind-related problems regarding wind hazard risk due to meteorological turbulence such as typhoons and tornadoes, urban air pollution and increase of environmental load can be solved. The forum aimed at contributing to the development and construction of sustainable urban environments with low energy built environments and hence to achieve wind hazard resilient cities.

Fig.12 5th International Symposium on Wind Effects on Buildings and Urban Environment (ISWE5) ‘Wind Hazard Resilient Cities: New Challenges’ in Tokyo, Japan, March 7-8, 2011

8 SIDE EVENT “SAVING OF LIVES AND IMPROVED COASTAL RISK MANAGEMENT THROUGH REGIONAL COOPERATION IN OCEAN AND MARINE RELATED EARLY WARNING SYSTEMS IN ASIA” AT THE 3RD SESSION, GLOBAL PLATFORM FOR DISASTER RISK REDUCTION

This side event was co-organized with TPU GCOE, UNESCAP, UNESCO-IOC, and WMO on May 10, 2011, in Geneva, Switzerland, as shown in Fig.13. The following describes its concept. Coastal regions are recurrently affected by disasters induced by natural hazards, such as tropical cyclones, storm surges, tsunamis, and coastal flooding. Thus, tackling effective disaster risk management in coastal regions requires a multi-hazard approach.
Asia has been disproportionally affected by these phenomena, experiencing massive devastation, which sets back socio-economic development of countries and coastal communities by years if not decades. However, over the last few decades, significant numbers of lives and livelihoods have been saved through cooperation between governments, regional centers and agencies, NGOs, the private sector and the academic community in this region, particularly in the case of tropical cyclones, storm surges and tsunamis. This side event demonstrated lessons learned and benefits realized through effective coordination and cooperation in early warning systems with a multi-hazard approach, promotion of effective risk management solutions, and education.

9 SPECIAL SESSION ON “INTERNATIONAL CONCERTED ACTIONS FOR WIND-RELATED DISASTER RISK REDUCTION” AT 13ICWE

A special session on “International Concerted Actions for Wind-Related Disaster Risk Reduction” was co-organized with IAWE and TPU GCOE on July 11, 2011, at the 13th International Conference of Wind Engineering held in Amsterdam, as shown in Fig.14. Ms. Margareta Wahlstrom, Special Representative of the Secretary-General for Disaster Risk Reduction, United Nations International Strategy for Disaster Reduction, introduced the disaster reduction activities within the UNISDR framework. She emphasized that the majority of natural disaster economic losses in the world are caused by extreme wind events and accompanying water hazards. She also stressed the importance of considering the changing climate as a factor in assessing disaster risk reduction. Mr. Rahman from Bangladesh stressed the necessity to upgrade the overall ability of the country and people for DRR. Financial support from developed countries does not necessarily work efficiently in reducing the damage risk in a developing country at the local community level. The Chairman of IG-WRDRR introduced the recent activities of IG-WRDRR towards damage mitigation. Speakers from BDPC, UNESCO, WMO, Munich Re., and IFRC-RCS presented their current activities on DRR. The functions of IG-WRDRR are to establish linkages and to coordinate various communities to serve as inter-agency coordinators with a charter to work with international organizations involving agencies of the UN and involved NGOs, and to empower them with the responsibility to serve as a bridge between policy makers and agencies responsible for actually carrying out the DRR at the local community level.
The knowledge and information base and their resources concerning wind damage mitigation to
the society to assist in its mitigation efforts were shared with each other. These presentations
were followed by a panel discussion with representatives of NGOs, UN/ISDR, WMO and stake-
holders. It was pointed out that current structural design including wind design focused on indi-
vidual building performance, rather than on DRR, which required more discussion in the wind
engineering community.

10 OTHER ACTIVITIES RELATED TO IG-WRDRR

In order to prompt cooperation with other international organizations and to contribute globally
to WRDRR, the IG-WRDRR Chairman (the author) participated in the following cooperative ac-
tivities in disaster risk reduction: the 6th Meeting of the Asia Regional Task Force on Urban
Risk Reduction (UN/ISDR) in Kobe on January 14, 2010; the 4th APEC Emergency Manage-
ment CEOs’ Forum (UNCRD, MOFA Japan) and the International Disaster Management Sym-
posium - Urban and Climate Risk Management for Sustainable Development 2010 in Kobe on
January 18-20, 2010; Asian Conference on Disaster Reduction 2010 (SAARC: South Asian
Association for Regional Cooperation) in Kobe on January 17-19, 2010; Typhoon Committee
(UNESCAP & WMO) in Singapore on January 25-29, 2010; the 7th Meeting of the Asia Re-
Regional Task Force on Urban Risk Reduction (UN/ISDR) in Kobe on January 13, 2011; Asia
Oceania Geosciences Society AOGS2011 in Taipei on August 11, 2011; and Typhoon Commit-
tee (UNESCAP & WMO) in Hangzhou on February 7, 2012.

REFERENCE

CADRR, 2009, Proceedings of Cooperative Actions for Disaster Risk Reduction (CADRR), The
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