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Long Term Disaster Recovery Planning in Urban Centers: The Role of Land Tenure and  
Housing in Reducing Vulnerability

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## **Abstract**

Climate change will increase the number and severity of climate-related disasters, which have a disproportionate impact on a city's vulnerable groups. We present an analytical framework that highlights the needs of vulnerable populations from the perspective of land tenure and access to housing and how cities can integrate these needs into long-term recovery strategies. We base our framework on an analysis of recovery frameworks. We examine how these documents define and address the needs of vulnerable populations in developed and developing country contexts, and explore land use mechanisms that cities might employ in the pre- and post-disaster periods to promote long-term recovery for vulnerable groups. We conclude with examples of potential strategies cities might take to integrate long-term disaster recovery plans into their overall disaster mitigation plans and what types of long-term recovery mechanisms a city might employ and how to understand the recovery needs of vulnerable populations.

**Key Words: Disaster Resiliency, Vulnerable Populations, Land Tenure, Housing**



## INTRODUCTION

It is well-established that climate change will cause an increase in the number and severity of climate-related disasters. These include both rapid onset disasters such as hurricanes, typhoons, and floods as well as slow onset disasters such as drought and environmental degradation. Coupling the impact that climate change has on the severity and frequency of natural disasters with increasing urbanization in cities globally, the number of people displaced or otherwise affected by a disaster is increasing significantly. According to the 2015 Report by the Internal Displacement Monitoring Centre, 22 million people were displaced by natural disasters in 2013 (IDMC, 2015). Disasters have a disproportionate impact on vulnerable populations. Further, hundreds of millions of residents (predominately vulnerable populations) are at risk of disasters and this number continues to grow as urban and periurban areas continue to grow. The financial implications of natural disasters are also rising – related to both the immediate response and long-term recovery (Satterthwaite 2007; Rodin, 2014).

In urban centers, vulnerable groups include, but are not limited to, the poor, individuals who are not fully employed, renters and residents in informal settlements (Caron et al., 2014; Rodin, 2014). Yet, in the immediate aftermath of a natural disaster, residents of the affected region who would not otherwise be considered part of the vulnerable population become vulnerable and are equally in need of assistance. Moderate- and middle-income households, for example, are at a much greater risk of becoming vulnerable after a disaster due to loss of savings, housing, jobs, or potentially loss of a family member. These households, like many households in the affected area, will require immediate response assistance, as well as significant support and assistance to achieve long-term recovery in the 2-5 year period following the disaster. Gould (2009) finds that households with access to resources before the disaster will continue to have access to resources post-disaster and fare best in the recovery. On the contrary, low- to middle-income households face significant challenges in recovery due to lack of resources. The conceptual challenge is that planners and humanitarian aid workers neither tend to consider moderate and middle-income households as vulnerable nor in need of long-term assistance. We argue that they are.

Socio-economic and cultural variables such as gender, ethnicity, race, religion, and citizenship status also increase the vulnerability of vulnerable populations, necessitating tailored responses. Acknowledging that the increase in any urban area's vulnerable population following a disaster puts a long-term strain on the region's overall recovery efforts, we highlight specific questions and topics that planners and aid workers should consider on how to address vulnerable populations in resiliency planning, with an emphasis on land tenure and housing approaches.

To address and prepare for such disasters, both city and national governments have had immediate response strategies that allow them to identify potential safe havens and to determine how resources will be deployed in the immediate aftermath of a disaster. More recently, cities have begun to employ resiliency strategies ranging from infrastructure and environmental engineering programs to community awareness campaigns (Rodin, 2014). To complement these localized plans, US agencies such as the US Federal Emergency Management Agency (FEMA), National Institute of Science and Technology (NIST), and Department of Housing and Urban Development (HUD) and international organizations including the United Nations and World Bank have introduced frameworks that provide recommendations on how to improve resiliency and mitigate disaster related risks. Such resiliency actions have the potential to reduce the negative impacts of disasters on a large range of residents and enable cities and regions to recover more quickly as they promote investment in mitigation measures for the built environment and build

social networks. In addition to implementing resiliency plans, it is critical for cities to plan not only for the short-term response, but also for the long-term recovery. We define long-term recovery as the steps (social, natural and built environment) needed to return a city or region that experiences a natural disaster to its pre-disaster state or better.

In this we paper, we analyze the approach that regions, especially urban centers, can take to prepare long-term recovery strategies, with an emphasis on vulnerable populations that complement ongoing resiliency efforts as well as short-term response plans. We argue that the disaster planning and management process must integrate the needs of vulnerable populations in order to be effective. Unless the needs of these populations are integrated into the region's overall disaster planning framework, planners, community development professionals and civic leaders, will inefficiently and ineffectively address community's needs. To that end, we present a set of questions that act as an analytical device for planners and humanitarian aid workers to use to include long-term recovery strategies that highlight a wide range of vulnerable populations' needs into a city's overall disaster strategy *from the perspective of land tenure and access to housing*.

We base our paper on the analysis of two distinct sets of data: 1) international recovery frameworks and 2) domestic recovery frameworks. With respect to recovery frameworks we will examine how they define and address the needs of vulnerable populations (e.g., through social and infrastructure services, land use controls and mechanisms and other regulatory controls that can be implemented pre- and post-disaster). As the need for such long-term recovery strategies and resilience/disaster planning is global, we will analyze international and domestic recovery frameworks (i.e., FEMA's National Disaster Recovery Framework, the 2015 GFDRR Disaster Recovery Framework and the 2015 UN Sendai Framework) to understand how long-term recovery and vulnerability are conceptualized across the disaster planning and management process and can be applied in both developed and developing country contexts.

The paper has three sections. First, we start with a review of the different types of urban-based vulnerable populations that can be affected by disasters and a review of the literature on how to address vulnerable populations in resiliency planning. We focus on how these vulnerable groups are produced.

The second section analyzes four existing disaster resiliency and recovery frameworks and how they emphasize the need for focusing resiliency on the nexus of vulnerable populations, land tenure and property rights, and land use planning. We examine recently-released World Bank and United Nations frameworks as well as domestic frameworks specifically from the Federal Emergency Management Agency (FEMA) and National Institute of Science and Technology (NIST). The section highlights how these frameworks define who potential vulnerable groups might be, their needs, and how to ensure these populations will be best served in the short- and long-term recovery efforts after a disaster.

We conclude with examples of potential strategies cities or urban areas might take to integrate long-term disaster recovery plans into their overall disaster mitigation approaches. This section highlights successes that cities and regions have achieved in existing disaster resiliency and recovery plans. We include a series of questions that communities and their leaders should ask in order to understand who the vulnerable are, what new vulnerable groups might be created, how they should integrate long-term recovery plans into the overall disaster plan, what types of long-term recovery mechanisms the city should employ and how to understand the recovery needs of vulnerable groups.

## VULNERABLE POPULATIONS

### *The 'production' of vulnerable groups*

We use the word production for two particular reasons: one, to highlight the fact that vulnerable groups are not static, for who is vulnerable following a disaster and to what changes both across time and across the recovery process, and two, to indicate that vulnerable groups are produced through a range of *context specific* political, socio-economic and related institutional factors. If these populations are adequately addressed in pre-disaster planning (both through top down programs, but also by promoting social capital) the government can mitigate the effects in the post-disaster period (Aldrich 2012). Our attention to context is important and that which compels us to bring both domestic and international disaster recovery frameworks into relationship with one another in this paper.

The range of land tenure and property rights relations in urban areas is diverse, complex and will depending on local governance structures and in many cases remnants of colonial land administrative systems (Payne et al. 2014). Below we briefly discuss a range of vulnerable groups such as renters, migrants and other populations that are often overlooked or whose land tenure and potential housing needs are not fully considered prior to a disaster in recovery planning or in risk mitigation measures. As land tenure and housing prior to a disaster often structure opportunities and resources available to such groups thereafter.

### *Low-, Moderate- and Middle-Income Households*

What may obviously appear to be a vulnerable population, this population may increase in the immediate period after a disaster. These households are less able to access privately available resources and services post-disaster and therefore face significant challenges in recovery (Gould 2009). Further, this population can grow significantly in the period after a disaster due to primary wage earners not being able to return to work. These populations are also less likely to purchase disaster related insurance (when available such as flood or earthquake) and therefore require public support (Priest 2005).

### *Renters / Tenants*

The category renters or tenant is a broad one that covers persons and families who rent apartments/flat, single room dwellings in informal settlements, or single-family homes. Post-disaster recovery and reconstruction strategies tend to omit renters and others who did not own houses prior to a disaster illustrates the extent to which organizations and governments lack a robust rights based approach in housing recovery (Gould, 2009: 193).

### *Squatters and Migrants*

Another vulnerable group that faces challenges in accessing housing after a disaster are poor families who are squatting at the time a disaster strikes (Gould 2009). Squatters might either occupy privately-owned or state-owned land with no long term security to stay. Given that squatters do not own land, they also do not have collateral to raise capital (take a loan) to buy a plot of land and rebuild a home (Payne et al. 2014).

Migrants, especially undocumented ones, often occupy low paying jobs in urban centers, compelling migrant families to live in informal settlements or squat on government or private land. While the Sendai framework specifically suggests that the skills, knowledge and capacities of migrant populations can be “useful in the design and implementation of disaster risk reduction” (United Nations, 2015:21), we note that migrant groups might only participate if they are visible to planners and if they wish to be found. In many urban areas in the United States and globally migrants may be undocumented or illegal and therefore purposefully try not to be found. Migrants often fear persecution, repatriation or both and

found hide from authorities. Post-disaster such undocumented workers or illegal migrants suffer secondary displacement from disaster zones and due to their status and their exclusionary measures that they take to protect themselves, they are become vulnerable to sickness, squatting in unstable housing, and loss of employment. Much like renters, in the absence of property (home) ownership they do not qualify for government-sponsored benefits such as temporary housing or hosting programs such as those created following Hurricane Sandy.<sup>1</sup>

Planners thus need to consider that the category ‘migrant’ is a robust and diverse category of people, shaped by the specific context (i.e., place and reason for residency) as well as which stage of the process they are included in (preparedness, recovery or reconstruction).

The tenure insecurity of all of these groups makes them additionally vulnerable to land and financial speculation or land grabbing by the state or private sector investors (Caron et al., 2014).<sup>2</sup> With the displacement that accompanies disaster, large unoccupied areas often in attractive location for large-scale development become available for real estate investment. If alternative housing is not available (again due to distortions in the post-disaster rental market), squatters, renters and other vulnerable populations are often are dependent on their former landlords and the private market to address the rental market (Gould 2009). Landlords, however after receiving financial compensation for their losses, may or may not rebuild; rebuilding is not required. Instead, landlords may sell their land to others that is put to a different use altering the available housing stock for the recovering population.

In discussing the framework for improving resilience, Godschalk (2003: 140) identifies that “the poorest and most vulnerable communities within a city are the weakest links in its mitigation capacity.” As such, it is critical to incorporate vulnerable populations into resiliency planning to develop a truly resilient community. Similarly, Satterthwaite (2007) argues that resiliency strategies must establish a pro-poor policy to resiliency to be truly effective and promote coordination among the many social service stakeholders operating in a region. Gould (2009) expands upon the need for appropriately addressing in the wake of a disaster.

## DISASTER RESILIENCY FRAMEWORKS

Next we examine how disaster recovery and risk reduction frameworks in the United States and International frameworks conceptualize the land tenure, housing and vulnerability nexus. The two analyzed international frameworks<sup>3</sup> are the World Bank Group led Guide to Developing Disaster Recovery Framework and the United Nations Sendai Framework for Disaster Risk Reduction 2015-2030 adopted at the Third World Conference on Disaster Risk Reduction. These frameworks provide an overarching structure to post-disaster response and risk reduction measures for member of the global donor community funding disaster response and mitigation measures. The analyzed United States frameworks are the Federal Emergency Management Agency (FEMA) National Disaster Recovery Framework (NDRF) and the National Institute for Science and Technology (NIST) Community Resilience Guide. The NDRF was

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<sup>1</sup> Migrants also have skills, knowledge and capacities useful to the recovery and reconstruction process.

Undocumented workers can play an instrumental role in post-disaster clean up and reconstruction as shown following Hurricane Katrina. However due to space constraints we do not discuss this issue here.

<sup>2</sup> This point is in reference to the disaster capitalism thesis.

<sup>3</sup> Another relevant framework is the IASC Framework on Durable Solutions for Displaced Persons, which we do not incorporate in this paper but will in subsequent analysis.

published in 2011 and NIST Community Resilience Guide was published in 2015. The NDRF provides a structure for communities to establish pre-disaster plans and implement long-term recovery strategies post disaster. Likewise, NIST provides the structure for communities to establish community-based resilience frameworks.

### *International Donor Frameworks*

The World Bank Group led, Global Facility for Disaster Reduction and Recovery, Guide to Developing Disaster Recovery Framework (hereafter GFDRR) shows government officials how land tenure and property factor into preparatory planning for disaster recovery through the use of a land risk survey/assessments, a land tenure survey/assessment and a land availability/assessment (2015: 19). Collecting such land tenure information up front prior to a disaster provides information that supports the recovery strategy design, and provides data for reconstruction and if needed relocation efforts for housing and livelihood activities (Mitchell, 2011; Caron et al. 2014).

The GFDRR recommended land tenure survey/assessment would make potentially vulnerable persons visible. The assessment analyzes land and tenure records which would identify potential overlapping claims or ownership disputes that would delay or stop recovery and reconstruction (World Bank, 2015). Access to such information would have been useful in Haiti earthquake reconstruction, as ownership disputes delayed reconstruction efforts (GAO 2013; Caron et al. 2014). However, the GFDRR neither reveals nor indicates that formal land tenure documentation is the exception and not the norm (Caron, et al. 2014; Payne et al., 2014). Vulnerable groups such as poor migrants, squatters and renters do not possess formal land records nor formalized rental agreements. Planners and others who execute or supervise the land tenure survey need to be aware that formal and official records will be incomplete and will need to consider other forms of land tenure that existing in urban environments (Payne et al., 2014; NRC 2013).

The United Nations Sendai Framework guides government leaders through a comprehensive set of recommendations “to prevent new and reduce existing disaster risk through the implementation of integrated and inclusive .... measures that prevent and reduce hazard exposure and vulnerability to disaster” (2015:7). The framework’s attention to vulnerability focuses on 1) “paying special attention to people disproportionately affected by disasters, especially the poorest” (ibid: 9); 2) suggests that an inclusive process entails collecting disaggregated data with respect to sex, age, disability, 3) promotes the collection and dissemination of “relevant data and practical information” and 4) complementing science-based information with traditional, local and indigenous knowledge and practices (9-11).

The Sendai Framework presents high-level recommendation that illustrate the nexus between land tenure and housing and point out that the disabled are a frequently overlooked group with special needs during recovery, essential aspects of disaster risk reduction and resilient recovery are missing. The framework does not include how to define the poorest. While the demographic variables of sex, age and disability are necessary to achieve socially inclusive risk reduction and recovery programming, they also can intersect with poverty and can influence vulnerability to and ability to recover from disaster events. Land tenure security creates a structural position within society that in its articulation with sex, age and disability might worsen one’s ability to recover. Given the social position of squatters and renters mentioned above land tenure status be another type of relevant demographic data to collect. Following a disaster, land tenure status then might be disaggregated by sex, age and disability thereby providing

early information about affected groups, which humanitarian actors could use to design temporary shelter and special housing needs for the displaced.

The Sendai Framework's instruction to collect relevant data and traditional knowledge and practices is equally vague. Lack of a definition or concrete examples of what constitutes relevant data and traditional knowledge and practices risks excluding important knowledge and insights about land tenure systems, use and management. In the context of post-disaster management a growing body of scholarship highlights the important role local land knowledge plays in building resilience, reducing conflict, and sustaining livelihoods (Lyon, 2009; Archer and Boonyabanha, 2011; Mitchell, 2011; Caron et al., 2014).

The Sendai Framework brings attention to land tenure and housing issues in several ways. First, it instructs users to formulate public policies that acknowledge the potential need to relocate human settlement in disaster risk zones (14). Second, the framework suggests mainstreaming "disaster risk assessments into land use policy development and implementation, including urban planning, land degradation, assessments and informal and non-permanent housing" (15) as well as coastal flood plain, dryland, and wetland management, and third, improving construction codes, standards and practices in informal and marginal settlements.

In the context of this discussion and its focus on integrating land tenure and housing into recovery and reconstruction planning, we note that relocation entails not only adequate financial compensation for land and housing, but also recognition between place, livelihoods, and belonging (Caron, 2015). Relocation entails more than moving people and physical structures from disaster risk zones to safer locations. Persons implementing the relocation process need to take into consideration the attachment that people often have to places and that attachment often exceeds land's instrumental, economic use for livelihood (Caron, 2009 and 2015).

While the Sendai Framework provides high-level guidance to global, regional, national and local level actors, the framework's utility and ability to address "underlying disaster risk factors... and contribute to sustainable development" (9) is weakened by a lack specific and concrete examples of what constitutes relevant data or information. Mention of informal land tenure to complement references to informal and non-permanent housing would improve the framework's utility. Planners should not assume that informal or non-permanent housing is constructed on land held informally. We show our below in the context of post-Haiyan reconstruction that the relationship between informal land tenure and informal housing is complex.

Finally, the Sendai Framework does point out the recovery phase after a disaster is an opportune time to take measures that reduce disaster risk "in the short, medium and long term" (2015:19) and that include land use planning exercises, improving construction standards, learning lessons from previous disaster experiences, and integrating reconstruction into longer term development planning (what is often know as bridging the gap between humanitarian aid and development).

#### *United States / Domestic Frameworks*

The FEMA National Planning Framework is a series of five planning frameworks that focus on the different elements required to establish secure and resilient communities. The framework began as the National Disaster Recovery Framework and has since expanded to include the following frameworks:

- National Prevention Framework

- National Protection Framework
- National Mitigation Framework
- National Response Framework
- National Disaster Recovery Framework

The National Prevention Framework focuses on the roles of the entire community (from residents to government officials) in actively preventing terrorism and other attacks on the United States. The National Protection Framework focuses on the government capabilities required to protect communities from disasters. For the purpose of this paper, we focus on the other three frameworks from the context of natural disasters and do not analyze the National Prevention or Protection Frameworks.

The National Mitigation Framework (2013) recognizes that resiliency planning ranges from the individual to regional governmental agencies and that resiliency is maximized when these entities' mitigation efforts are done in concert and coordination. The Mitigation Framework cites the need to take a comprehensive approach that addresses economic, health and social services, housing, infrastructure and natural and cultural resources. The Mitigation Framework focuses on these topical areas versus specific populations (such as the range of vulnerable populations in a community) but does identify the role that nongovernmental organizations play in establishing and implementing mitigation principles. It can be assumed that these NGOs are at least in part focused on vulnerable populations.

While the National Mitigation Framework does not go into depth in encouraging the establishment of land use controls such as building codes or controlling development in floodplains, it does cite the need to coordinate mitigation efforts with other planning efforts that oversee these land use measures.

The next stage of the National Planning Framework is the National Response Framework (2013). The National Response Framework provides guidance on establishing response plans that can be implemented immediately after a disaster. The National Response Framework focuses on the steps needed to provide immediate response services such as temporary housing, medical assistance and distribution of other basic goods to impacted households. These are critical services that will be required by all those affected by the disaster, especially vulnerable populations.

The final state of the National Planning Framework, the National Disaster Recovery Framework (NDRF) (2011), provides guidance on long-term recovery from a disaster. This framework serves as a bridge between the mitigation and preparedness planning efforts with long-term recovery. The NDRF provides a detailed set of objectives for pre- and post-disaster planning efforts. The pre-disaster planning efforts emphasize the need to implement appropriate land use measures based on the environment and types of potential disasters. Likewise, the NDRF emphasizes the need to establish recovery plans that fully address the needs of vulnerable and at-risk populations. The plane encourages collaborating with stakeholders such as NGOs who work closely with these populations in the pre- and post-planning process to ensure their interests are met.

In general, the National Planning Framework emphasizes roles and desired outcomes and does not provide a detailed description on the process required to achieve such pre- and post-disaster plans. Similar to the Sendai Framework, the National Planning Framework is weakened by not providing clear examples or structured steps on how to establish successful plans. As a result, except for highly sophisticated

municipalities, communities may not have the expertise or systems in place to implement successful mitigation and recovery plans.

The second US Framework is the National Institute for Science and Technology Community Resilience Guide (2015). The Community Resilience Guide was published to help communities set priorities and allocate resources (both financial and non-financial) to maximize resiliency. The guide establishes a six-step approach to improve resiliency. These steps are:

1. Form a collaborative planning team: This team includes a clear leader and team members from a range of community, public sector, nonprofit and private sector stakeholders. Stakeholders clearly understand roles and responsibilities.
2. Understand the Situation/Risks: This includes a full assessment of population types (including vulnerable populations), the built environment (including land use controls and mechanisms) and how these two environments function together.
3. Determine Goals/Objectives: The plan must establish the long-term goals and identify metrics to measure success in achieving the goals and objectives.
4. Plan Development: Establish the resiliency plan with an emphasis on incorporating resiliency efforts into existing community plans
5. Plan Preparation, Review and Approval: Document the approach, obtain feedback from stakeholders and community members and execute the plan.
6. Plan Implementation and Maintenance: Execute all elements of the plan (facilitated by team established in Step 1) and evaluate the plan periodically and update as needed.

In regards to vulnerable populations, the NIST Community Resilience Guide recognizes the importance of understanding the needs of vulnerable populations and recommends communities to include organizations and agencies that support such populations in the collaborative planning team. Further, when assessing the situation and current conditions, NIST encourages a thorough assessment of social dimensions. Social dimensions include housing, community services and other institutions that support all populations in the community, including vulnerable populations. While the guide makes these basic suggestions, it acknowledges that establishing specific measures to support vulnerable populations fall out of the scope of this guide.

In terms of land use planning, NIST encourages planners to align and integrate land use planning measures with resiliency planning. This is done in two ways – first by understanding and assessing current land use controls when completing the built environment situational analysis. Second, it indicates that the plan should, when necessary, make recommendations on revising land use controls to increase resiliency. This process is driven, in part, by ensuring that land use planners and other relevant agencies are included in the planning team.

In regards to both vulnerable and land use planning decisions, NIST strongly encourages coordination among all stakeholders to achieve resiliency. Satterthwaite (2007) presents a similar argument that successful resiliency depends on coordination among stakeholders. However, as a national framework, the NIST guide does not provide detail on how to integrate a wide and diverse stakeholders into the process and align plans. When considering land use and vulnerable populations (both subjects that are often addressed by agencies not directly involved in emergency management planning), this integration and alignment is critical.

## CONCLUSION

The role that land tenure insecurity and housing play in creating vulnerabilities cannot be overstated. While existing disaster frameworks highlight the importance of identifying and addressing these vulnerabilities, they do not offer concrete or detailed guidance on how to address the needs of these populations. Consequently, some recovery plans did not adequately address the needs of vulnerable populations in recovery planning. For example, the Government of Sri Lanka did not have a National Policy on Housing, Land and Property Restitution when the tsunami struck in 2004. Consequently, tsunami-displaced families that were renting when the tsunami hit found themselves left behind in transitional shelter three years later (Caron 2009). As camps were set to close in Sri Lanka's capital and largest urban center, Colombo on January 1, 2008, a random sample survey of the 1,323 families living in camps in late 2007 found that renters comprised 16% of camp residents; 66% of families were squatting at the time of the tsunami (Caron 2009). Amongst families affected by Typhoon Haiyan, over half of the affected population had tenure arrangements based on verbal agreements (Sherwood et al, 2015: 56).

Furthermore, the relationship between informal land tenure status and informal housing may not follow 'traditional' patterns. Following Typhoon Haiyan, affected families may have owned land but rented their house or rented the land and owned the house rather than the more traditional and perhaps assumed relationship of renting the land *and* renting the house (Sherwood et al, 2015: 53). Effective pre-planning focused on vulnerable populations can help to alleviate and shorten the need for temporary and insecure housing in the early recovery period.

To facilitate this pre-planning, communities must collect data on vulnerable populations and land tenure. Data collection as part of disaster risk reduction measures should not be burdensome. If land tenure status cannot be easily collected at the individual level through census activities or community enumeration activities, then neighborhood level data might suffice for pre-planning. Census data together with Geographical Information Science (GIS) might delineate specific neighborhoods with higher proportions of vulnerable groups.

Finally, while long-term recovery needs to be attentive to land tenure and housing needs, evaluations of post disaster management programs over the past fifteen years show that recovery and a 'durable' solution to displacement does not end with housing solutions alone. Permanent housing does not end the effects of post-disaster displacement if affected families are unable to recovery employment and livelihood opportunities (Caron 2009, Lyon 2009, Sherwood et al 2015) and brings a socio-economic rights (right to livelihood) together with a right to housing (Gould 2009). Employment and livelihood needs are especially salient when families are relocated from low-lying coastal zones. In cases of relocation access to housing is as important as job opportunities when building resilient communities in relocation areas. Eighteen months into Typhoon Haiyan recovery, members of relocated families still moved between areas of relocation and their former residences (now in no-build zones) due to a lack of livelihood opportunities in relocation areas (Sherwood et al 2015: 54). The same was true in Colombo following the 2004 Indian Ocean tsunami (Caron 2009). However, what is apparent in post-Haiyan recovery and which is relatively different in terms of recovery and reconstruction programming from other recent disasters is the extent to which land documentation (i.e., titles or other formal legal documents) in the Philippines is needed to establish past residency/occupancy as a right to a livelihood claim or to apply for a job (Sherwood et al 2015: 53) more so than to establish a claim to compensation to rebuild a home (Caron 2009, NRC 2013).

An example of addressing long-term recovery and resiliency from a holistic perspective is in New York following Superstorm Sandy in 2012. The devastation caused by the storms signaled to New York and New Jersey that communities needed to be rebuilt and planned in a manner to become more resilient and mitigate against future disasters. In New York, to meet this need, the state established the NY Rising Community Reconstruction Program to assist the most impacted communities to redevelop in a way to make the areas more physically, socially and economically resilient. One such neighborhood that established a recovery plan through NY Rising was the Southern Brooklyn Peninsula Community (Brighton Beach, Coney Island, Manhattan Beach and Sea Gate Reconstruction Plan 2014). The community's infrastructure, housing and business activities were all severely impacted by Superstorm Sandy and it was clear that the storm illuminated issues regarding emergency preparedness and government/non-profit coordination. In a community meeting this became apparent as residents stated, "that preparation and implementation of plans to protect vulnerable populations, evacuation protocols, and disaster relief would need to be improved for future disasters" (Brighton Beach, Coney Island, Manhattan Beach and Sea Gate Reconstruction Plan, 2014: page 12). Throughout the planning process, vulnerable populations and nonprofits assisting them were included in the plan.

As a result of this recognized need, the reconstruction plan included a number of strategies to improve resiliency for vulnerable populations through a series of land use and housing efforts. The plan included a number of projects focused on improving the infrastructure and land use in at-risk communities as well as specific measures to make vulnerable households more resilient and better serve them during and in the immediate aftermath of a disaster. These efforts include improving coastal flooding management and flood-resistant landscaping, improving residential and commercial infrastructure and utilities, providing funding to low- and moderate-income households for home repairs, and establishing strategies to better inform vulnerable populations (such as non-English speakers and homeless populations) of future disasters and emergency management services to ensure they understand the resources available for them (Brighton Beach, Coney Island, Manhattan Beach and Sea Gate Reconstruction Plan, 2014).

Post Superstorm Sandy community members and planners recognized the gaps of service provided to vulnerable populations in the Southern Brooklyn Peninsula Community and established a series of strategies to improve the resiliency for vulnerable populations through ensuring resilient housing and improving infrastructure in and around vulnerable communities.

Similar post-disaster planning efforts occurred in Berkeley, CA following the 1989 Loma Prieta earthquake. The city passed a series of ballot measures to fund seismic improvements and retrofits for public facilities as well as adopting tax transfer programs and permit fee rebate programs to more easily enable homeowners to make retrofits. (Godschalk 2003). Similarly, the city of Oakland offers grants to low-income households for the completion of seismic retrofit repairs (City of Oakland Housing and Community Development, 2016). Such programs encourage disaster resilient building codes as well as offer specific incentives for vulnerable populations to increase their resiliency.

Such efforts taken by New York, Berkeley and Oakland offer examples of how resiliency planning can plan for and better support vulnerable populations. The specific actions that planners should take vary greatly by the community and the existing land use and housing policies that are in place in that City. To determine these needs, planners should incorporate a series of basic, but critical questions into the planning process to understand how to improve the resiliency of vulnerable populations.

1. How are 'vulnerable' groups defined and by whom?

2. When are vulnerable groups identified (as part of DRR or only after a disaster event)?
3. Who are the vulnerable populations in the community? Has this population changed recently?
4. What organizations, nonprofits, and agencies support this community?
5. Are these populations currently included in existing disaster resiliency plans? If so, how?
6. Have key stakeholders reviewed and provided input on existing disaster resiliency plans for these communities?
7. What are the housing and land tenure needs and characteristics of vulnerable populations pre-disaster? How can the needs of these vulnerable populations be provided in the short- and long-term recovery periods post-disaster?
8. What systems are in place to account for the land tenure post-disaster? Do they address all vulnerable populations?
9. What policies can be in place to ensure that vulnerable populations continue to have access to housing post-disaster?
10. In the case of relocation, how are agencies going to address housing and livelihood concerns?

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