

Catastrophic Disasters as Opportunities for Sustainable Reconstruction: The Case of Typhoon Yolanda

Andrea L. Santiago

De La Salle University, Manila, Philippines

Fernando Y. Roxas*

Asian Institute of Management, Philippines

ffyanroxas@aim.edu

The after effects of Typhoon Yolanda have forced the country to rethink its strategy with respect to serious calamities. We believe that the country should also think about the devastation as an opportunity for shifting to “sustainable reconstruction” by which infrastructure is rebuilt with the long-term view, taking into account the impact of reconstruction on the environment, economy, society, technology, and institutions at each stage of the process. This approach is far better than recreating the status quo ante. In response, the Philippine government crafted the Yolanda Comprehensive Rehabilitation and Recovery Plan, which incorporates current best practices. The strategic shift is to increase investments in disaster mitigation, prevention, and preparedness rather than mere response, rehabilitation, and recovery. The evaluation of the 8,000 page, 8-volume document reveals a model that looks beyond physical structures and works toward rebuilding a community that learns to live sustainably. The challenge is ensuring that the sustainable reconstruction plans are implemented as envisioned.

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INTRODUCTION

Many cities around the world were built at a time when population growth was manageable and when little attention was given to sustainable development. Today, all nations are facing the effects of uncontrolled development—natural disasters are more frequent and more intense than ever experienced. This has prompted international agencies, governments, and urban planners to rehabilitate cities or build new ones that are more resilient to disaster while promoting sustainable living. The Asian Development Bank (2013) advocated for greater investment in resiliency. For wealthier nations, the transformation is taking place. For developing nations, this is still to be achieved. But what if there is an opportunity to start anew?

Tropical storm Haiyan, known locally as Yolanda, hit the central group of islands of the Philippines in November 2013. With winds racing at 315 kilometers per hour (kph), more than 6,000 people were killed despite storm alerts meant to minimize casualties (Office of the President, 2013). Property damage was reported in the billions, as entire cities were wiped out, displacing 1.4 million families (Global Facility for Disaster Reduction and Recovery, 2014). The far bigger tragedy in the aftermath of the relief efforts is the belief that the city can be rebuilt sans orchestrated planning.

In reality, it is almost impossible to prepare adequately for a freak of nature that was Yolanda. Japan, surely one of the most disaster prepared country in the world, was not able to substantially mitigate the Fukushima earthquake in 2011 (Iwata, Ito, & Managi, 2014; Matsuoka & Shaw, 2012; Panda, 2012; Tweed & Walker, 2011). Neither was the United States geared up for the devastation of Hurricane Katrina (Committee on Homeland Security and Governmental Affairs, 2006). Evidently, natural disasters can reach catastrophic levels that require a different kind of planning.

Amidst the destruction that can literally wipe out cities, there is an opportunity to start afresh. However, there will always be pressure to return to normalcy at the shortest time possible (Ingram, Franco, Rumbaitis-del Rio, & Khazai, 2006). In haste, governments may rebuild cities without improving the quality of life of the community. This happens when post-disaster reconstruction (PDR) is about bricks and mortar, neglecting the need to address societal infrastructure. For better quality of life, government should pay attention to “social, health, economic, and environmental conditions that affect human and social development” (Natural Hazards Research and Applications Information Center [NHRAIC], 2001, p. 4-2). By adapting a sustainable reconstruction approach, governments and communities may help reduce the vulnerabilities to disaster while conserving resources for future generations. Stated positively, sustainable reconstruction helps build societies that are more resilient.

Learning from the PDR of Aceh, Nias, Sri Lanka, Myanmar, and Haiti, the Philippine government decided it would rebuild the areas devastated by typhoon Yolanda, better, safer, and faster (Larkin, 2014). Weathering the initial shock and taking stock of the damage, the task of rehabilitating towards a better state and not simply restoring the physical structures of towns and cities had begun to take shape. Almost a year after the devastation, the Philippine President approved and signed the Yolanda Comprehensive Rehabilitation and Recovery Plan (CRRP), an 8,000-page, 8-volume document containing 18,648 programs to build resilient communities in 171 cities and municipalities affected by the typhoon. The Yolanda CRRP is expected to cost almost US\$4 billion that will be funded from the national budget. The target is to have at least 80% of the projects completed by 2016 (Marcelo, 2014).

CLIMATE CHANGE AND SUSTAINABLE CITIES

The reasons for, and the effects of, climate change are by now well-known. Currently, countries are confronted with finding better and different ways to arrest the consequences of climate change, constrained by their existing capacities. There is certainly a desire to improve conditions for sustainable living to take place. However, countries do not live in self-contained domes. For any real solution to take place, one must invariably address the issue of wealth imbalance. Thus, attention has been drawn to inclusive growth, one that prepares for an estimated nine billion people by 2050 (World Bank, 2012). However, it is not one where those in need sit on the sidelines while those who have continuously provide dole outs. It is one where each nation, each institution, and each citizen does his or her part to work towards green growth.

While population is growing larger, land area is not. Thus, there is a tendency to build taller buildings particularly in the metropolis, increasing population density. This has exerted stress on cities that were originally designed to accommodate fewer inhabitants. As more and more people creep into the city due to rural outmigration, the reaction within cities is to adjust the physical environment mostly in a haphazard manner. Thus grew an entangled web of infrastructure that served as a catch basin for pollution, congestion, and criminality (Stratmann, 2011). This in turn increases hazards and disaster risks.

While people of all nations feel the impact of climate change, the United Nations Human Settlements Programme (2011) reported that those who have access to wealth are better off in preparing for, and recovering from, any disaster. The hardest hit are the marginalized and living in precarious conditions, likely in highly congested cities located near the coast (Thomas, Albert, & Perez, 2013).

The United Nations Human Settlements Programme (2011) highlighted the impending challenges of coastal cities, particularly in Asia, amidst the unpredictable nature of natural calamities. Home to a third of the world's population, coastal cities are greatly affected by rising sea levels that inevitably lead to coastal erosion, flooding, and saltwater intrusion, among others (Li, 2003; Sekovski, Newton, & Dennison, 2012; World Bank, 2010). It is also more susceptible to hurricanes and storm surges.

The number and intensity of natural and man-made disasters is expected to rise even further together with the rise in population (United Nations Human Settlements Programme, 2011). Earthquakes are now more frequent and strong category hurricanes now comprise 35% of all hurricanes, having almost doubled in the last years. Flooding, which is a natural consequence of heavy rains, has also become more frequent and severe.

To mitigate the effects of climate change, it is inevitable that local government units revisit the current state of their cities. Depopulation is one strategy that governments can use. However, since people will naturally flock to where there is economic activity, any move to relocate inhabitants must include a livelihood component.

Other alternatives call for reconfiguring the smaller-sized rural and urban towns and cities where population densities are smaller to make them more sustainable (Stratmann, 2011). Governments can do this in tandem with rebuilding older cities. There is also the option of constructing new sustainable or green cities as done by Malaysia, India, Korea, and China, to name a few within the Asian region (Kim, Han, & Na, 2006; Xue, Wang, & Tsai, 2013). The advantage of a new town or city is that it can support economic growth as it creates a new tax base.

Sustainable urbanization calls for balancing the economic, environment, and social requirements for today and the future (Rasoolimanesh,

Badarulzaman, & Jaafar, 2012). It fosters a community that values “social equality and equity, economic vitality, environmental responsibility and infrastructural effectiveness” (Malick, Rahaman, & Vogt, 2011, p. 234). This means that sustainability assessments can be used to help governments align their policies to minimize trade-offs, ensuring that the tensions between and among the three areas are addressed, resulting in net benefits (Newman, 2008).

SUSTAINABLE RECONSTRUCTION

Bouncing forward or building back better has begun to find its way in literature (Da Silva, 2010; Fan, 2013; Kennedy, Ashmore, Babister, & Kelman, 2008; Manyena, O’Brien, O’Keefe, & Rose, 2011; Sudmeier-Rieux, 2014). Rather than viewing disasters as grave misfortune, Fan (2013) argued that disasters should be seen as opportunities for renewal. Such was the thinking when Tokyo was reconstructed after the Great Kanto earthquake in 1923 (Schencking, as cited in Fan, 2013, p. 2). It was the same thinking, which was used to rebuild Aceh and Nias that received large funding support following the 2004 tsunami (Fan, 2013). Beyond structural changes however, “build back better” calls for institutional transformation and rebuilding trust.

Sustainable reconstruction is likewise a new term in literature and this has not been clearly defined (Guarnacci, 2012). The United Nations Environment Programme and SKAT (2007) referred to sustainable reconstruction as the manner by which infrastructure is reconstructed with the long-term view in mind, taking into account the impact of reconstruction efforts on the environment, economy, society, technology, and institutions at each stage of the reconstruction process. It is an integrated approach to rebuilding cities sustainably, suggesting that any such program must be aligned with a strategic or master plan.

Following the principles of sustainable development, sustainable reconstruction considers the interrelationship between environmental responsibility, economic vitality, and social equity. Mileti (as cited in NHRAIC, 2001) broke this down further and posited that reconstruction should enhance quality of life, enhance economic vitality, ensure social and intergenerational equity, enhance environmental quality, incorporate disaster resilience and mitigation, as well as the use of a participatory process. Sustainable reconstruction is not simply rebuilding infrastructure that are sturdier or greener, although disaster-resilient structures should be the minimum standards. It is also about supporting livelihood and building a community, which adapts sustainable living practices (World Bank, 2014).

Certainly, sustainable reconstruction calls for a holistic and integrated urban design and planning (Stratmann, 2011). It may mean reconfiguring the entire city so that the standards of living are raised, while economic activity is enhanced. Reconfiguring a city is a big challenge since it may mean relocating some households from unsafe sites or from sites that impede new road networks (Imura & Shaw, 2009). Further, resettling households may mean distancing resettled families from their livelihood. This may have future repercussions if sustainable means of transportation are not available to bring them to their place of school or work (World Bank, 2014). Livelihood is a necessary component of sustainable reconstruction since it provides options for community members to settle down in less hazardous areas (Pasteur, 2011).

The foregoing arguments make it evident that sustainable reconstruction entails more careful planning since it has to balance the needs of the environment as it addresses both the economic and societal needs of its inhabitants. It considers long-term effects as it meets present needs. As such, it will take a longer time to complete. Amidst pressures to rebuild quickly, reconstructing cities

using this approach requires political will and an enormous amount of trust among the people, not to mention the huge amount of resources it will require. Thus, governance is essential for sustainable reconstruction to take place (Guarnacci, 2012). The elements of governance that are relevant would be accountability, transparency, and a bottom-up approach. If done right however, a city that was once a magnet for disaster becomes an inclusive city that is more resilient.

THE PHILIPPINES AND TYPHOON YOLANDA

Similar to other countries, the Philippines has had its share of natural calamities that have grown in frequency and in intensity (Thomas et al., 2013). At least for the Asia-Pacific area, Thomas, Albert, and Hepburn (2014) attributed the “new normal” (World Bank, 2014) to anthropogenic climate change. Population exposure and climate hazards contribute to this phenomenon further.

It comes to no surprise that the Philippines, a country, sitting along the Pacific rim, composed of over 7,000 islands with coastline that stretch over 36,000 kilometers (22,000 miles) is prone to geophysical as well as hydro-meteorological and climatological disasters (Co, 2010; Gaillard, Pangilinan, Cadag, & Masson, 2008; Iuchi & Esnard, 2008; Luna, 2001; Peñalba, Elazegui, Pulhin, & Cruz, 2012; Victoria, 2002). In 2001, the United Nations University Institute for Environment and Human Security ranked it third in the world in terms of disaster-prone area (Thomas et al., 2013, p. 20). Yet towns and cities, especially those located along the coasts, were not built to withstand natural disasters of immense intensity. To compound the situation, poverty has driven local folk to denude forests as well as destroy coral reefs and mangroves (Yeung, 2001). These have damaged the country’s natural defenses against calamities,

further exacerbating the country’s vulnerabilities. Within this scenario, came typhoon Yolanda.

The Philippines faced the strongest typhoon ever to hit the earth on November 8, 2013 (Aquino, as cited in Development Asia, 2014). It came just three weeks after a strong earthquake rocked Bohol in central Visayas and after a strong typhoon hit the southern part of the main island of Luzon. The Philippine Atmospheric, Geophysical and Astronomical Services Administration (Pagasa) that renames typhoons that enter the country’s area of responsibility in a system readily understood by locals, dubbed internationally known typhoon Haiyan as Yolanda. This level-5 typhoon ravaged 117 cities and municipalities located in the Visayas region, the centrally located group of islands in the Philippines (National Disaster Risk Reduction & Management Council [NDRRMC], 2014). Most structures in the country are not built to withstand winds of over 200 kilometers per hour so that it came to no surprise that the 315 kph wind velocity knocked down infrastructures as if these were built with match sticks. Even if it had the resources to do so, it was a disaster that the country could not have prepared for. After all, how does one prepare for the unimaginable?

Fortunately for some, the news that a super typhoon was approaching allowed local government units to forewarn residents to move to higher ground. In a small island between the provinces of Cebu and Leyte, more than a thousand residents heeded the warning. Their local government was able to successfully evacuate to another town. While the typhoon badly damaged the infrastructure in their hometown, the evacuation saved their lives (Malig, 2013). This was not the case for larger cities where people, used to frequent typhoons, shrugged the warning off. There were those who insisted on staying put to protect their houses and worldly possessions instead of moving to higher grounds. In the aftermath, even those who took heed and moved to evacuation centers was not guaranteed

safety since some of these centers were flooded and some evacuees drowned (Enriquez, 2013). Despite a mandate from the President that there be zero casualties, the death toll reached 6,300. The numbers could have been far worse (Oxfam, as cited in Larkin, 2014).

Typhoon Yolanda affected 44 of the 81 provinces in the country (Aquino, as cited in Development Asia, 2014). It was reported that 16 million suffered from the onslaught, of which 4 million people were displaced. Already marginalized even before the typhoon, half of those displaced continue to live in non-durable shelters that make them vulnerable to future calamities (United States Agency for International Development, 2014). More than a million homes were damaged and total disaster cost amounted to about US\$2 billion (NDRRMC, 2014). National Economic and Development Authority (NEDA, 2013) estimated total damage at about US\$12 billion, with about 25% accounted for by loss in productivity. This amount includes the losses shouldered by the private sector that bore the brunt of the damage.

In the Philippines, disaster management falls under the jurisdiction of the National Disaster Risk Reduction and Management Council (NDRRMC) as mandated by the Philippine Disaster Risk Reduction and Management Act of 2010 (2009). The NDRRMC, composed of Department Secretaries, works together with the Climate Change Commission (CCC) in aiming for safe, adaptive, and disaster-resilient Filipino communities toward sustainable development. Operating with two separate programs, both agencies signed a Memorandum of Understanding harmonizing the Local Climate Change Action Plans and the Local Disaster Risk Reduction Management Plans for the benefit of the local government units (Israel & Briones, 2014).

The NDRRMC was able to craft a National Disaster Risk Reduction and Management Plan (NDRRMP) that covers 17 years from 2011

to 2028 (NDRMMP, 2011). Following four traditional themes, the NDRRMC hopes to be more proactive by channeling more resources in the future to disaster mitigation and prevention as well as disaster preparedness rather than spreading resources equally with disaster response as well as disaster rehabilitation and recovery. However, the massiveness of the Yolanda destruction was a test the NDRRMP was unable to hurdle (Enriquez, 2013). Recognizing the need to take full control of the situation, the Philippine President immediately created the Office of the Presidential Assistant for Rehabilitation and Recovery (OPARR). The main task of the OPARR was to serve as the supra-manager, coordinating with relevant units, for a unified strategic vision (Official Gazette, 2013). It is this mandate that gave rise to the Yolanda CRRP.

THE YOLANDA CRRP: A CASE FOR SUSTAINABLE RECONSTRUCTION

In record time, the National Economic Development Authority (NEDA) as support unit to the NDRRMC, drew up the Reconstruction Assistance on Yolanda (RAY) as the overall plan to guide the country's recovery to be implemented by OPARR (NEDA, 2013; World Bank, 2014). Following the concept of "build back better", NEDA supported the construction of more disaster-resilient infrastructures and recognized that government should give assistance to the private sector for the revitalization of enterprises that would bring back economic activity in the devastated areas (NEDA, 2013). The RAY, supplemented by the Post-Disaster Needs Assessment (PDNA) conducted by the Office of Civil Defense, served as the guiding document for the drafting of the Yolanda CRRP, the country's sustainable reconstruction program for the 171 cities and municipalities affected by typhoon Yolanda (Kabilig, 2014).

In contrast to the RAY that was a top-down plan, the Yolanda CRRP utilized the bottom-up approach. Each of the 171 cities and municipalities had to prioritize their requirements based on the RAY framework. This included identifying areas for housing resettlement that proved to be a challenge for local government units (Tupaz, 2014). That it took only eight months for OPARR to collate Local Government Rehabilitation and Recovery Plan (LRRP) of each affected city and municipality and to ensure that these were aligned with the strategic framework is a feat that was unappreciated by disaster victims (Esmaguél, 2014). After all, many still lived in makeshift tents that did not provide adequate protection from future disasters. It would take another three months before the Philippine president approved the Yolanda CRRP although rehabilitation efforts continued despite the absence of the Yolanda CRRP (Bacani, 2014). Even then, the rehabilitation master plan was released earlier than those from Nepal, Senegal, Pakistan, Haiti, Japan, and the United States (Avendaño, 2014).

Moving away from the four themes of the NDRRMC, the Yolanda CRRP organized rehabilitation efforts into four clusters that naturally followed how the government units operate (OPARR, 2014a). These are the Infrastructure cluster led by the Department of Public Works and Highways (DPWH), the Livelihood cluster led by the Department of Trade and Industry (DTI), the Resettlement cluster led by the Housing and Urban Development Coordinating Council (HUDCC), and the Social Services cluster led by the Department of Social Welfare and Development (DSWD). It is expected that these clusters coordinate with the private sector in line with the Public Private Partnership approach of the government.

The Yolanda CRRP was crafted with three time periods in mind. The immediate period was from time of disaster to May 2014. The medium term is from June 2014 to May 2016 to coincide

with the end of the Administration term. The OPARR targets that the implementing units will complete 80% of the projects by then. The long term period is beyond May 2016.

The broad plans for each cluster appear to support the principles of sustainability. The Infrastructure cluster with an indicative budget of US\$811 million (as cited in Annex B, OPARR, 2014b) is expected to repair, rehabilitate and reconstruct, social, essential, and livelihood infrastructures using an upgraded minimum performance standard and specification as released by the DPWH. Infrastructures include 116 kilometers of national road, 304 kilometers of farm-to-market roads, 22 national bridges, 6 airports, 35 seaports as well as hundreds of school and public office buildings (OPARR, 2014b).

The Social Services cluster, which will receive the smallest allocation of US\$609 million, is expected to ensure that basic social services are delivered for physical and mental well-being. The cluster has the added responsibility of strengthening the capacity to cope with future hazards and disasters. This includes educating locals about the need to protect the environment through mangrove rehabilitation, reforestry, and agroforestry development (as cited in Annex A, OPARR, 2014b)

The third cluster receives the largest fund allocation. The US\$1.748 billion budget is expected to fund over 200,000 housing units and hundreds of community facilities of the Resettlement cluster. Community facilities are essential for mental health recovery. Houses and community facilities will be built to withstand winds of up to 250 kph, with strength of wall and superstructure at 3,000 pounds per square inch, soil bearing capacity at 95 kilopascal, loadings at 50 pounds per square foot and the ability to resist fire for two hours (as cited Annex D of Yolanda CRRP, OPARR, 2014b). Beyond improved construction standards, a total community planning approach will also be undertaken so that it takes into account air

quality, traffic management, and solid waste and sewage disposal (NEDA, 2014). In Tacloban, one of the hardest hit cities, the mayor disclosed that a new township is expected to rise on a 300-hectare property in the northern part of the city (Recuenco, 2014). The new town however will not be sustainable without a livelihood component.

Finally, the Livelihood cluster with a budget of US\$778 million must ensure that the communities are afforded inclusive and sustainable livelihood. While some of the projects still include support for livelihood that the locals are used to, there are proposals for capacity building for alternative livelihood that considers local resources. For instance, Appendix A of the Livelihood Cluster Plan (Annex C) listed six specific strategies for the agriculture sector so that locals can move up the value chain (OPARR, 2014b). As they formally integrate into the economy, the cluster for micro, small, and medium-sized enterprises (MSMEs) would help bridge producers with mainstream markets (Appendix D of Annex C). These strategies fit together neatly with the NEDA (2014) recommendation to prioritize the informal economy and vulnerable groups as part of its inclusive strategies. Meanwhile, locals can be trained with skills needed for reconstruction activities as the agriculture value chains are being rehabilitated.

To monitor the progress of Yolanda CRRP implementation, the OPARR officially launched the e-Management Platform: Accountability and Transparency Hub for Yolanda (eMPATHY) website (Salaverria, 2014). This replaces the Foreign Aid Transparency Hub (FAITH), an online portal used to track donations for Yolanda rehabilitation (Santos, 2014). Based on the website (<http://www.gov.ph/faith>), foreign aid reached a pledge level of US\$1.6 billion, two-thirds of which was in the form of cash. Of the amount pledged, less than 25% was actually received by the end of December 2014.

Even beyond foreign aid, OPARR acknowledges the critical participation of the private sector. OPARR (2014a) reported that over a thousand private sector projects were submitted with a total pledge of about US\$268 million.

The Yolanda CRRP is an ambitious plan that dovetails with the goals of the 2011-2016 Philippine Development Plan for “poverty reduction and creation of quality employment, with equal development opportunities for women, children and men” (NEDA, 2014, p. 6). To visualize the fit, the NEDA developed the Results Framework for Yolanda Recovery and Rehabilitation whereby the short-term outcomes of the four clusters result in the restoration of economic and social conditions of the affected areas as well as poverty reduction in the medium-term. The Results Framework supplements the RAY. Eventually, the Yolanda CRRP should establish “sustainable, resilient regions with high and sustainable growth, able to withstand and recover from disasters faster and better” (p. 5).

With the Yolanda CRRP now approved, the implementation of the sustainable reconstruction program will be transferred to the NDRRMC (Salavierra, 2014). Recognizing that there could be another Yolanda, the mandate and structure of the NDRRMC would need to be revisited. The outgoing head of the OPARR suggested that Congress take a second look at the structure and consider the establishment of a permanent government agency for rehabilitation and recovery efforts (Salaverria, 2014). Even if another Yolanda does not strike the country for many years, the sheer frequency of natural disasters should be sufficient to warrant more investments in disaster management.

CONCLUSIONS

This paper shows that catastrophic disasters should be looked upon as an opportunity to rebuild 21st century towns and cities in a

sustainable manner. After all, it is expected that catastrophic disasters will be the norm and developing countries should be prepared to respond in a timely basis. Previous standards for human habitat systems are no longer adequate since climate change has not only increased the frequency of calamities but their destructive potentials as well.

Examination of the CRRP reveals that the architects of the plan do promote sustainable reconstruction that considers the interrelationship between environmental responsibility, economic vitality, and social equity. A large part of the paradigm change will be the need to shift resource investments into disaster preparedness rather than response and rehabilitation. Moreover, the implementation processes have to be institutionalized. Yolanda's experience has shown that systems breakdown occur when organizations, institutions, and local leaders are themselves affected and immobilized by the calamity.

Future CRRPs can be designed to take into account other aspects of sustainable development that were not explicitly covered by the CRRP. For example, forthcoming recovery plans may wish to be more explicit about technologies to be used as towns and cities are reconstructed in a manner that protects the environment.

REFERENCES

- Asian Development Bank. (2013). *Investing in resilience: Ensuring a disaster-resistant future*. Mandaluyong, Philippines: Author.
- Avendaño, C. (2014, November 9 Month day). Lacson's eMPATHY keeps track of all relief funds. *Philippine Daily Inquirer*. Retrieved from <http://technology.inquirer.net/39333/lacsons-empathy-keeps-track-of-all-relief-funds#ixzz3O3P25qGq>
- Bacani, L. (2014, May 7). Still no rehab master plan six months after 'Yolanda'. *Philippine Star*. Retrieved from <http://www.philstar.com/headlines/2014/05/07/1320377/still-no-rehab-master-plan-six-months-after-yolanda>
- Co, J. C. (2010). *Community-driven disaster intervention: Experiences of the Homeless People's Federation Philippines, Incorporated (HPFPI)* (Human Settlements Working Paper Series: Climate Change and Cities No. 25). London: Human Settlements Programme, International Institute for Environment and Development.
- Committee on Homeland Security and Governmental Affairs. (2006). *Hurricane Katrina: A nation still unprepared*. United States: Committee on Homeland Security and Governmental Affairs .
- Da Silva, J. (2010). *Lessons from Aceh*. UK: Arup/ The Disasters Emergency Committee.
- Development Asia. (2014, May). In the eye of the storm: An interview with Philippines President Benigno Aquino III. *Development Asia*, 18-29.
- Enriquez, K. (2013, December 18). Disaster response put to the test: Lessons from typhoon Yolanda. *The Asia Foundation Asia*. Retrieved from <http://asiafoundation.org/in-asia/2013/12/18/disaster-response-put-to-the-test-lessons-from-typhoon-yolanda/>
- Esmaque II, P. (2014, October 29 Month day). Yolanda a year after: Only 2% of needed houses to be built by Nov 8. *Rappler*. Retrieved from <http://www.rappler.com/nation/73316-yolanda-year-after-houses>
- Fan, L. (2013). *Disaster as opportunity? Building back better in Aceh, Myanmar, and Haiti*. United Kingdom: Humanitarian Policy Group, Overseas Development Institute.
- Gaillard, J. C., Pangilinan, M., Cadag, J., & Masson, V. (2008). Living with increasing floods: Insights from a rural Philippine community. *Disaster Prevention and Management*, 17(3), 383-395. doi:10.1108/09653560810887301
- Global Facility for Disaster Reduction and Recovery. (2014). *Typhoon Yolanda ongoing recovery: Recovery framework case study*. Washington D.C., USA: World Bank.
- Guarnacci, U. (2012). Governance for sustainable reconstruction after disasters: Lessons from Nias, Indonesia. *Environmental Development*, 2, 73-85. doi:10.1016/j.envdev.2012.03.010
- Imura, M., & Shaw, R. (2009). Challenges and potentials of post-disaster relocation. *Asian Journal of Environment and Disaster Management*, 1(2), 199-221. doi:10.3850/S1793924009000029

- Ingram, J., Franco, G., Rumbaitis-del Rio, C., & Khazai, B. (2006). Post-disaster recovery dilemmas: Challenges in balancing short-term and long-term needs for vulnerability reduction. *Environment, Science, and Policy*, 9(7-8), 607-613. doi:10.1016/j.envsci.2006.07.006
- Israel, D., & Briones, R. (2014). *Disasters, poverty, and coping strategies: The framework and empirical evidence from micro/household data - Philippine case* (PIDS Discussion Paper No. 2014-06). Manila, Philippines: Philippine Institute for Development Studies Publisher.
- Iuchi, K., & Esnard, A. M. (2008). Earthquake impact mitigation in poor urban areas: The case of Metropolitan Manila. *Disaster Prevention and Management*, 17(4), 454-469. doi:10.1108/09653560810901700
- Iwata, K., Ito, Y., & Managi, S. (2014). Public and private mitigation for natural disasters in Japan. *International Journal of Disaster Risk Reduction*, 7, 39-50. <http://dx.doi.org/10.1016/j.ijdr.2013.12.005>
- Kabiling, G. (2014, August 2). Ping submits P170.9-B 'Yolanda' rehab plan. *Manila Bulletin*. Retrieved from <http://www.mb.com.ph/ping-submits-p170-9-b-yolanda-rehab-plan/>
- Kennedy, J., Ashmore, J., Babister, E., & Kelman, I. (2008). The meaning of 'build back better': Evidence from post-Tsunami Aceh and Sri Lanka. *Journal of Contingencies and Crisis Management*, 16(1), 24-36.
- Kim, J., Han, D., & Na, J. (2006). The Solar City Daegu 2050 project: Visions for a sustainable city. *Bulletin of Science, Technology, and Society*, 26, 96-104. doi:10.1177/0270467606287787
- Larkin, J. (2014, May). From Aceh to Tacloban: How far have we come? *Development Asia*, , 8-16.
- Li, H. (2003). Management of coastal mega-cities—a new challenge in the 21st century. *Marine Policy*, 27(4), 333-337. doi:10.1016/S0308-597X(03)00045-9
- Luna, E. (2001). Disaster mitigation and preparedness: The case of NGOs in the Philippines. *Disasters*, 25(3), 216-226.
- Malick, B., Rahaman, K.R., & Vogt, J. (2011). Social vulnerability analysis for sustainable disaster mitigation planning in coastal Bangladesh. *Disaster Prevention and Management*, 20(3), 220-237. doi:10.1108/09653561111141682
- Malig, J. (2013, November 18). Why no one died in Cebu. *ABS-CBN News*. Retrieved from <http://www.abs-cbnnews.com/nation/11/18/13/why-no-one-died-cebu-island>
- Manyena, S., O'Brien, G., O'Keefe, P., & Rose, J. (2011). Disaster resilience: A bounce back or bounce forward ability? *Local Environment*, 16, 417-424. doi:10.1080/13549839.2011.583049
- Marcelo, E. (2014, November 8 Month day). How government will spend P167.86B for Yolanda rehabilitation. *GMA Network*. Retrieved from <http://www.gmanetwork.com/news/story/387222/news/nation/how-government-will-spend-p167-86b-for-yolanda-rehabilitation>
- Matsuoka, Y., & Shawb, R. (2012). Improvements and challenges of Japanese disaster management system. *Asian Journal of Environment and Disaster Management*, 4(2), 1-26. doi:10.3850/S1793924012001101
- National Disaster Risk Reduction & Management Council [NDRRMC]. (2014). *Update re the effects of typhoon Yolanda (Haiyan)*. Retrieved from <http://www.ndrrmc.gov.ph/attachments/article/1177/Update%20Effects%20TY%20YOLANDA%2017%20April%202014.pdf>
- National Disaster Risk Reduction and Management Plan* [NDRRMP]. (2011). Retrieved from http://www.dilg.gov.ph/PDF_File/resources/DILG-Resources-2012116-420ac59e31.pdf
- National Economic and Development Authority [NEDA]. (2013). *Reconstruction assistance on Yolanda: Build back better*. Pasig, Manila: Author.
- National Economic and Development Authority [NEDA]. (2014). *Reconstruction assistance on Yolanda: Implementation for results*. Pasig, Manila.
- Newman, P. (2008). The environmental impact of cities. *Environment and Urbanization*, 18(2#), 275-295. doi: 10.1177/0956247806D0o6w9n5lo9ad9ed
- Natural Hazards Research and Applications Information Center [NHRAIC]. (2001). *Holistic disaster recovery: Ideas for building local sustainability after a natural disaster*. University of Colorado, Colorado, USA.
- Official Gazette. (2013). *Memorandum Order No. 62: Providing for the functions of the Presidential Assistant for rehabilitation and recovery*. Retrieved from <http://www.gov.ph/2013/12/06/memorandum-order-no-62-s-2013/>

- Office of the President. (2013, November 7 Month day). *President Aquino appeals for cooperation to minimize impact of 'Typhoon Yolanda'*. Retrieved from <http://president.gov.ph/news/president-aquino-appeals-for-cooperation-to-minimize-impact-of-typhoon-yolanda/>
- Office of the Presidential Assistant for Recovery and Rehabilitation [OPARR]. (2014a). *Yolanda rehabilitation and recovery efforts* (Consolidated report as of July 28, 2014). Retrieved from <http://president.gov.ph/wp-content/uploads/2014/08/Revised-DraftYolanda-Rehab-Briefer-as-of-1-Aug-2014-w-status-report.pdf>
- . (2014b). *Yolanda Comprehensive Rehabilitation and Recovery Plan*. Manila, Philippines.
- Panda, R. (2012). Japan's disaster response management: Lessons for the world. *Journal of Defence Studies*, 6(1), 59-76.
- Pasteur, K. (2011). *From vulnerability to resilience: A framework for analysis and action to build community resilience*. U.K.: Practical Action Publishing Ltd.
- Peñalba, L., Elazegui, D., Pulhin, J., & Cruz, R. V. (2012). Social and institutional dimensions of climate change adaptation. *International Journal of Climate Change Strategies and Management*, 4(3), 308-322. doi:0.1108/17568691211248748
- Rasoolimanesh, S. M., Badarulzaman, N., & Jaafar, M. (2012). City development strategies (CDS) and sustainable urbanization in developing world. *Procedia – Social and Behavioral Science*, 36, 623 – 631. doi: 10.1016/j.sbspro.2012.03.068
- Recuenco, A. (2014, October 30Month day). New township to rise from the ashes of destruction. *Manila Bulletin*. Retrieved from <http://www.mb.com.ph/new-township-to-rise-from-the-ashes-of-destruction/An-act-strengthening-the-Philippine-disaster-risk-reduction-and-management-system-providing-for-the-national-disaster-risk-reduction-and-management-framework-and-institutionalizing-the-national-disaster-risk-reduction-and-management-plan-appropriating-funds-therefore-and-for-other-purposes>, Republic Act 10121 (2009).
- Salaverria, L. (2014, December 22). Lacson quits as "Yolanda" czar. *Philippine Daily Inquirer*. Retrieved from <http://newsinfo.inquirer.net/658520/lacson-quits-as-yolanda-czar>
- Santos, J. B. (2014, November 10Month day). Foreign donors to have open access in new Yolanda online aid tracker. *Interaksyon*. Retrieved from <http://www.interaksyon.com/article/98921/foreign-donors-to-have-open-access-in-new-yolanda-online-aid-tracker>
- Sekovski, I., Newton, A., & Dennison, W. (2012). Megacities in the coastal zone: Using a driver-pressure-state-impact-response framework to address complex environmental problems. *Estuarine, Coastal and Shelf Science*, 96, 48-59. doi:10.1016/j.ecss.2011.07.011
- Stratmann, B. (2011). Megacities: Globalization, metropolization, and sustainability. *Journal of Developing Societies*, 27(3-4), 229–259. doi:10.1177/0169796X1102700402
- Sudmeier-Rieux, K. (2014). Resilience – an emerging paradigm of danger or of hope? *Disaster Prevention and Management*, 23, 67-80.
- Thomas, V., Albert, J. R., & Perez, R. (2013). *Climate-related disasters in Asia and the Pacific* (Working Paper Series No. 358). Mandaluyong, Philippines Location: ADB Economics.
- Thomas, V., Albert, J. R., & Hepburn, C. (2014). Contributors to the frequency of intense climate disasters in Asia-Pacific countries. *Climatic Change*, 126(3-4), 381-398. doi: 10.1007/s10584-014-1232-y
- Tupaz, V. (2014, November 11). Malacañang's Yolanda aid dilemma: Speed or procedure? *Rappler*. Retrieved from <http://www.rappler.com/newsbreak/in-depth/74644-speed-procedure-malacanang-yolanda-aid-dilemma>
- Tweed, F., & Walker, G. (2011). Some lessons for resilience from the 2011 multi-disaster in Japan. *Local Environment*, 16(9), 937–942. <http://dx.doi.org/10.1080/13549839.2011.617949>
- United Nations Environment Programme & SKAT. (2007). *After the tsunami: Sustainable building guidelines for South-East Asia*. Kenya: United Nations Environment Programme.
- United Nations Human Settlements Programme. (2011). *Cities and climate change: Global report on human settlements 2011*. London: Author.
- United States Agency for International Development [USAID]. (2014). *Philippines–Typhoon Yolanda/Haiyan fact sheet 22*. Retrieved from http://www.usaid.gov/sites/default/files/documents/1866/philippines_ty_fs22_04-21-2014.pdf

- Victoria, L. (2002). *Community based disaster management in the Philippines: Making a difference in people's lives*. Retrieved from http://www.preventionweb.net/files/733_8363.pdf
- World Bank. (2010). *Climate risks and adaptation in Asian coastal megacities: A synthesis report*. Washington D.C., USA: Author.
- . (2012). *Inclusive green growth: The pathway to sustainable development*. Washington D.C., USA: World Bank.
- . (2014). *Pursuing inclusive growth through sustainable reconstruction and job creation*. Washington D.C., USA: World Bank.
- Xue, C., Wang, Y., & Tsai, L. (2013). Building new towns in China – A case study of Zhengdong New District. *Cities*, 30, 223–232. doi:10.1016/j.cities.2012.02.003
- Yeung, Y. (2001). Coastal mega-cities in Asia: Transformation, sustainability and management. *Ocean and Coastal Management*, 44(5-6), 319-333.