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From Knowledge to Practice: Building Back Stronger
After Haiyan with the Aid of Science
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(Standard Greetings)

First of all, I congratulate the organizers of this year's IRDR Conference. Thank you for the warm hospitality and the excellent arrangements.

Future cities are not built after our time. We start building them today. Communities, fifty years from now, will look different and people will live differently. Their realities will not be defined in their time, but in the lifetime of generations before them.

Exactly twenty-three years ago today, the prelude to the 20th century's second largest volcanic eruption was recorded. Mt. Pinatubo's magma reached its surface on this date in 1991 after laying dormant for more than 500 years.

The effects of the eruption were felt worldwide. Global temperatures dropped by about 0.5 °C and 10 cubic kilometers of rock and ash were generated by the eruption, enough to bury the District of Columbia to a depth of 128 feet.¹

¹ <http://denali.gsfc.nasa.gov/research/so2/article.html>

The world's attention was focused once again on the Philippines more than six months ago when Haiyan, the world's strongest typhoon to make landfall, hit our country.

Entire towns and cities in Central Philippines were flattened, affecting nearly 10 million people. More than 6,000 people perished, and to date, a thousand more are missing.

Damages and losses, including destruction of physical assets; decline in production, sales and income; and the value of increased operating costs resulting from the disaster, are estimated at US\$12.9 billion.²

² Reconstruction Assistance on Yolanda Report, 16 December 2013.

The infrastructure damage, lack of market access and disrupted cash flow due to Haiyan resulted in lost income sources for almost six million workers.³

After Haiyan, we usually hear the question, *“What could we have done better?”* Others would say, *“I wish I had known of the risks before.”*

An assessment of Tacloban, which greatly bore the brunt of the storm’s impact, showed that the city’s location is highly susceptible to disaster risks. The geohazard map for Tacloban showed a province massively covered by color purple on its outskirts and red within – meaning to

³ Ibid.

say, the coastal areas were susceptible to flooding, while the inland was highly susceptible to landslides. The map's color coding scheme represented susceptibility to landslides and flooding; but the people did not know any of that.

Before Haiyan, there were two precedent disasters of almost the same magnitude – a typhoon and tidal wave in 1897 and a typhoon in 1912 both caused great devastation in Central Philippines and Tacloban was among those severely affected.⁴ It could have been a saving factor had the cities and provinces affected then took these past experiences into account. It could have saved more lives if

⁴ *A history of storms: 1890s newspaper reveals devastating Leyte typhoon*, GMA News Online, 16 November 2013

we have already learned our lesson from these earlier disasters.

We recall that days before Haiyan hit land, there were public warnings from the weather bureau and preemptive evacuation was carried out in the coastal areas. Emergency relief resources were prepared and prepositioned, including more than 84,000 family food packs, assorted medicines, medical supplies, cot beds, and other essential materials worth P328.7 million.⁵ As we have seen, those preparations were not enough.

What went wrong then?

⁵ FAQ: Government's Immediate Response to Typhoon Yolanda, Presidential Management Staff (<http://gel2014.wordpress.com/2014/05/02/faqs-governments-immediate-response-to-typhoon-yolanda/>), 2014

A disaster management expert said that “even the best-prepared nation would have a hard time bracing itself against the effects of such a storm.”⁶

We cannot, however, submit ourselves to utter helplessness in the face of mounting disaster risks. We need to be in control, and the only way that can happen is to embrace the lessons learned from Haiyan and to move forward not just with the resolve, but with the tools, to do better the next time around.

⁶ Kathryn Hawley in *Conversations with disaster experts* by Marites Vitug, Rappler.com

Lessons from Haiyan

I wish to share these lessons with you and hope that we can learn them by heart so we can save more lives when future natural hazards occur.

First, we must focus on managing the risks rather than managing disasters. Disaster risk management should not be carried out only before calamities happen. We can craft the best policies, prepare the best plans, and design the best programs, but without the understanding and support of our people, these preparations will amount to nothing.

Our local government units should be at the forefront of the planning, preparations and execution of the plans and

measures because a local government unit that is uninvolved, ill-prepared and one that is detached from climate change realities cannot provide an effective “first line of defense” against disaster risks.

Our local disaster risk reduction and climate change adaptation plans must be crafted to address these threats and we must ensure that funds are sufficiently allocated to effectively carry out these plans.

Effective governance and stronger implementation of laws are crucial. There is a clear need to raise the standard for building structures. For instance, coastal structures, including roads and bridges, should be built and

designed, taking into consideration projected sea-level rise due to climate change.

Second, *we must let science work for our communities.* The best solutions are possible only with the guidance of science. The dictum is not just to build, but build stronger and “build better.” We have to build for the future.

We need science in developing land use plans that are risk sensitive. The responsibility of planners rests not just in the present generation. We have to make sure that the safety and well-being of present and future communities are not compromised by the unrelenting wave of urbanization. Hazard maps can provide a good foundation for the work of our planners and builders.

We have to give our scientific experts the wherewithal to do their role of gathering, validating and processing scientific data that will enable the accurate prediction of events. These are indispensable inputs to designing practical solutions and communicating the risks to our people because knowing when, where and in what magnitude a typhoon will strike is fundamental to keeping our people prepared.

With high reliability of disaster data, the private sector will also be better equipped to carry out its role in disaster risk planning, preparedness and response. They would also be more confident to enter into risk financing schemes without fear of massive losses.

The greater challenge here is to translate knowledge into practice. It is not enough that climate scientists know the risks. Governments, local leaders and the people on the ground should understand the vulnerability of their communities and be equipped with options, resources, and the tools to enable them to become drivers of action in their respective communities.

This brings me to the third key lesson. *We should all be disaster-literate.* Sound policies and political will to implement do not complete the formula for effective disaster prevention. Action needs to come from the communities themselves. Early and mandatory evacuation would be useless if the people do not understand the need

for such efforts. Our experience with Haiyan underscores this fact.

Authorities warned communities about storm surges that may reach up to six meters high and many citizens stocked up on food, secured their homes and stayed indoors, not knowing that it was not the kind of preparation for a storm surge. Even those in evacuation centers were not spared from the deadly onslaught of the storm surges.

Was it a case of inadequate information or a case of information not being understood and appreciated by national and local officials, and by the people on the

ground? People had no notion of storm surges, plain and simple. In the end, it cost thousands of lives.

Raising public awareness should be made to resonate loudly and as far deep into the communities as possible.

Fourth, we must protect our environment and pursue green urban development. Building on good risk reduction practices means going back to the very basics. We must protect our environment which supports human life and provides the basic materials for our economy, including food, fuel and clean water.

We must protect our ecosystems and natural buffers such as mangrove forests that help mitigate floods, storm surges and other hazards.

The people of General MacArthur, a small town in Eastern Samar province in the Philippines, have their mangroves to thank as these protected them from the wrath of Haiyan. The town was spared from massive destruction since the mangroves served as buffer against the storm surge. Nearby coastal towns without mangroves suffered a different fate.⁷

Finally, *we should prepare adequately and engage.* With adequate and proper preparation, we would already have

⁷ *Samar Mangroves Remain Resilient*, The Manila Times, May 12, 2014

won half the battle. We must have contingency plans that are crucial in times of disasters.

Communities must draw and test regularly their response plan way ahead of any disaster event and improve constantly on early warning systems and emergency management capacities.

Leaders must have the political will to implement forced evacuation when called for.

There are no short cuts to building or designating community shelters. We need pre-designed community shelters that are located in safe areas. We need to be

prepared with basic supplies such as food, water, medicine, blankets, latrines and toiletries.

Local disaster risk reduction and management officers serve as “Sherpas” to community members, leading and mobilizing them in times of impending distress. Quick communication, particularly real-time updates, is vital as well to ensure that first responders and search and rescue teams are ready for dispatch anytime.

The island of Tulang Diyot in the Municipality of San Francisco, Cebu Province was also directly hit by Haiyan. All 500 houses in the island were destroyed but the entire population was saved because of prompt evacuation led by former Mayor Alfredo Arquillano, a UNISDR

champion. We do not only need leaders on the ground. We also need community members who understand the situation and heed the call of their leaders. Post-disaster action was also crucial, as authorities have effectively prevented the evacuees from returning to their hazard-prone areas.

The municipality is a 2011 UN Sasakawa Awardee for Disaster Reduction because of their Purok System, which focuses on addressing the vulnerability of every village in the municipality by mobilizing local resources in creating local and practical solutions based on the unique needs of every community.

Role of science in disaster resilience

We need a science-based governance in building disaster resilience and in managing hazard-associated risks.

For the Philippines, an archipelagic country with one of the longest coastlines in the world, science is practically the “bread and butter” of our disaster risk management system.

In 2012, the Philippine government, through the Department of Science and Technology, launched Project NOAH, or the Nationwide Operational Assessment of Hazards. It is a program that uses science and technology in building capacities for disaster risk reduction and management.

A website has been built to enable people to see real time updates and accurate information on weather predictions, flood forecasts, rainwater level and landslide warnings.

Project NOAH also features the Disaster Risk Exposure Assessment for Mitigation - Light Detection and Ranging or DREAM-LIDAR Project, which seeks to produce accurate flood inundation and 3D hazard maps for the country's flood-prone and major river systems and watersheds. It also seeks to identify landslide-prone areas.

We still have a long way to go in widening the reach of our efforts, but the resolve is more pronounced than ever. In all of these, science is our ally.

We need science in updating our geo-hazard maps and establishing effective early warning systems.

We need science in strengthening building codes and making risk-sensitive land use plans that are linked into yearly investment plans of governments.

We need science in capacitating the private sector, especially the micro, small and medium enterprises, as we urge and support them in creating business continuity plans that reflect corporate strategy on how to swiftly spring back to operations after each disaster.

We need science in providing the depth and breadth of information that the public needs.

Closing

Today, I am pleased to be a part of this assembly of individuals from different countries, with diverse disciplines and backgrounds who have come together to exchange knowledge and devise strategies. We must use this opportunity not just to gain knowledge from one another, but also to transform that knowledge into concrete actions.

Tragedies such as Haiyan, the 2011 Japan tsunami and the 2004 Indian Ocean tsunami, and the disasters of the past decades and centuries create the context for learning and

growing. It is these disasters that compel action from everyone.

I wish to end by reiterating our roles as builders, not just of communities of today, but communities of the future. We must not rebuild the risks. We must rebuild stronger and wiser.

Thank you.