



Building Back Better After Disasters: Enhancing Community Resilience Through In-City Resettlement in Valenzuela City, Philippines

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Abstract

Build Back Better (BBB) is an integral concept in the Sendai Framework for Disaster Risk Reduction that aims to enhance the resilience of disaster-affected communities. This is crucial for developing countries such as the Philippines, the most at-risk country in the 2022 World Risk Index. To better understand microlevel BBB application in view of limited studies, this case study analyzed the resilience of disaster-affected households relocated to an in-city resettlement project using the community resilience framework of the International Federation of the Red Cross and Red Crescent Societies. A mixed methods research design was utilized, and quantitative and qualitative data from key informant interviews, household surveys, project documents, and observation were analyzed and triangulated. Results show that relocation significantly improved resilience in terms of knowledge, health, infrastructure and services, connectedness, organization, and economic opportunities. These were achieved through good practices conforming to BBB principles such as in-city resettlement modality, utilization of social technologies, and institutional arrangements that foster participatory management and multistakeholder engagement; however, psychological support needs to be improved and mechanisms to manage natural assets devised in view of spatial limitations. Results indicate positive contributions of local government-managed in-city resettlement to community resilience in a developing country context when BBB principles are considered. Stakeholders in disaster governance can gain useful insights from the study amid trends toward local government-led resettlement.

Keywords: Build Back Better, disaster governance, in-city resettlement, local government, relocation, resilience

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Highlights

- In-city resettlement increased resilience of relocated households based on the community resilience framework of the International Federation of the Red Cross (IFRC)
- Resilience indicators in terms of knowledge, health, infrastructure and services, organization, livelihoods, and connectedness significantly improved
- In-city resettlement modality facilitates delivery of social services and reduces social and livelihood risks
- Multi-stakeholder engagement, participatory management through social technologies, and in-city resettlement modality contribute to building back better

Introduction

Rapid urbanization coupled with increasing climate risks impede the world's move toward safe, resilient, and sustainable cities and communities, as embodied in Sustainable Development Goal (SDG) 11 of the United Nations' (UN) 2030 Agenda. Without appropriate policies and interventions, poorly planned urban growth leads to adverse economic, social, and environmental impacts, including pollution, housing shortages, unequal access to services and infrastructure, and food and energy insecurity (Baker & Gadgil, 2017; Hijioka *et al.*, 2014; United Nations Department of Economic and Social Affairs [UN DESA], 2017; World Bank [WB], 2017). A more evident consequence is urban growth in hazard-prone areas through informal settlements (UN, 2014), increasing the population's vulnerability to disasters.

Resettlement Issues and Imperatives to Build Back Better

With the projected increase in frequency and magnitude of natural hazards amid climate change (Intergovernmental Panel on Climate Change [IPCC], 2022), planned relocation is a last resort strategy that can be used for disaster risk reduction (Lauer *et al.*, 2021; Nalau & Handmer, 2018; United Nations High Commissioner for Refugees [UNHCR], 2014) and climate change adaptation strategies as managed retreat (Doberstein *et al.*, 2020; Tadgell *et al.*, 2017). In developing countries, post-disaster resettlement for recovery is common, and preventive resettlement of families living in high-risk areas is urgently needed (Correa *et al.*, 2011). By the 2040s, resettlement of informal urban settlers is expected to be more frequent in the Pacific region (Campbell *et al.*, 2005), the most rapidly urbanizing region with half of the world's megacities (Baker & Gadgil, 2017; UN DESA, 2019).

Post-disaster relocation and the effectiveness of resettlement initiatives, however, need to be improved in terms of reducing disaster risks and considering the needs, livelihoods, and preferences of relocated individuals (Ajibade, 2022; Bodine *et al.*, 2022; Mannakkara & Wilkinson, 2014). Questions on whose reality counts and whether disaster shelters respond to local needs as defined by affected individuals have been noted in an assessment of 40 years of disaster shelter experience (Davis, 2011). Vanclay (2017) noted that relocated communities are often moved to areas far from their source of living, causing difficulties in adapting to the new area, as in the case of relocated communities in Albay, Philippines, who lost their livelihood options (Usamah & Haynes, 2012). In other cases, relocated individuals were removed from exposure to previous hazards but increased their exposure to other hazards, such as flooding, in the case of the relocated tsunami-affected communities in Sri Lanka (Manatunge & Abeysinghe, 2017) and Typhoon Haiyan-affected households in the Philippines (Bodine *et al.*, 2022). Other concerns regarding urban resettlement strategies pertain to location since it affects social acceptability and outcomes (Doberstein *et al.*, 2019; Lauer *et al.*, 2021).

There is thus a need to develop post-disaster recovery initiatives that make communities more resilient and "Build Back Better" (BBB) (Mannakkara *et al.*, 2014; United Nations International Strategy for Disaster Reduction [UNISDR], 2017). Building resilience is effective since it addresses short-term and long-term risks (Asian Development Bank [ADB], 2022). BBB is defined by the UN (UNISDR, 2017) as a post-disaster recovery approach that increases resilience by "integrating disaster risk reduction measures into the restoration of physical infrastructure and societal systems and into the revitalization of livelihoods, economies, and the environment". Following a holistic resilience perspective and based on practical community experiences with recent disasters, the Community Resilience Framework of the International Federation of the Red Cross and Red Crescent Societies (IFRC) is a useful tool to analyze on-the-ground applications of BBB.

Philippine Disaster Risk Context and Resettlement Challenges

The Philippines, ranked as the most disaster-prone country in the 2022 World Risk Index (Atwii *et al.*, 2022) and projected to have 62% of its population in urban areas by 2050 (ADB, 2022), urgently needs to enhance urban poor resilience and post-disaster recovery toward BBB (IIED, Karaos, & Gregorio, 2022). The Philippine Development Plan (PDP) 2011–2016 estimates that there are 1.5 million informal settler families (ISFs) in the country, many of which reside in danger zones or marginal areas (ADB, 2022; National Economic and Development Authority [NEDA], 2011). The National

Capital Region (NCR), or Metro Manila, the country's capital and most urbanized area, is highly vulnerable to various climate risks. As of 2018, more than 600,000 informal settlers are disproportionately affected and are among the most vulnerable (Navarro *et al.*, 2021).

Resettlement initiatives have long been implemented in the NCR. Established in 2007, the Metro Manila Inter-Agency Committee on Informal Settlers conducted a study in 2009 that led to a 10-year plan to relocate informal settlers, relying largely on large-scale off-city resettlement (Valeriano, 2012). Meanwhile, the PDP 2017–2022 aimed to relocate around 104,000 ISFs in Metro Manila living in dangerous areas (NEDA, 2017). The country has recently refurbished its informal settlement upgrading strategy founded on resilience through local government-led and community-driven strategic planning and implementation of the Philippine National Urban Development and Housing Framework 2017–2022.

Resettlement as part of post-disaster recovery was highlighted in 2009. One of the worst natural disasters to hit the country in recent years was the massive flooding caused by Typhoon Ketsana (Philippine name: Ondoy), immediately followed by Typhoon Parma (Philippine name: Pepeng), which made landfall in the NCR in 2009 (Abon *et al.*, 2011; Sato & Nakasu, 2011). The post-disaster and needs assessment estimated total damage at \$4.383 million, comparable to other major global disasters and accounting for 2.7% of the gross domestic product (WB, 2011). Metro Manila, including Valenzuela City, was among the most devastated due to extensive flooding. In the aftermath, the local government unit (LGU) of Valenzuela City established Disiplina Village Ugong (DVU), considered the first LGU-initiated housing project post-Typhoon Ketsana in the Philippines.

Being one of the first LGU-initiated in-city resettlement projects in the country, DVU presents a useful case to study to better understand the microlevel application of BBB in the context of developing countries. The project has been recognized by several sectors because of its positive results and was called the Complete In-City Housing Package for Disaster Preparedness and Resiliency. Analyzing this project would provide empirical findings on practices that can promote resilience in in-city resettlement for disaster recovery. This is significant considering the Philippine House of Representatives' approval in November 2022 of a bill that mandates the establishment and prioritization of on-site, in-city, or near-city relocation programs for informal settlers in urban areas by all LGUs (Reganit, 2022). Globally, disaster management has moved toward decentralization and local governments.

Thus, this case study aimed to contribute to understanding the changes in the resilience of resettled households and practices that contribute to improving resilience

in the context of BBB. Specifically, the study assessed the resilience of relocated households before and after relocation, determined the significant changes, and analyzed the good practices of in-city resettlement within the BBB concept. The analysis can provide guidance to disaster management stakeholders in improving planned resettlement and building back better. Overall, insights from the study can contribute to initiatives to achieve SDG 11 on sustainable cities and communities and SDG 13 on climate action.

Methods

Research Design

The researchers employed a mixed methods research design that has been increasingly used in environmental management and sustainable development, including disaster research, to better integrate and enrich research findings (Molina-Azorin & Lopez-Gamero, 2014). Quantitative and qualitative data were gathered through a household survey. The survey results were complemented by qualitative data from key informant interviews (KIIs) to enrich the project description and survey findings. Field observation and secondary data were also utilized to further validate the perceptions of key informants and survey respondents and provide a deeper understanding of the relocation project. Triangulation of data was done to integrate data analysis.

Data Collection and Analysis

The sample size for the household survey was computed using Cochran's formula, yielding 87 household respondents selected through proportionate stratified random sampling. A semistructured questionnaire in Filipino was pretested and subjected to minor revisions to improve the clarity of the questions before being used. The questionnaire was composed of three main sections: (1) sociodemographic profile; (2) level of resilience before and after relocation; and (3) good practices of the project. For the level of resilience, questions were based on variables developed from the IFRC's community resilience framework (Figure 1), which has six components: (1) knowledge; (2) health; (3) infrastructure and services; (4) connectedness; (5) organization; and (6) economic opportunities. Respondents were asked to recall and rate their perceived condition before and after relocation for each variable using either a binary scale (presence or absence of services, etc.) or a Likert scale (1–5, with 1 being very low and 5 being very high for questions pertaining to quality). This was valid since the values were not integrated into a single resilience index. Open-ended follow-up questions were also asked to justify answers and describe problems, issues, or other concerns. Data were subjected to descriptive statistical analysis (frequency, percentage, and median), while significant changes were determined using the McNemar's test (where a p -value of <0.0001 indicates

very little evidence that there is a significant change).

KIIs were conducted with three community leaders, the head engineer of the Housing and Resettlement Office (HRO) of Valenzuela City, and the Gawad Kalinga (GK) Community Development Foundation to collect qualitative data. A KII guide composed of seven major open-ended questions based on the IFRC framework was used. The HRO was also asked further about the background of the relocation project. The data were subjected to thematic analysis to understand DVU operations in relation to BBB.

The good practices were determined through the triangulation of data in accordance with the BBB framework of Mannakkara and Wilkinson (2014). This holistic framework classifies the BBB principles into three recovery areas: risk reduction, community recovery, and implementation.

Results and Discussion

Study Area

Valenzuela City is a highly urbanized city composed of high-density commercial, residential, and industrial establishments in 33 barangays (the village level or smallest political unit in the Philippines) (Cities Development Initiative for Asia [CDIA], 2014). It has

a land area of 4,459.4 ha and is the 13th most populous city in the Philippines, with a population of 620,422 individuals based on the 2015 Philippine Census (Co *et al.*, 2020). The city is one of the most flood-prone areas in Metro Manila due to frequent exposure to typhoons, topography whereby around 25% of the city is below sea level, thereby limiting natural drainage systems, location near the coastal area, and receiving water runoff from several rivers (CDIA, 2014; Co *et al.*, 2020).

The case studied was DVU in Valenzuela City, an LGU-initiated and managed in-city resettlement area. It has a land area of 1.921 ha and 39 housing buildings composed of 892 individual housing units. Originally intended to serve as housing units for local government employees, the resettlement area was constructed from 2011 to 2015 through partnerships between the LGU and the GK, the Dakilang Handog Foundation, the National Housing Authority (NHA), and some private institutions. It was eventually necessary to relocate displaced households following Typhoon Ketsana and individuals in high-risk areas, including informal settlers along the waterways of Valenzuela City. According to the HRO of Valenzuela City, DVU consists of 892 households. DVU has a daycare center, a health center, a basketball court, and a multipurpose hall. A unique component of the project is the Home Space Agreement (HSA), which lays down a set of rules and regulations for the beneficiaries to instill discipline toward a long-term, disaster-resilient community.

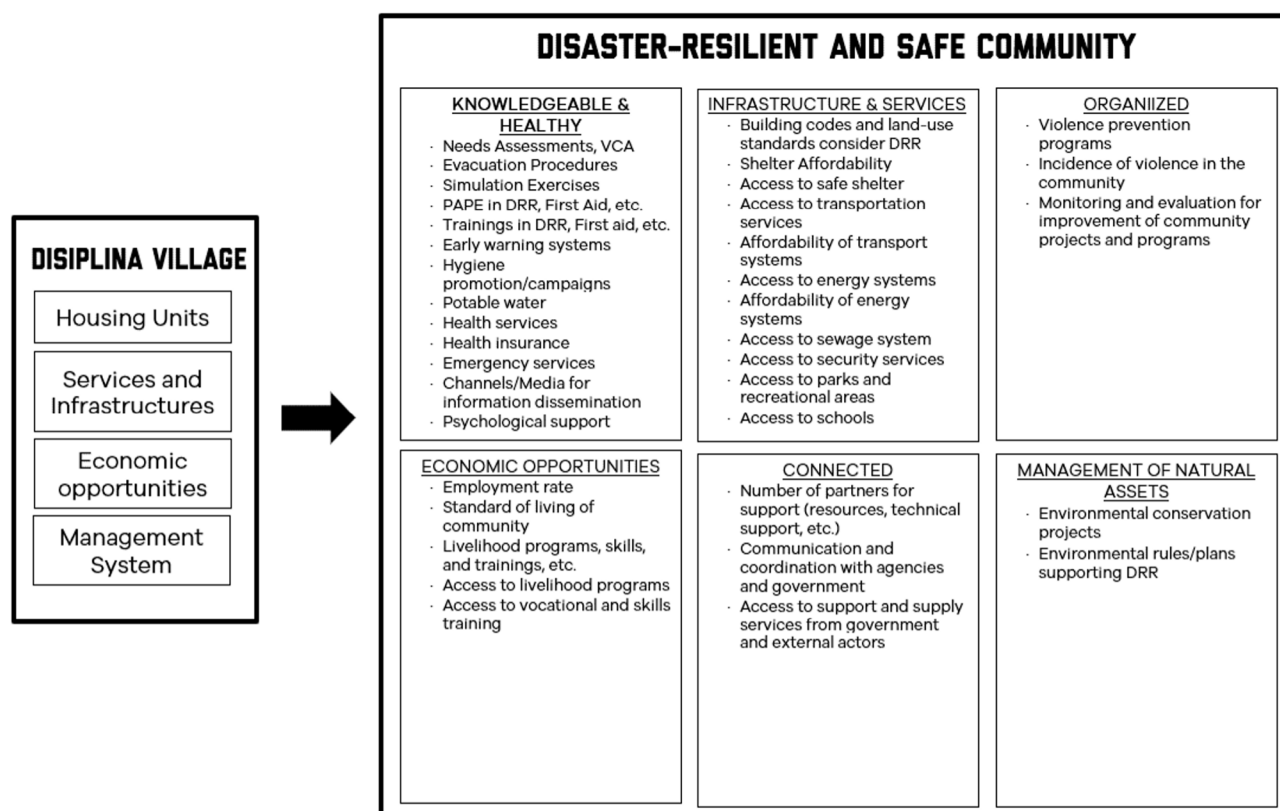


Figure 1. Conceptual framework of the study (adapted from IFRC 2014)

Sociodemographic Characteristics of Respondents

The household respondents of the survey were mostly female (85.06%), married (68.97%), Catholics (79.31%), and middle-aged adults (56.32%). The household survey was mostly conducted during regular working days and hours, which could be a factor in the predominance of female respondents. The respondents were predominantly high school graduates (35.63%), earn PHP 5,001–10,000 monthly (36.78%), and belong to a family of 5 (22.99%), with 2 earning family members (44.83%). The most prevalent main sources of income included factory workers, employees, vendors, and helpers.

Significant Changes and Findings Toward Enhancing Resilience Through In-City Resettlement

Based on McNemar's test, there were significant changes in the following variables after relocation: 8 out of 10 knowledge and health variables; 8 out of 10 infrastructure and services variables; all 4 economic opportunities variables; 2 out of 3 connectedness variables; and all 3 organization/social cohesion variables (Figure 2).

The knowledge and capacity of resettled households related to disasters significantly increased in terms of access to and availability of health-related services and capacity-building activities (disaster preparedness, first aid, fire prevention and response, and building safety).

The households also had emergency simulation exercises conducted almost quarterly in DVU. Moreover, they had more access to hygiene campaigns through additional sources of information, such as block or building leaders and the HOA. Health services became more accessible because a health center that provides free services was put up inside DVU. Potable water, a sewage system, government health insurance, and emergency services were more accessible at the relocation site. Several scientific papers have emphasized the importance of increased knowledge and capacity in building disaster resilience. Bodine *et al.* (2022) noted that this contributes to disaster preparedness in the face of continuing risks. Access to basic services related to health is also important in reducing vulnerability and underlying risk factors for disasters (Correa *et al.*, 2011).

Resettlement also involves equipping communities vulnerable to various disasters with a better and more secure environment and living conditions (Sridarran *et al.*, 2018). Specifically, the reconstruction of physical infrastructure is an important part of the social recovery process (Yusoff & Yusoff, 2021). In the case of DVU, infrastructure and services were found to have improved significantly. The safety and quality of housing improved from being composed of light materials (wood, etc.) prior to relocation to housing units made of more durable materials (cement, concrete, etc.) and abiding by the Philippine Building Code in the relocation area. There was also an increase in housing affordability since

Knowledge and Health	Infrastructure and Services	Economic Opportunities	Connectedness	Organization/ Social Cohesion
• Conduct of simulation exercises • Availability of trainings on risk reduction, first aid, safe shelter • Availability of hygiene campaigns and promotions • Availability of health services • Access to health services • Access to sewage systems • Access to health insurance • Access to emergency services during disasters	• Access to safe shelter • Affordability of shelter • Affordability of transport systems • Access to energy systems • Affordability of energy systems • Access to security services • Availability of garbage collection services • Availability of parks and recreational area	• Availability of livelihood programs/projects • Access to livelihood programs • Access to various jobs/livelihood opportunities • Income Sufficiency	• Availability of support and supply services from the government • Availability of proper communication and coordination systems with government officials and agencies	• Availability of violence prevention programs/initiatives • Presence of violence incidences in the community • Frequency of violence incidences in the community

Figure 2. Resilience variables with significant changes after relocation based on McNemar's test

DVU enforces a rental system at PHP 300 per month (US\$1 = PHP 57 as of November 2022). However, while this was an improvement for those previously renting, those who owned their house before relocation lost full ownership rights. Resettled households were awarded certificates of occupancy (COs), allowing them to reside in their designated housing units for as long as they comply with the rules set forth by the LGU.

Basic services were also found to have significantly improved after the relocation. The transportation costs of resettled households were lower at the relocation site due to the better accessibility of DVU to livelihood sources and other services such as the school or health center (an elementary school and health center inside DVU). The resettled households also had greater access to electricity, which became more affordable since they had their own electric meter compared to previously having shared electrical connections with high charges. In addition, security in the community was significantly better at the relocation site due to several security forces in the community, including volunteers and community leaders. Respondents mentioned that the community was more organized and cohesive because of these security measures.

Moreover, cleanliness significantly improved due to the presence of regular garbage collection services at the relocation site. Some respondents said that before relocation, they observed that some community members resorted to disposing of garbage in nearby bodies of water, vacant lots, or burning their trash due to a lack of garbage collection services. In addition, improvements in the availability and quality of recreational facilities in or near the relocation area (constructed covered courts for recreation, etc.) were also significant.

Basic services are one of the key aspects that must be immediately restored, followed by the recovery of lost assets (Hallegatte *et al.*, 2018). Public services and utilities support the delivery of basic needs. Studies have shown that these are often neglected in relocation programs (Ajibade, 2019; Usamah *et al.*, 2014), including in the Philippines (Velasco, 2016). By providing basic services and utilities in DVU, the relocation project was able to address the key needs of the resettled households, which are important for disaster risk reduction.

Restoring economic well-being is also important in the social recovery process (Yusoff & Yusoff, 2021), but studies have shown that economic recovery is often neglected in resettlement. An assessment of resettlement action plans by the government in the Philippines (Ballesteros & Egana, 2013) found that these often focus on providing housing units and fail to consider aspects such as livelihood and social networks. The case of DVU runs counter to this trend since there has been a significant increase in the availability of livelihood options. Diverse livelihood programs were implemented through the LGU and other stakeholders through training (e.g., tofu

making, garment making, and meat processing) and livelihood packages (e.g., rice retail stores). Moreover, there was a significant change in the availability of economic opportunities near the community since commercial areas are nearby. Last, there was also a significant increase in income sufficiency, which can be related to improvements in livelihood opportunities and other aspects (e.g., housing affordability). The provision of livelihood opportunities contributes to building the internal capacities as well as improving the quality of life of resettled households, which is deemed important for post-disaster long-term reconstruction (Mohd *et al.*, 2017).

In the aspect of connectedness, a significant increase in the availability of government support was observed. The LGU partnered with various government agencies to provide services, projects, and financial assistance. A multiagency assistance workplan called Resettlement Governance Assistance Fund (RGAF) encompassing activities and plans in different areas (e.g., construction of a two-story evacuation center and provision of seed capital for business proposals) was also established. In addition, the availability of proper communication and coordination systems with government agencies also changed significantly through the establishment of the HOA, community leaders, and block leaders.

For organizations, there was a significant change in the presence of peace and order initiatives after relocation. Aside from security services in the community, the rules and regulations contributed to keeping community order, while mid-year and year-end assessments helped ensure that residents comply with obligations. The LGU devised an HSA that binds the beneficiaries to the policies (e.g., caring for the units, good relations with neighbors, and compliance with obligations such as leases and utility bills) and subjects them to eviction guidelines. There was a significant decrease in the frequency of incidences of violence, and the organization and cohesion of the community significantly improved.

A summary of the significant changes (Figure 3) highlights that only one aspect declined after relocation: ownership of the house. Hallegatte *et al.* (2018) emphasize that resilient recovery within BBB is achieved through three phases of post-disaster recovery: humanitarian relief, restoration of basic services, and reconstruction and recovery of assets. In the case of DVU, these were incorporated into planning and decision-making, thereby addressing the long-term and multidimensional nature of resettlement.

Good Practices in In-City Resettlement Toward BBB

Good practices were found in three aspects of BBB for disaster recovery based on the framework of Mannakkara and Wilkinson (2014): (1) risk reduction; (2) community recovery; and (3) implementation.

RESILIENCE CHARACTERISTICS		DIRECTION OF CHANGE AND SIGNIFICANT CHANGES AFTER RELOCATION	
Knowledge and Health	- Disaster preparedness activities, training, DRR knowledge - Health & hygiene campaigns & services	↑	Regular emergency drills & DRR training
		↑	Fire truck and ambulance within community
		↑	Health center inside the community, access to government health insurance
		↑	Sewage and sanitation system in place
Infrastructure and Services	- House ownership - Structural safety & quality of housing - Transportation & electricity affordability - Security services - Accessibility & quality of recreation facilities	↓	Declined for some, from owned to Certificate of Occupancy
		↑	Improved quality from light to more durable construction materials and structural design following building code
		↑	More affordable transportation due to accessibility & lower electricity costs (own meter)
		↑	Improved quality of security services
		↑	More accessible & better quality of recreational services
Economic Opportunities	- Livelihood programs and opportunities - Income sufficiency	↑	More livelihood programs/ projects and training & increased community participation
		↑	Improved income sufficiency
Connectedness & Organization	- Government support - Communication system with government - Community peace and order	↑	More government support available to community
		↑	Improved communication system through additional channels (HOA, block leaders, etc.)
		↑	Improved peace & order situation due to less frequent incidences of violence (theft, personal family conflicts)

Figure 3. Summary description of significant changes in community resilience characteristics before and after relocation to DVU

Risk Reduction Through Structural and Nonstructural Measures

For the first BBB recovery area, an appropriate combination of structural and nonstructural measures to reduce risks was implemented in DVU. First, structural safety and quality of housing units were ensured in accordance with regulatory policies (National Building Code of the Philippines, Batas Pambansa [BP] 220, building permits). The National Building Code provides minimum standards and requirements to regulate structures in terms of location, design, site, quality of materials, construction, use, occupancy, and maintenance, while BP 220 sets the minimum

design standards and technical requirements on the levels of safety, health, and ecological consideration for socialized housing projects. Structural design is an important consideration for a successful relocation. Usamah and Haynes (2012), in a study of resettlement after the eruption of Mayon volcano in Southern Luzon, Philippines, found that house design and availability of “public and lifeline facilities” must be considered for successful relocation. Similarly, Satterthwaite *et al.* (2020) highlighted hazard-proof housing as an action to reduce hazards and exposure toward building resilience.

Second, appropriate site selection in consideration of land use planning and the economic situation reduces hazard

risks and social and livelihood risks (e.g., loss of sense of place and loss of livelihood). DVU was constructed in a residential area based on the city's land-use classification and was located on an economically favorable site. According to key informants, the major consideration of the local government was to relocate the community far from hazard- and risk-prone areas to (1) remove the risks and vulnerabilities of the community and prevent the devastation of families when calamities occur and (2) avoid recurring expenses for the local government when disasters occur. Site selection has been emphasized as an important aspect that requires adequate attention to ensure sustainable, planned relocation (UNHCR, 2014). Risk-sensitive land use planning contributes to reducing exposure, thereby enhancing resilience (Satterthwaite *et al.*, 2020). Based on the Hyogo Framework of Action (HFA), land use planning is one of the ways to meet Priority for Action No. 4 on reducing the underlying disaster risk factors (Correa *et al.*, 2011).

Last, management of natural assets was enhanced through environmental protection activities such as tree planting and plans for a hanging garden. While the activities were found to be lacking due largely to spatial limitations, there were plans to develop environmental enhancement projects such as strengthening waste segregation and the establishment of mini gardens.

Community Recovery Through In-City Resettlement Modality and Social Technologies

For community recovery, improving the economic climate of the community through livelihood regeneration is important in the BBB concept (Mannakkara & Wilkinson, 2014). In DVU, this was achieved with in-city resettlement. Livelihood risks were reduced through the availability of economic opportunities in the vicinity of DVU and livelihood projects inside DVU. This allowed income diversification options, which are deemed important in the HFA (Correa *et al.*, 2011). Financial support for projects was also ensured through the RGAF. The survey results show that livelihood is one of the aspects of living that improved the most after relocation.

The in-city modality also allowed for easier provision of social services by the LGU. The Valenzuela City LGU perceived in-city resettlement as more beneficial for both the resettled households and the city government compared to off-city resettlement because (1) in-city resettlement allowed the LGU to have jurisdiction over the relocated, and (2) relocating the victims outside the city would affect them economically by displacing them away from their livelihoods.

The benefits of in-city resettlement identified were in consonance with the findings of Ballesteros and Egana (2013) that this modality increases the participation of the LGU in terms of identification and selection of sites,

identification and tagging of beneficiaries, and provision of social services. In the same study, they noted that off-city relocation resulted in declining income sufficiency due to a lack of livelihood or employment opportunities and the inaccessibility of infrastructure.

Previous resettlement policies in the country have received criticism because informal settlers were forced to resettle without undergoing a proper transition process, and integration support was not provided (Gilles, 2012). This was addressed through another good practice in the case of DVU: the use of several social technologies in all stages of the resettlement project cycle. Social technology (ST) pertains to the application of knowledge and techniques drawn from social science theories and concepts to address practical problems (Liedtka, 2020). ST thus includes capacity-building processes, instruments such as policies, community engagement techniques (participatory and multistakeholder approaches), and social science-based research methods (community profiling and needs assessment, etc.). Prior to the construction of DVU, consultations were conducted with the households regarding their needs, and target beneficiaries had site visits and orientations. The concept of "bayanihan" (collective labor) and participation was fostered in beneficiaries by requiring them to render 500 hr as their sweat equity in the construction of the buildings. Seminars, training, and workshops on leadership, value formation, gender sensitivity, social relations, community development planning, and parent effectiveness were provided by the LGU, government, and civil society groups. Case studies and needs assessments were conducted by the City Social Welfare and Development Office. Several social services were available in DVU to meet the identified needs, and based on survey results, these were sufficient and complete. The households are also organized into HOAs with leaders.

Community participation achieved in the case of DVU is an important requirement of post-disaster needs assessment (Jeggle and Bogero, 2018; Mohd *et al.*, 2017; Tadgel *et al.*, 2017) to guide planning for recovery. Meaningful community participation and empowerment, consultative decision-making, and consent mechanisms have been shown to contribute to relocation sustainability and success and informal settlement upgrading (Nassar & Elsayed, 2018; UNHCR, 2014; Usamah & Haynes, 2012). Such consultation includes the host communities, and in the case of DVU, the in-city modality hastens this aspect. As noted in a study by Nassar and Elsayed (2018) on urban resettlement in Egypt, the identification of local needs and demands and organizing the community are essential in the long-term sustainable development process.

The multipartnership model utilized in DVU is also a good practice in community recovery. This was embodied in the multistakeholder DVU Management Council, composed of all stakeholders in the project, such as GK,

NHA, the different departments of the LGU, and the HOAs. Monthly meetings were conducted to discuss and address operational matters. The engagement of multiple stakeholders allowed ample support (resources, funding, skills, etc.) for social recovery in DVU. As noted by Yusoff and Yusoff (2021), social recovery is important in disaster management and requires physical infrastructure reconstruction and the restoration of community well-being in the emotional, economic, and social aspects. As a form of collective action, multistakeholder engagement fosters successful recovery (Santiago *et al.*, 2017). This is also recommended in the conduct of resettlement as a managed retreat (Tadgell *et al.*, 2017).

Moreover, proper controls through legislation and regulation were present in DVU, another element required for communities to BBB (Mannakkara and Wilkinson, 2014). As noted by Mannakkara *et al.* (2014), an effective and efficient recovery process involves appropriate disaster legislation and regulation.

Implementation Through Effective Management of Multiple Stakeholders

In the last recovery area, good management of stakeholders during implementation was noted in DVU. Stakeholders had clear and specific roles in the proper implementation of site operations. Policies and regulations guide post-disaster activities related to DVU. The local government ensured an immediate response to the disaster caused by Typhoon Ketsana in compliance with the National Disaster Risk Reduction and Management Plan. The Valenzuela City Disaster Risk Reduction and Management Office has led post-disaster activities, including the development of a strategic action plan that supports DRR.

Gaps and Potential Opportunities for Improvement

Aside from the good practices, the triangulation of results also revealed several limitations and potential opportunities for improvement for post-disaster resettlement.

Further Enhancement of Social Cohesion and Emotional Well-Being Through Social Technologies

While in-city resettlement helps reduce issues of community integration, deemed important factors in the sustainability of resettlement (UNHCR, 2014), these areas are still a mix of cultures, and attention should be given to building social cohesion. Theft and personal family conflicts were among the common incidences of violence still observed in DVU. Continued use of social technologies can contribute to addressing this aspect and can help facilitate community-driven development, which is a key factor in building urban poor resilience (ADB, 2022). Capacity building should continue to include conflict management, organizational development and

strengthening, financial management, and others based on needs assessment. Financial management is critical since respondents noted that while income opportunities allowed them to afford additional assets such as electrical appliances, some said this increased their expenses for electricity. Sustainability can also be ensured through regular updating of the community profile and needs assessment, participatory approaches, and multistakeholder engagement. A social impact assessment can identify positive and negative impacts and ways to enhance or mitigate them.

Psychological support also needs to be improved. As noted by Sapkota *et al.* (2022) and Yusoff and Yusoff (2021), psychological or emotional well-being support is needed given the mental and emotional stress experienced by disaster victims. A mental health and psychosocial support program should be considered and integrated into the health center and other activities, including mental health and awareness activities (seminars, etc.), psychosocial therapy (arts, sports, etc.), guidance counseling, and the presence of mental health practitioners in the resettlement area.

Integration of Eco-DRR-CCA in the Management of Natural Assets

Environment-related initiatives at DVU focused more on health (waste reduction, etc.) and meeting basic needs (food through urban gardening, etc.). While spatial limitations limit activities such as tree planting, environmental enhancement in relocation areas should look beyond the traditional and move toward developing an integrated design during the planning stage within the concept of ecosystem-based disaster risk reduction and climate change adaptation (Eco-DRR-CCA). Eco-DRR-CCA is anchored on sustainable livelihoods and promotes multiple benefits by enhancing ecosystems while also promoting development (Sudmeier-Rieux *et al.*, 2019; United Nations Office for Disaster Risk Reduction [UNDRR], 2020). For example, green-gray infrastructure (e.g., a combination of greening with structural flood control) can be considered when improving or designing resettlement areas.

Reviewing Tenurial Mechanisms to Enhance the Commitment of Resettled Households

While COs aim to ensure that residents abide by the rules, they also potentially provide a disincentive for maintaining or improving the housing unit. Du *et al.* (2020) found that ISFs consider perceived land tenure security as one of the key factors for engaging in informal settlement upgrading or retreat. This also influences the sustainability of resettlement. As emphasized by Sapkota *et al.* (2022), effective resettlement takes place if the four stages of resettlement are done with ease (planning and recruitment, adjustment and coping, community formation and economic development, and

turnover and incorporation) and remain sustainable until the succeeding generations of the displaced community. A review of the effectiveness of the CO in ensuring that resettled households remain and improve their housing units may be considered.

Conclusions

Insights from this case study can guide the government, nongovernment, and business sectors in formulating resettlement interventions that adhere to the BBB. The case of DVU as one of the earliest LGU-initiated and managed in-city resettlement projects in the Philippines demonstrated the positive contributions of the in-city resettlement modality to community resilience in the context of BBB, supporting the case for local government-led in- or near-city resettlement in developing countries with similar contexts. The significant increases in the level of resilience of resettled households after relocation can be largely related to the benefits accruing from in-city resettlement, which facilitated ease in coordination, delivery of social services, participatory community, and multistakeholder engagement by the LGU. As shown in the case study, good practices need to be implemented in the areas of risk reduction, community recovery, and economic recovery within the context of BBB to improve the resilience of resettled households. The delivery of basic services and infrastructure needs, attention to economic opportunities, and support for developing human capital (knowledge, etc.) and social capital (networks, organizations, etc.) within an enabling multistakeholder institutional arrangement through social technologies led to positive outcomes. Social technologies thus help ensure meaningful and effective community participation and multistakeholder engagement in all stages of the project cycle and in community building. Multiple stakeholder engagement effectively contributes to meeting multiple needs by pooling financial and nonfinancial resources otherwise unavailable to the LGU alone. However, clear role allocations and coordination are critical for such multistakeholder arrangements to be effective. Physical infrastructure and the social and economic well-being of the resettled households should be considered to fully address the complexity and multidimensionality of the resettlement process (Correa *et al.*, 2011).

In-city resettlement has been recommended by some studies since it is cost-efficient and more effective in terms of facilitating the adjustment process of relocated families (Gilles, 2012) and has been found to be “more sustainable and acceptable” to beneficiaries and LGUs (Ballesteros & Egana, 2016). In-city relocation also addresses nonvoluntary relocation of ISFs, mostly related to off-city relocation, which has been a barrier in Philippine resettlement projects (NEDA, 2017). However, land affordability or availability has been a significant barrier to resettlement, as in the case of resettlement for managed retreats in the NCR,

Philippines and Vancouver, Canada (Tadgell *et al.*, 2017). This is more so for in-city relocation, where land prices are higher. In the Philippines, NEDA (2017) reports that resettlement initiatives have been hampered by issues such as land acquisition and site development. The positive contributions of in-city resettlement to resilience found in this study can serve as an empirical basis for local governments to implement this modality despite land acquisition challenges and potentially higher project costs.

Lessons learned from the case study point to opportunities for improvement in terms of utilizing social technologies for sustainability, integrating appropriate Eco-DRR-CCA initiatives within strategic spatial planning, and fostering tenurial arrangements that foster the greater commitment of resettled households to contribute to the sustainable development of the community. Given the volatile, uncertain, complex, and ambiguous global context, the management of resettlement areas also needs to be adaptive. Regular multistakeholder evaluation with results feeding back into the project cycle is crucial since it allows learning for adaptive management. Building social cohesion and human and social capital can help ensure that benefits from good practices are sustained and communities continue to build their resilience to disasters through community-driven development. The need for local governments to invest in strategic resettlement planning anchored on BBB is clear given the global trend toward decentralization of disaster management and the heightening of disaster risks amid climate change. Moreover, practitioners are reminded that resilience should move toward transformation (improving upon and not just restoring the status quo) as the goal (ADB, 2019). Social impact assessments to more fully capture long-term improvements in the resilience of resettled households and identify ways to enhance resettlement initiatives are recommended.

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References

- Asian Development Bank. (2019). *Asian Development Outlook. Strengthening Disaster Resilience*. Metro Manila, Philippines. <https://www.adb.org>
- Ajibade, I. (2019). Planned retreat in Global South megacities: Disentangling policy, practice, and environmental justice. *Climatic Change*, 157(2), 299–317. <https://doi.org/10.1007/s10584-019-02535-1>
- Ajibade, I. (2022). The Resilience Fix to Climate Disasters: Recursive and Contested Relations with Equity and Justice-Based Transformations in the Global South. *Annals of the American Association of Geographers*, 112(8), 2230–2247. <https://doi.org/10.1080/24694452.2022.2062290>
- Atwii, F., Sandvik, K. B., Kirch, L., Paragi, B., Radtke, K., Schneider, S., & Weller, D. (2022). World Risk Report 2022. Bündnis Entwicklung Hilft Ruhr University Bochum – Institute for International Law of Peace and Armed Conflict (IFHV).
- Baker, J. L. & Gadgil, G. U. (2017). East Asia and the Pacific's urbanizing context. In J. L. Baker & G. U. Gadgil (Eds.), *East Asia and Pacific Cities: Expanding Opportunities for the Urban Poor*.
- Ballesteros, M. M. & Egana, J. V. (2016). Efficiency and effectiveness review of the National Housing Authority (NHA) resettlement program (No. 2013-28). *PIDS Discussion Paper Series*. Makati City, Philippines: Philippine Institute for Development Studies.
- Bodine, S. P., Tracy, A., & Javernick-Will, A. (2022). Questioning the effectiveness of risk reduction via post-disaster relocation. *International Journal of Disaster Risk Reduction*, 71, 102834. <https://doi.org/10.1016/j.ijdr.2022.102834>
- Campbell, J. R., Goldsmith, M., & Koshy, K. (2005). Community relocation as an option for adaptation to the effects of climate change and climate variability in Pacific Island Countries (PICs). Asia-Pacific Network for Global Change Research.
- Cities Development Initiative for Asia. (2014). *Pre-Feasibility Study: Integrated Flood Risk Management for the City of Valenzuela*. Executive Summary.
- Clinton, W. J. (2006). *Lessons learned from tsunami recovery: Key propositions for building back better*. Office of the UN Secretary-General's Special Envoy for Tsunami Recovery: New York, NY (p. 26).
- Co, J. R. M., Abad, M. C., Felicia, T., Lim, M., & Peteza, J. (2020). Assessment of Valenzuela City's Resilience in Times of Disaster using the Ten Essentials for Making Cities Resilient Toolkit. <https://doi.org/10.13140/RG.2.2.21662.15689>
- Correa, E., Ramírez, F. & Sanahuja, H. (2011). Populations at Risk of Disaster. A Resettlement Guide. Washington, DC: World Bank. <https://openknowledge.worldbank.org/handle/10986/27383> License: CC BY 3.0 IGO
- Davis, I. (2011). What have we learned from 40 years' experience of Disaster Shelter? *Environmental Hazards*, 10(3–4), 193–212. <https://doi.org/10.1080/17477891.2011.597499>
- Du, J., Greiving, S., & Yap, D. L. T. (2022). Informal Settlement Resilience Upgrading-Approaches and Applications from a Cross-Country Perspective in Three Selected Metropolitan Regions of Southeast Asia. *Sustainability*, 14(15), 8985. <https://doi.org/10.3390/su14158985>
- Gilles, S. N. (2012). Humanizing Socialized Resettlement Housing Programs: A Challenge Towards Sustainability Practices in Urban and Rural Communities. University of the Philippines Diliman. <http://www.aisf.or.jp/sgra-in-english/seminar14/ArchStephanieGillesDP.pdf>
- Hallegatte, S., Rentschler, J., & Walsh, B. (2018). Building back better: Achieving resilience through stronger, faster, and more inclusive post-disaster reconstruction. Washington, DC: World Bank. <https://openknowledge.worldbank.org/handle/10986/29867>
- Hijioka, Y., Lin, E., Pereira, J. J., Corlett, R. T., Cui, X., Insarov, G. E., Lasco, R. D., Lindgren, E., & Surjan, A. (2014). In: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects*. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Barros, V. R., C. B. Field, D. J. Dokken, M. D. Mastrandrea, K. J. Mach, T. E. Bilir, M. Chatterjee, K. L. Ebi, Y.O. Estrada, R. C. Genova, B. Girma, E. S. Kissel, A. N. Levy, S. MacCracken, P. R. Mastrandrea, and L. L. White (Eds.)]. Cambridge, United Kingdom and New York, NY, USA: Cambridge University Press (pp. 1327–1370).
- Intergovernmental Panel on Climate Change. (2022). *Climate Change 2022: Impacts, Adaptation, and Vulnerability*. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.- O. Pörtner, D. C. Roberts, M. Tignor, E. S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (Eds.)]. Cambridge, UK and New York, NY, USA: Cambridge University Press (pp. 3056). <https://doi.org/10.1017/9781009325844>
- Jeggle, T. & Boggero, M. (2018). *Post-disaster needs assessment: Lessons from a decade of experience*. European Commission, GFDRR, UNDP, and the World Bank. <https://openknowledge.worldbank.org/handle/10986/30945>
- Jensen, S., Hapal, K., & Quijano, S. (2020). Reconfiguring Manila: displacement, resettlement, and the productivity of urban divides. In *Urban Forum* (Vol. 31, pp. 389–407). Springer Netherlands.
- Liedtka, J. (2020). Putting Technology in Its Place: Design Thinking's Social Technology at Work. *California Management Review*, 62(2), 53–83. <https://doi.org/10.1177/0008125619897391>

- Manatunge, J. M. A. & Abeyasinghe, U. (2017). Factors Affecting the Satisfaction of Post-Disaster Resettlers in the Long Term: A Case Study on the Resettlement Sites of Tsunami-Affected Communities in Sri Lanka. *Journal of Asian Development*, 3, 94–124. <https://doi.org/10.5296/jad.v3i1.10604>
- Mannakkara, S. & Wilkinson, S. (2014). Re-conceptualising “Building Back Better” to improve post-disaster recovery. *International Journal of Managing Projects in Business*, 7(3), 327–341. <https://doi.org/10.1108/IJMPB-10-2013-0054>
- Mohd, R., Bakar, N. A., Hassan, S. & Hussain, A. H. (2017). Sustainable post-disaster recovery plan for flood victims in Gua Musang and Kuala Krai, Kelantan. *Pertanika Journal of Social Science and Humanities*, 25(S), 1–12.
- Molina-Azorin, J. F. & Lopez-Gamero, M. D. (2014). Mixed methods studies in environmental management research: prevalence, purposes and designs. *Business Strategy and the Environment*, 25(2), 134–148. <https://doi.org/10.1002/bse.1862>
- Nalau, J. & Handmer, J. (2018). Improving Development Outcomes and Reducing Disaster Risk through Planned Community Relocation. *Sustainability*, 10(10), 3545. <https://doi.org/10.3390/su10103545>
- Nassar, D. M. & Elsayed, H. G. (2018). From Informal Settlements to sustainable communities. *Alexandria Engineering Journal*, 57(4), 2367–2376. <https://doi.org/10.1016/j.aej.2017.09.00>
- Navarro, A. M., Reyes, C. M., & Francisco, K. A. (2021). UN common country assessment update for the Philippines. Quezon City, Philippines (pp. 181). <https://pidswebs.pids.gov.ph/CDN/PUBLICATIONS/pidsdps2106.pdf>
- National Economic and Development Authority. (2011). Philippine Development Plan 2011–2016. <https://www.officialgazette.gov.ph/downloads/2011/05may/Phil-Dev-Plan-2011-2016-FRONT-MATTER-BSA.pdf>
- National Economic and Development Authority. (2017). Philippine Development Plan 2017–2022. <https://pdp.neda.gov.ph/wp-content/uploads/2017/01/PDP-2017-2022-10-03-2017.pdf>
- Pornasodoro, K. P., Silva, L. C., Munárriz, M. L. T., Estepa, B. A., & Capaque, C. A. (2014). Flood Risk of Metro Manila Barangays: A GIS Based Risk Assessment Using Multi-Criteria Techniques. *Journal in Urban and Regional Planning*, 51–72.
- Reganit, J. C. (2022). House OKs bill mandating on-site relocation for informal settlers. Philippine News Agency. <https://www.pna.gov.ph/articles/1188567>
- Santiago, J. S., Manuela, W. S., Tan, M. L., Sanez, S. B., & Tong, A. U. (2017). Agency-driven post-disaster recovery: A comparative study of three Typhoon Washi resettlement communities in the Philippines. *International Journal of Disaster Risk Reduction*, 27, 480–489. <https://doi.org/10.1016/j.ijdrr.2017.11.012>
- Sapkota, B., Shrestha, S., K. C., B., Khorram-Manesh, A. (2022). Disaster Management and Emergency Preparedness in Low- and Middle-Income Countries. In: *Encyclopedia of Evidence in Pharmaceutical Public Health and Health Services Research in Pharmacy*. Cham: Springer. https://doi.org/10.1007/978-3-030-50247-8_38-1
- Satterthwaite, D., Archer, D., Colenbrander, S., Dodman, D., Hardoy, J., Mitlin, D., & Patel, S. (2020). Building Resilience to Climate Change in Informal Settlements. *One Earth*, 2, 143–156. <https://doi.org/10.1016/j.oneear.2020.02.002>
- Sridarran, P., Keraminiyage, K., & Fernando, N. (2018). Acceptance to be the host of a resettlement programme: A Literature Review. *Procedia Engineering*, 212, 962–969. <https://doi.org/10.1016/j.proeng.2018.01.124>
- Sudmeier-Rieux, K., Nehren, U., Sandholz, S. & Doswald, N. (2019). Disasters and Ecosystems, Resilience in a Changing Climate - Source Book. Geneva: UNEP and Cologne: TH Köln - University of Applied Sciences.
- Tadgell, A., Mortsch, L., & Doberstein, B. (2017). Assessing the feasibility of resettlement as a climate change adaptation strategy for informal settlements in Metro Manila, Philippines. *International Journal of Disaster Risk Reduction*, 22, 447–457. <https://doi.org/10.1016/j.ijdrr.2017.01.005>
- United Nations. (2014). Pro-poor urban climate resilience in Asia and the Pacific. UN ESCAP. Nairobi, Kenya.
- United Nations Department of Economic and Social Affairs. (2017). World population prospects: The 2017 revision, key findings and advance tables.
- United Nations Office for Disaster Risk Reduction. (2020). Ecosystem-Based Disaster Risk Reduction: Implementing Nature-based Solutions for Resilience, United Nations Office for Disaster Risk Reduction – Regional Office for Asia and the Pacific, Bangkok, Thailand.
- United Nations International Strategy for Disaster Reduction. (2017). Build Back Better in recovery, rehabilitation, and reconstruction. Consultative version. Geneva, Switzerland. https://www.unisdr.org/files/53213_bbb.pdf
- United Nations High Commissioner for Refugees. (2014). Planned Relocation, Disasters and Climate Change: Consolidating the Good Practices and Preparing for the Future. Report prepared by . March 12–14, 2014. Sanremo, Italy. <https://www.unhcr.org/54082cc69.pdf>
- Usamah, M. & Haynes, K. (2012). An examination of the resettlement program at Mayon Volcano: What can we learn for sustainable volcanic risk reduction? *Bulletin of Volcanology*, 74, 839–859.

- Valeriano, S. (2012). Informal settlements in Metro-Manila: Relocation community program and design. [Doctor's dissertation, University of Hawai'i]. <https://core.ac.uk/download/pdf/84320382.pdf>
- Vanclay, F. (2017). Project-induced displacement and resettlement: from impoverishment risks to an opportunity for development? *Impact Assessment and Project Appraisal*, 35(1), 3–21. <https://doi.org/10.1080/14615517.2017.1278671>
- Velasco, M. A. M. (2016). Examining stakeholders collaboration: A case of relocating informal settlers in the Philippines. *Proceedings of the DLSU Research Congress*, Vol. 4.
- World Bank. (2011). Executive summary Typhoons Ondoy and Pepeng: Post-disaster needs assessment. Washington, DC: World Bank. <https://documents1.worldbank.org/curated/en/551271468296967206/pdf/646280v10ESW0P0BOX361542B000PUBLIC0.pdf>
- World Bank. (2017). Promoting inclusive growth by creating opportunities for the urban poor: Philippines urbanization review policy notes. Washington, DC: World Bank. <https://openknowledge.worldbank.org/handle/10986/27141>
- Yusoff, S. & Yusoff, N.H. (2021). Building social resilience after the 2014 flood disaster. *Pertanika Journal of Social Science and Humanities*, 29(3). <https://doi.org/10.47836/pjssh.29.3.13>