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Post-disaster recovery dilemmas: challenges in balancing short-term and long-term needs for vulnerability reduction

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ABSTRACT

Following disasters, governments often clamor to quickly reduce risk, rebuild communities and restore permanence. The pressure to urgently address complex, difficult decisions can result in reactive policies that may increase long-term vulnerability of affected populations. Sri Lanka in the aftermath of the 26 December 2004 tsunami represents such an example: a hastily designed coastal buffer zone policy has incited massive relocation of affected populations and resulted in social, economic and environmental problems that threaten the well-being of poor coastal communities. We review the impacts of this policy from its inception, days after the tsunami hit the island, until its revision, approximately 10 months following the disaster. We then apply a framework to conceptualize the components of vulnerability within Sri Lanka's coastal, human-environment system and to identify where post-disaster policies should focus to reduce vulnerability of coastal populations more effectively. From this analysis, it is apparent that the buffer zone policy gave disproportionate attention to reducing exposure to future tsunamis and, subsequently, did not address the critical social, economic and institutional factors that influenced sensitivity to the hazard. Post-disaster policies aimed at sustainable re-development should be informed by an analysis of the components of vulnerability that comprise a system and how these can be most effectively influenced during the separate short-term and long-term phases of rebuilding.

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1. Introduction

The world witnessed a series of large-scale coastal disasters in 2004 and 2005. After such events, the public and their leaders often clamor to re-build quickly, yet better than before (Comfort, 2005). However, reactive policies generated under urgent pressures often fail to address the root causes of vulnerability¹ and, in the long term, may even amplify the social, economic and environmental weaknesses that turn natural hazards into large-scale disasters. The Sri Lankan

coastal buffer zone policy that was devised in the period immediately following the Indian Ocean tsunami of 2004 may well be an example of such a policy. In this paper, we review Sri Lanka's coastal land-use policy before the tsunami and the evolution and impacts of the short-lived post-tsunami buffer zone policy on socio-economic disparities, livelihoods, communities and the environment. We then present a vulnerability framework to guide post-disaster policy decisions and avoid the problems associated with hastily devised post-disaster policies. The discussion highlights the complex challenges and tradeoffs

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¹ Vulnerability refers to the capacity of an individual or group to anticipate, cope with, resist and recover from the impact of a natural hazard and is composed of a variety of factors that determine the degree to which lives and livelihoods are put at risk by such events (Blaikie et al., 1994).

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that policymakers face in the aftermath of disasters and suggests that, amidst these difficult decisions, it is necessary to keep vulnerability reduction as a fundamental focus of recovery efforts. This discussion has direct application for other communities that have recently been devastated by disasters.

2. Post-tsunami policy: the coastal buffer zone

Only days after the tsunami struck Sri Lanka on December 26, 2004, the government of the island nation established a “no reconstruction” coastal buffer zone that varied in width, from 100 m in the South to 200 m in the East and North (Samarasinghe, 2005, Government of Sri Lanka and Development Partners, 2005). Repair or reconstruction of homes within this zone was prohibited. However, hotels that had suffered less than 40% structural damage were allowed to remain within this area (Ministry of Urban Development and Water Supply et al., 2005). Soon after the policy was decreed, the construction of semi-permanent and permanent homes began at government-designated resettlement sites located outside of the buffer zone. However, reconstruction was unevenly distributed and paced throughout the country. In some cases, reconstruction has progressed with little attention to pre-existent development regulations, land-use policies (IUCN, 2005a) or the social impacts of resettling people, often unwillingly, kilometers away from their home community (Shanmugaratnam, 2005). This policy has been identified as one of the primary reasons for Sri Lanka’s sluggish recovery process and has been a major obstacle to the equitable rebuilding of homes and livelihoods (Charny and Martin, 2005; Harris, 2005; Luthra, 2005a,b). Criticisms of the policy derived from the lack of community consultations in establishing the buffer zone boundary and in the relocation process (Shanmugaratnam, 2005; World Bank, 2005). In many locations, the buffer zone did not correlate with tsunami damage or take into account relevant landscape features that influence exposure to hazards (Jayasuriya et al., 2005). The government’s defense of the buffer zone policy was that it needed to act quickly before people moved back to risk-prone areas and that application of a uniform buffer was the fairest and quickest way to do so (Jayasuriya et al., 2005).

Approximately 10 months after the tsunami, the government decided to revise this policy, citing land scarcity issues as the primary impetus for reconsideration (Government of Sri Lanka and Development Partners, 2005). However, the details of a new policy remain unclear to many affected communities, leaving continued confusion as to where building will be allowed and when it will proceed (Luthra, 2005a,b). Though short-lived, the impacts of the buffer zone policy may remain long after its revision. Negative impacts on equality, livelihoods and the environment (Oxfam, 2005) have already resulted from the policy, which has potentially increased vulnerability of affected populations in the long-term rather than decreasing it.

3. Coastal land-use policy before the tsunami

The concept of protecting a margin of coastal land from over-development and removing populations from hazard-prone

areas has been hailed in the past not only as a plausible measure to reduce damage from tsunamis and other coastal hazards (Preuss, 1983), but also as an effective way to preserve coastal ecosystems. In the 1980’s, a set-back policy was enacted in Sri Lanka as part of a coastal zone management plan that aimed to reduce coastal erosion, conserve coastal ecosystems and protect areas of cultural importance (Hettiarachchi and Samarawickrama, 2005). Construction without a permit was theoretically restricted within a 300 m distance from the high water mark. However, due to lack of enforcement, ocean-front lands were developed, often in high densities. These unregulated lands close to the sea and the ample livelihood opportunities provided by the coastal zone created ideal conditions for the growth of low-income communities. Hotels and other tourism-related businesses also expanded into the “restricted area”.

4. Impacts of the post-tsunami buffer zone

4.1. Socio-economic disparities

Through building restrictions, the post-tsunami buffer zone has amplified pre-tsunami socio-economic disparities that were exposed by the discriminating impact the wave(s) had on poorly constructed buildings. Most of the homes completely destroyed by the tsunami were one-story houses occupied by low-income families. These houses were poorly built with weak brick and mortar walls that had no structural connection to the foundation and, thus, were swept from their footings or collapsed completely. In contrast, stronger multi-story reinforced concrete buildings, such as many of the mid to high-end hotels, resisted the impact with only slight non-structural damages (Khazai et al., 2006). Wealthier people who owned these well-constructed buildings typically were able to repair them. In contrast, most of the poor fishing communities had nothing left to repair and have been forced to relocate away from the buffer zone and their livelihood source, in order to receive government sponsored housing. An example of these disparities can be seen in Arugam Bay, located on the eastern coast of Sri Lanka, which was once a fishing and tourism-based community. In May of 2005 the only structures that were still standing were a few concrete homes and a group of small two- or three-story hotels that were undergoing repairs and expansion in the midst of the recovery confusion. Without money, government support or clarity about where they would be resettled, many poor people who had lived inside the buffer zone prior to the tsunami were still waiting for information on where they would be resettled.

Effectively, the short-lived buffer zone policy initiated a process of gentrification in which wealthier hôteliers and the tourism industry benefited from rapid expansion while fishing communities were marginalized from the littoral area (Rice, 2005). This situation has increased pre-disaster socio-economic disparities that were revealed by the patterns of tsunami destruction across poor and wealthy homes (Oxfam, 2005). It has also served to create distrust regarding the government’s dedication to meet the needs of poor communities affected by the tsunami (Shanmugaratnam, 2005).

4.2. Livelihoods

The urge to resettle people outside of the buffer zone has created tensions between immediate concerns of another tsunami, a relatively rare event for the Indian Ocean, and long-term well-being with respect to livelihood opportunities and habitability at relocation sites. Although the buffer zone policy was intended to protect people from an improbable tsunami risk, it has had unintended consequences of threatening coastal livelihoods and exposing people to other more persistent hazards, such as flooding, at resettlement camps. Shortly after the tsunami, a government resettlement camp had been established in Hambantota more than 2 km from the ocean and was heralded as a reconstruction success due to the speed at which a large number of new, high-quality homes had been built (Fig. 1). Yet, fishermen who were relocating to this site were deeply concerned about how they would continue fishing and did not foresee any other livelihood options. These concerns have also been echoed at other resettlement camps, where people have been relocated far from the fishing community where their livelihoods were based (Shanmugaratnam, 2005).

The natural environment surrounding the camp in Hambantota was sparsely vegetated by a scrub forest, but lacked other natural resources of use to people, which is an extreme contrast to the resource rich coastal zone inhabited by fishing communities for generations. Thus, life in this new setting will require new livelihood alternatives and support for livelihood adaptation. Other resettlement camps have been sited in harsh environments or in wetland areas, which are likely to experience flooding during the rainy season (Charny and Martin, 2005). Although camps located kilometers from the ocean may be safe from a future tsunami, there are a variety of other, potentially more pervasive challenges that inhabitants will have to face in these new environments.

4.3. Disruption of communities

In addition to relocating communities to a foreign natural environment, the resettlement process incited by the buffer zone has also resulted in unfavorable social conditions. For example, at the Dickwella resettlement camp in the Matara district of southern Sri Lanka more than 1000 people of different social, economic and cultural backgrounds were brought to live together. This is a drastic change from the small traditional villages of a few hundred residents where people lived before the tsunami. A sense of community is difficult to attain in large resettlement camps with non-traditional groupings of socio-economic and cultural classes. Thus, community networks, which are crucial for fostering adaptation and learning from a disaster (Adger et al., 2005; Miller, 2005) may have been severely disrupted. A failure to address long-term needs such as social and cultural issues when selecting resettlement camp locations for coastal communities has potentially made it difficult for people to cope with the trauma of the disaster and may increase vulnerability to social conflicts.

4.4. Environmental impacts

The buffer zone policy had clear impacts on human communities, however, its impact on the environment has been less

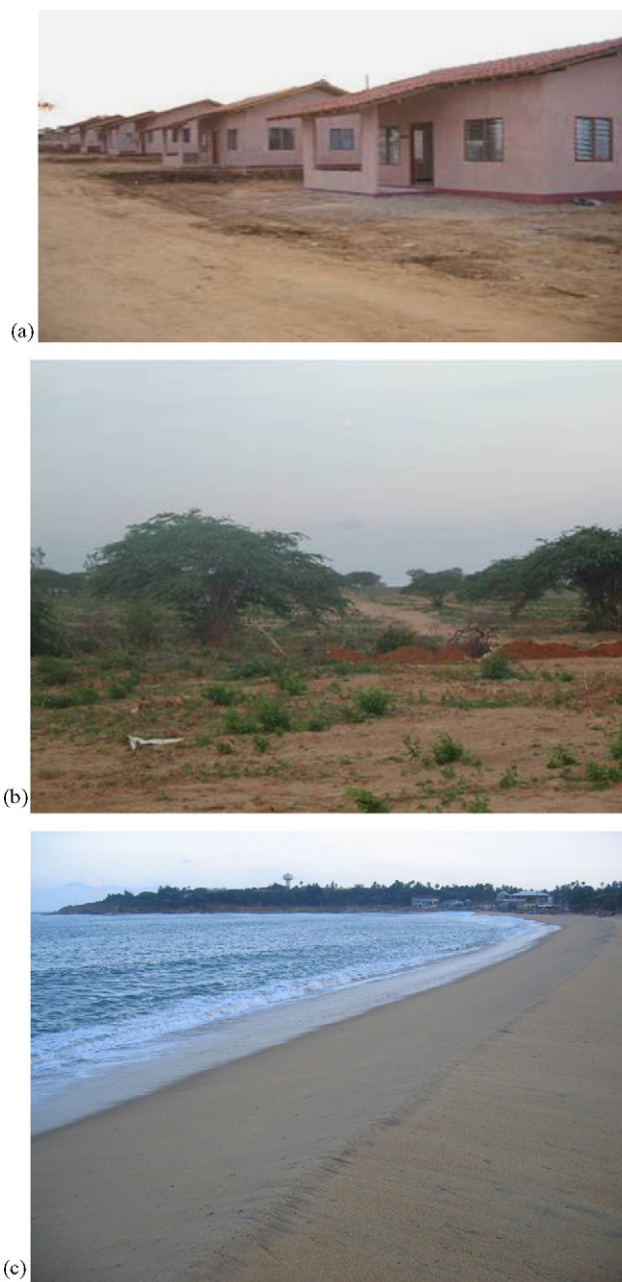


Fig. 1 – (a) The site of a resettlement camp for tsunami victims who lived in the coastal zone of Hambantota, (b) the environment surrounding the resettlement camp and (c) the coastal zone of Hambantota. The resettlement site is approximately 2 km away from the coast and has a terrestrial natural resource base of scrub forest compared to the coconut trees and fish resources in the coastal zone, where the future camp residents have lived for generations.

straight forward. Although the policy was designed as a preventative measure against future tsunamis, it could have positive impacts on the environment by reducing human pressure on coastal resources. However, resource pressures were being displaced alongside the relocation of coastal communities and, thus, were threatening inland ecosystems.

The protection of the coastal environment is critical since coastal natural resources are fundamental components to livelihoods and human security as a physical protection from the tsunami, storms and erosion. For example, communities located inland of reefs degraded from years of coral mining suffered higher damage and loss of life than communities located a short distance away on the same coastline, but sited inland of intact coral reefs (Fernando and McCulley, 2005). Similarly, sand dunes played a critical role in saving people's lives. The Yala Safari Game Lodge, a beachside hotel where dunes had been removed to create an unobstructed ocean view, was completely decimated with high mortality rates (Liu et al., 2005, authors' observations). A few hundred meters away at the Yala Village hotel, located on the same stretch of beach but protected by an extensive natural sand dune system, little damage was recorded. Although the reduction of homes in the buffer zone would likely relax pressure on coastal resources, the vacancy created by the displacement of local populations is, in many places, being filled by expanding hotels, which as the Yala example demonstrates, can have a significant impact on the natural environment (Rice, 2005). Furthermore, the tremendous construction needs and land requirements for relocation sites have presented an array of additional environmental threats for both coastal and inland ecosystems (IUCN, 2005b). The materials required to build more than 90,000 homes may degrade natural systems through intensified pressure and exploitation of sand dunes, coral reefs and forests for rebuilding materials (such as sand for cement, coral for limestone and trees for timber) (IUCN, 2005b). The location of some resettlement sites in or near ecologically sensitive areas, such as wetlands, or located near national parks also threatens environmental conservation in these places (IUCN, 2005c). For example, mangroves have been cleared for resettlement sites (IUCN, 2005b), despite their demonstrated importance as a physical buffer to the tsunami throughout South East Asia (Dahdouh-Guebas et al., 2005). Such events have supported post-tsunami fears that many policies on land use and deforestation would be ignored due to urgent pressures to rebuild (IUCN, 2005a,b,d). Such pressures and land-use violations could result in a net negative impact for Sri Lanka's natural environment. Terrestrial and coastal environmental degradation and conservation should be considered in concert (Stoms et al., 2005), particularly, in an island system such as Sri Lanka. Although a coastal buffer zone is one way to protect coastal ecosystems, often it is not feasible to exclude people from the lands they have inhabited for many years without significant social and environmental repercussions, especially in places like Sri Lanka where land is limited. In such cases, natural resource management plans that involve local people and support programs that address the root causes of coastal environmental degradation, such as poverty, livelihood practices and education, may offer more sustainable protection of these important ecosystems and their functions in the long-term. Policies that aim to balance sustainable human use of coastal natural resources and human habitation in the foreshore area may introduce fewer social and environmental problems than quick fix measures.

5. A vulnerability framework to guide post-disaster policy

The hasty application of post-disaster policies with long-term repercussions may only amplify socio-economic inequalities and compromise livelihoods, community structure and complicate environmental protection, as the Sri Lanka example has demonstrated. Instead, it is crucial that cautious analysis be given to developing an adaptive plan that aims to reduce long-term vulnerability to future hazards by considering the many social, physical, environmental, economic and political components that interact to influence vulnerability (Turner et al., 2003). Turner et al. (2003) outlined a framework for understanding how the components of vulnerability interact and influence each other, which permits identification of where effective actions can be taken to reduce overall vulnerability. A variety of researchers have conceptualized the components of vulnerability as exposure, resistance and resilience (Pelling, 2003) or exposure, coping capacity and recovery potential (Bohle et al., 1984). In their framework, Turner et al. (2003) describe and elucidate the interacting components of vulnerability as exposure, sensitivity and resilience (coping/response, impact/response, adjustment/adaptation response). Here, we apply this framework to the coastal human–environment system in Sri Lanka to broadly illustrate how the buffer zone policy has influenced human vulnerability and to identify system components that could be influenced to more effectively reduce vulnerability (Fig. 2). Such a framework may be applied and adapted to other post-disaster situations to help guide recovery policies.

Within this framework, the “Adjustment and Adaptation/Response” to a hazard plays a critical role in affecting vulnerability. An adjustment refers to a purposeful or targeted action made over a short-period of time for reducing the effects of a hazard. An adaptation, either biological or cultural, refers to a response that typically occurs over a longer period of time and is often not the result of a deliberate decision by an individual or group (Burton et al., 1978; Mileti, 1999). When the vulnerability framework is applied to the Sri Lanka case, it is apparent that the buffer zone policy was an “adjustment” that focused on swiftly reducing exposure. Exposure is an external dimension of vulnerability (Füssel and Klein, 2006) that is typically a product of physical location and the characteristics of the surrounding built and natural environment (Pelling, 2003). In the proposed framework (Fig. 2), an adjustment or adaptation designed to reduce vulnerability of affected populations should ideally influence the system's sensitivity, an internal component of vulnerability (Füssel and Klein, 2006). The sensitivity component then interacts with the exposure component of the system (Fig. 2). By focusing disproportionately on exposure and not addressing the factors contributing to sensitivity, such as socio-economic disparities, poverty, land tenure and lack of economic diversification of poor communities, the buffer zone policy displaced and exacerbated many of the core problems that made people vulnerable to the tsunami at impact and in recovery. Furthermore, relocating people out of the coastal zone (against their will) does not promote a long-term process of adaptation.

Attempts to reduce exposure through the implementation of the buffer zone policy have been highly problematic due to

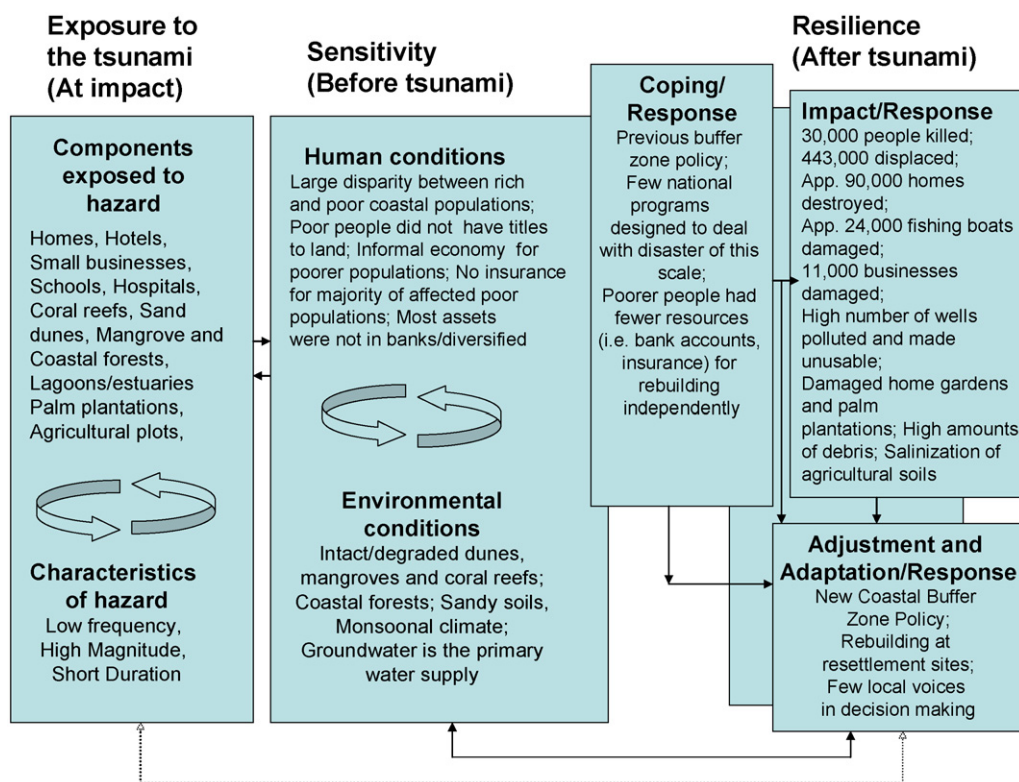


Fig. 2 – The adoption of the Turner et al. (2003) vulnerability framework for the tsunami affected areas of Sri Lanka. Solid lines represent the interactions between components of vulnerability, as proposed by Turner et al. (2003). Dashed lines represent a deviation from these interactions in post-tsunami Sri Lanka as a result of the buffer zone policy. Although, these boxes are not exhaustive in their list of factors that comprise each component of vulnerability, they represent many of the dominant issues of concern for the most vulnerable populations in the tsunami affected areas of Sri Lanka.

cultural, social, economic and environmental limitations. Often individuals or social groups live in areas where they are exposed to hazard risk because there are few other viable options and the threat of a potential hazard, such as a tsunami, is less of a risk than the immediate threats of hunger and poverty (Maskrey, 1989). Thus, people are unlikely to change their living patterns to reduce their exposure to a natural hazard if it increases their sensitivity to more pressing, frequent threats (Degg and Chester, 2005). Such rationale may explain why many people in the tsunami affected fishing communities of Sri Lanka do not want to move from the coastal zone where their livelihoods are based. More sustainable exposure mitigation measures in Sri Lanka could include policies directed towards heightened conservation and restoration of coastal resources, such as sand dunes, coral reefs and mangroves, which acted as effective protective features against the wave(s) and also reduce erosion and flooding due to monsoons and storm surges. Protection and management of these resources to reduce exposure may also act to decrease sensitivity indirectly by protecting a vital source of food for local people and income for fishermen. Such policies would require the participation and support of local communities. Increased technical and logistical assistance for livelihood alternatives other than destructive income generating activities, such as illegal coral mining, sand mining and mangrove cutting, could be a way to enlist local participation and promote sustainable use practices. These

policies should be developed through community consultations to determine livelihood alternatives that are preferable to destructive practices and to identify the incentives necessary to make more sustainable practices viable within the local context.

An effective “Adjustment and Adaptation/Response” strategy should directly address the factors that influence sensitivity to disasters. Such measures could include programs that offer livelihood support through technical assistance, increase opportunities for low socio-economic groups to access financial resources, such as micro-finance institutions and insurance measures, and help provide secure access to land and natural resources (Blaikie et al., 1994). For example, in Sri Lanka, support for fisherman could include the education and financing needed to diversify fishing techniques and to form co-operatives, which in times of stress could provide a more diverse and, thus, potentially, more resilient social and financial network. Policies directed towards the sensitivity component of vulnerability may also support overall development goals and well-being in coastal Sri Lanka.

6. Conclusions

Reactive policies are not uncommon and are understandable in the context of the urgent policy needs in post-disaster situations. Relief and short-term recovery efforts should be

urgent and rapid; however, redevelopment policies should be cautiously developed upon comprehensive, site-based assessments of risk and vulnerability alongside continual consultations with all stakeholders. Short-term recovery efforts must aim to minimize the time needed for people to recover a safe shelter and livelihood security. During this “transitional” phase it is critical that communities are consistently supported, consulted and informed as longer-term plans are developed to diminish anxiety and frustration associated with uncertainty. To accomplish the objective of long-term strategic planning, multi-year and multi-sector policies need to be developed to facilitate the sustainable management of coastal resources, livelihood support, strengthening infrastructure, urban planning, insurance tools and disaster preparedness at the national, regional and community level. In these endeavors, the community must play a major role in deciding both short-term and long-term strategies. Especially for the latter, time is needed to plan and communicate appropriately; hurried policies with long-term implications should be avoided, despite the temptation to restore permanence as soon as possible. Hastily designed policies implemented shortly after a disaster may have long-term impacts that are difficult to undo and may increase human vulnerability in the long-term.

It is crucial that within both the transitional phase and longer-term re-development phase, vulnerability reduction is the ultimate guiding goal. As the discussion herein has demonstrated, typical quantitative measures of progress, such as the number of houses built, often hailed as a proof of recovery and advancement, may not adequately reflect a reduction in vulnerability. In fact, it may represent the opposite in some cases. Vulnerability reduction requires a holistic understanding of the complex interactions between the physical, environmental and social factors that contribute to it (Cardona, 2003). Measures that support environmental protection, maintenance of desired social structures and livelihoods can be implemented in both the transitional and long-term recovery phases, so that pre-disaster weaknesses are not perpetuated or amplified into the future.

Due to complications resulting from the buffer zone policy, the government of Sri Lanka is now revising the post-tsunami coastal regulations and should be commended for critically rethinking its policies. Although Sri Lanka's challenges are far from over, the revision of this policy represents a second chance to rebuild in a sustainable and equitable manner. Hurricanes Katrina, Rita, Stan and Wilma, in their paths of destruction, have created similar massive relief and reconstruction needs for many coastal communities. These disasters represent opportunities to address the pre-existent vulnerabilities of affected communities and to rebuild in a way that seeks to mitigate these problems in the future. To be successful, however, these processes require a combination of short-term recovery and long-term planning that involve negotiating with affected people on a continual basis, while maintaining distinct objectives between short-term and long-term goals. As the Sri Lankan experience has shown, confusion between these objectives can delay the recovery process and increase vulnerability of affected populations.

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