Cultures of Coping: Adaptation to Hazard and Living with Disaster in the Philippines

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All of us are probably familiar with the folk tale of the three pigs; how each pig built a house in a different way, the lazy one out of straw, the not so lazy one out of wood, and the industrious one out of brick. And then along came the big, bad wolf that blew down the straw and wooden houses and left only the brick structure standing. Implied in this story is another message about what is considered best practice when it comes to risk management and disaster preparedness. The emphasis is all about applying the appropriate technology (a brick house) to withstand the perceived hazard (strong winds) that has come to constitute the dominant way in which disasters are conceived of and prepared for in western imaginings and policy. It is assumed that people are put 'at risk' from hazards because they are in the wrong spot at the wrong time; the proper response is to apply the necessary technological solution to predict or prevent the threat and so reduce the risk.

The fact, however, that disasters impact on some people more than others persuaded a group of scholars in the 1980s to reconceptualize disasters as more properly the result of human actions; that while hazards are natural, disasters are not. Social systems generate unequal exposure to risk by making some people more prone to disaster than others and that these inequalities are largely a function of the power relations (class, age, gender and ethnicity among others) operative in every society. Critical to discerning the nature of disasters was a novel appreciation of the ways in which human systems place people at risk in relation to each other and to their environment, a causal relationship that is best understood in terms of an individual's, household's, community's or society's *vulnerability* (Hewitt 1983, Wisner 1993, Blaikie et al. 1994, Cannon 1994, Hewitt 1995, and Lewis 1999). Employing vulnerability as a conceptual framework in this manner, disasters often appear more as the consequence of misconceived developmental problems rather than natural events, as the product of the deficient relation between the physical and organizational structures of a society rather than as a break with its 'normal' lineal expansion (Ferguson 1999: 236-241). As a consequence of this change in thinking, the dominance previously accorded technical interventions that stress predicting hazard or modifying its impact has increasingly been called into question

by an alternative approach that seeks to combine the risk which people and communities are exposed to with their abilities to cope with its consequences.

Assessing the relative vulnerability of communities applies equally to all societies but attention has been particularly focused on developing countries whose poverty, "undisciplined" populations, and poor governance are largely held responsible for magnifying both the frequency and magnitude of disasters. Hurricane Katrina, then, that devastated 233,000 km^2 of the southern U.S.A. in August 2005 is a timely reminder that it is not just the 'poor' who are vulnerable but that the 'rich' are, too, even if their exposure is of a different order. Moreover, the extensive media coverage that this hurricane received has graphically demonstrated to the rest of the world that no one country has an exclusive monopoly on poor people, opportunistic looters, or ineffectual officials. While these points have largely found voice in one way or another, commentary on the nature of the failed levee system protecting New Orleans from Lake Pontchartrain has been more muted. The storm surge associated with the hurricane that breached the artificial embankments and caused most of the city to flood is seen as a failure of the appropriate technology and not as the application of an inappropriate one. That is, the 350 miles of levees were built to withstand a category three storm but not one of intensity four or five. The answer now as it has been on at least two former occasions when there was extensive flooding (after hurricanes in 1947 and 1965) is to raise the embankments higher than their present four meters. Each time the levees are heightened, of course, the magnitude of the next breach is also raised accordingly. Just like the pig snug in his brick home, those who put their trust only in technology feel secure in the thought that they have got it right and if there is anything to do it is only to build a still bigger brick house or dike.

This physical and conceptual over-dependence on technology is just as much a form of vulnerability and as potentially devastating for disaster-prone societies like the Philippines. There is little consideration given to alternative strategies that are less reliant on technology and lay greater stress on community-based disaster management. For most people in such societies, hazards and disasters are "frequent life experiences" or simply accepted aspects of daily life. They are not perceived as abnormal occurrences the way western social scientists looking through different epistemological lenses depict them, but as normal everyday events (Bankoff 2003: 179-183). So common in fact, that even the histories of these societies are largely shaped by the interrelationship of the natural to the human, of the physical to the social.[1] Moreover, such societies are rarely in a position to pursue the option of a technological solution to risk management as they lack the financial resources to do so. Instead, the emphasis is more on flexible use of

technology and on enlisting people's participation as an essential element in disaster management through the formation or encouragement of grassroots organizations and community level preparedness.

FLEXIBLE USE OF TECHNOLOGY

Historical records provide evidence of cultural adaptation to the constancy of environmental threat that most readily conforms to accepted notions of substantiation. In particular, architecture offers a unique means of examining the human-environment interchange. The form that structures took and the method and fabric of their construction are indicative of the degree to which known seismic and meteorological hazards were considered or whether the building proceeded largely according to external codes of competency and functionality. The simple nipa and palm hut, in all its local manifestations, is a case in point. This type of dwelling quite clearly serves as a much more suitable basis from which to develop construction techniques appropriate to local conditions. It has also proven extraordinarily resilient in historical terms despite its repeated vilification by successive colonial and national governments, who have alternately branded it as "primitive", "fire-hazard" or "squatter settlement" and banished or removed it whenever possible. These indigenous architectural forms are often closely adapted to environmental conditions. Thus traditional house styles in the Batanes had low ceilings as a precaution against the frequency of typhoons in the islands (Blolong 1996, Cayabyab and de Guzman 1998).

Spanish architects, on the other hand, appear to have been initially either unaware of or blithely indifferent to local conditions. The Manila that was built on the wealth of the trade bonanza across the Pacific during the early seventeenth century was constructed in the style and manner of a Hispanic city anywhere else. As a result, the devastating earthquake of 30 November 1645 eventually reduced the city to ruins. Subsequent colonial architecture shed its utter disregard for seismic activity, and consequently lost much of its grace of line and form that usually characterize Spanish architecture. Public construction techniques, so evident in the use of extensive buttresses, massive body structures, and the squat bell towers found in provincial churches, were designed to minimize such damage. The style even became known, rather suggestively, as 'earthquake baroque' (Rantucci 1994:64). Domestic architecture, too, underwent a similar radical transformation. Fixed foundational posts gave way to the greater use of bamboo and the employment of other techniques designed to increase flexibility and to compensate for a certain amount of earth movement. Solid upper storeys were replaced by ones constructed from lighter materials. In fact, the style usually referred to as 'Spanish' was in reality more of a syncretic adaptation of Hispanic and indigenous building techniques.

While modern building materials and techniques cannot be said to be particularly well-adapted to local conditions or have their origins in indigenous cultures, modifications in the design and construction of much informal housing exhibits interesting adjustments to living in low-lying areas where flood is a constant threat or a recurring presence for many months of the year. The building of a second storey where the 'living rooms' are situated and the concomitant use of the 'downstairs' in such a manner that its sudden and regular abandonment involves negligible damage to property and its long-term inundation minimal inconvenience to the daily running of the household, has many parallels to the manner in which traditional houses had been raised above ground level on molave poles known as *harigues* for much the same purposes. There are sound architectural reasons for the "rediscovery" and incorporation of such building techniques into design-built modern structures as well as informal ones that prompted the recent adoption of modern building regulations on Tuvalu that require the floors of new houses to be raised above ground level as a precaution against the increased incidence of flooding due to global warming and rising sea levels. In fact, the measure is a return to a more traditional form of architecture (Lewis 1990: 245).

The flexible use of technology is also very much present in the form of local agricultural systems whose practices demand re-evaluation from the perspective of providing an effective mechanism for reducing crop losses and averting the likelihood of disaster, especially famine, rather than that of efficiency and yield by which they are normally assessed. Crop diversification as an adaptive strategy is a common feature of traditional farming methods as a means of providing access to a secure food source in times of climatic adversity (Lim 1994: 257). Indeed, there is even evidence that high yield varieties of genetically altered rice (HIVs) may be incorporated into such a farming strategy, not on account of their greater productivity, but for their shorter growing cycles that are seen as an asset against drought in years of poor rainfall.[2]

Again, the case of the Ivatan also raises some intriguing questions about the way in which 'outside experts' may need to reassess their notions of *minifundia* or land fragmentation in developing societies. Held to be the unfortunate consequence of equal inheritance among siblings, the division of land among all heirs is generally regarded as an almost "feudal" relic of an unreformed land system that restricts output, hinders economies of scale and obstructs the efficient deployment of labor. Such views may start from the erroneous assumption that the desired norm is larger fields that customary practices have somehow unwittingly undermined. On the contrary, land fragmentation among the Ivatan is regarded as an important mechanism for ensuring food security. Planting in widely scattered parcels minimizes the likelihood that an entire harvest may be lost to hazard and increases

the chances of some food sources even in the worst of circumstances (Blolong 1996: 17). In societies exposed to the constant threat of hazard, such farming strategies make good sense from the perspective of local farmers who are mainly engaged in minimizing risk rather than maximizing surplus (Scott 1976). Unfortunately, the increased commercialization of agriculture and the reliance on cash-crops have adversely affected these types of adaptive strategies (Alexander 1997: 299).

A final form of expertise employed to manage hazards often resorted to when other adaptive strategies had failed was for the survivors to migrate and relocate their settlement in a safer location. In this way, the people of Lipa abandoned the beachside site of their town in 1756 and moved to another location inland. Similarly, survivors from the town of Guinobatan destroyed by the eruption of Mt. Mayon in 1814 moved first to Mauraro and then to Panganiran in search of a safer place further removed from the activity of the volcano (AMO Box 13-2/4). Other ethnographic literature reports similar movement of residence and migration as strategies that were adopted by communities to minimize risks or reduce mounting losses (Torry 1978: 175 and 1979: 519-520). In particular, James Spillus notes how historically migration was one of the principal strategies adopted to cope with typhoons on Tikopia, a small island in the Solomons (1957). Migration was also a noted feature in communities following the eruption of Mt. Pinatubo in 1991, some of whom went abroad as overseas contractual workers (Mula 1999: 126-130).

GRASSROOTS COMMUNITY LEVEL PREPAREDNESS

Communities in the Philippines have largely been left to their own capabilities to deal with hazard; the recent 'nationalization' of disaster management is part of the centralization program of the modern state. Societies in the archipelago have a rich tradition of community associations traceable back to at least the early seventeenth century in contrast to a popular and scholarly literature that mainly regards the formation of nongovernment organizations (NGOs) as a modern phenomena that owe their origin to the political radicalization of the martial law years (Lubi 1992: 22, Constantino-David 1997: 26-27, Constantino-David 1998, and Luna 2001: 216). There is also a long history at the local level of formal and informal networks and associations committed to individual and extra-familial welfare that enhance people's capacity to withstand the magnitude and frequency of daily misfortune and natural hazard as experienced in the archipelago. Many of these developments have gone largely unnoticed. Seeking to uncover more single-purpose associations in relation to community welfare according to their own criteria of what such organizations should comprise, western social scientists often fail to

recognize the existence of other more multipurpose ones that do not share the same outward form but fulfill many of the same functions.

The first evidence of mutual aid associations is the religious fraternities known as *cofradías* that date from at least 1594 (Barrion 1961 and Ikehata 1990: 111-112). While these associations were primarily religious, they also had important charitable functions: the care and succour of the sick and dying (AAM 40.A.1 Folder 8), providing funds in the case of illness and bereavement (AAM 40.A.1 Folder 9), and generally enjoining its affiliates 'to engage in social and charitable enterprises and to aid the unfortunate and needy people in general' (AAM 40.A.1 Folder 11). In fact, the evidence suggest that these cofradías were more than simply a means of expressing religious faith and acted in the way of mutual support and benefit associations on behalf of their members in times of misfortune or distress. Less formal but more prevalent than the cofradías was the manner in which extra-familial work was organized. All across the archipelago, cooperative arrangements existed that shared certain basic characteristics linked to the mobilization of labor (Balmaceda 1927). Aid was rendered on the expectation that it would be returned in kind. Need or sometimes lot determined the order in which help was received; the notion of succession suggested by the Tagalog term of *turnuhan* meaning "a turn". An intriguing question is the temporal origin of these practices with Fr. Colin describing them as early as 1663 (Hollnsteiner 1968: 28).

There is also evidence that this form of community labor was resorted to in confronting natural hazards. In a report initiated in 1914, Harvey Hostetter observed the custom of building a special house "which might be occupied by anyone whose residence would be destroyed by a typhoon" and how after a furious typhoon "the destroyed houses…were rebuilt quickly as soon as the storm was over because the owners could help each other by turn in spite of their lack of funds". The communal construction of dams to protect *barrios* from floods was also apparently common practice, while the purpose of cooperative associations was to assist people with burial services, suggesting a distinct commonality with the cofradías (Balmaceda 1927: 386, 387, 394 and 401). There are rarely rigid epistemological divisions in Filipino cultures that separate the spiritual from the human constructions of nature (Bankoff 2004).

The close association between the ideational and the practical remains very much a feature of the organizations associated with the revolutionary period and the early years of U.S. colonial administration. The Katipunan, the secret society that instigated the revolt of 1896 against the Spanish was also a multipurpose organization being simultaneously a mutual assistance association, a religious brotherhood, and a political grouping.[3] As such it had much in common with other mutual-assistance

societies, many of which were also secretive, being organized in a quasi-military form and developing elaborate rituals similar to those of the Freemasons (Wurfel 1959: 584). The emphasis on mutual assistance and cooperative venture also remained an important feature of more "modern" organizations such as trade unions (Bankoff 2005: 72-76).[4] The new colonial authorities, moreover, were keen to instill the virtues of Jeffersonian democracy in Filipinos and enacted a Rural Credit Law in 1915 to organize small farmers into self-help cooperative societies. A report compiled in 1918 showed the existence of a remarkable number of civic and recreational associations (Census 1921: volume 4, part 1, 16, 37). Rather than the fruits of colonial policy, these numerous registrations more aptly reflect the already existing mutual benefit associations obtaining official approval for their activities under such a rubric just as cofradías in the past had sought religious sanction for the same purposes. More success can be attributed to the Americans' attempt to create agricultural credit cooperative associations (Balmaceda 1924: 18-19). Again, however, the question remains whether such associations were simply superimposed upon already existing networks or turnuhans.

Apart from these formal organizations, reciprocal exchanges of a more informal nature continued to be practiced in rural areas. Called by various names (more especially *tagnawa* or *pinta*) and undoubtedly with regional or even local variations, the basic structure of the system was much the same and recalled the turnuhans of the previous century (HDP Santa Cruz, Albay Reel 1: 141; HDP Santicon, Albay Roll 1: 266; HDP Maniango, Pampanga Roll 36: 27; and HDP Cabugbugan, Tarlac Roll 72: 17). More attention also needs to be paid to the role and function of local Parent Teacher Associations (PTAs) as these soon became the most visible barrio organizations after their foundation in 1926 (Rivera and McMillan 1952: 167). The ostensible focus of their activities was schools but they seem to have provided a much wider range of services and often acted as the focal point for communal endeavours (HDP La Purisima, Albay Reel 1: 257 and HDF Dela Paz, Pampanga Reel 36). Much as earlier barrio organizations had cloaked their activities in a religious guise as cofradías under Spanish colonialism, so now they sought official approval as PTAs given the emphasis placed by American authorities on educational attainments. Nor has the dual nature of these organizations completely disappeared in rural areas of the Philippines where they are now sometimes known as Parent Teacher Community Associations (Atienza 2002).

As conditions in rural areas began to deteriorate during the 1920s and 1930s, organizations that complemented their social activities with more overtly political aims appeared. Many of these organizations such as the *Kapatiran Magsasaka* exhibited similar features of reciprocity

and mutual assistance. A militant anti-landlord peasant union in Central Luzon, it shared many of the features common to mutual benefit societies but also reorganized reciprocal farm labor on a morally euphoric and more militarized basis (Connolly 1992: 94-96). The Japanese Occupation (1942-1945) and the immediate post-war years seem to have further encouraged communities faced by adversity to help themselves. Though mutual assistance and millenarianism remained significant aspects of these movements, increasingly many rural associations fell under communist or socialist influence (Romani 1956: 236, Po 1980: 31-32, Clarke 1998: 58).

The immediate independence period was dominated by events connected to the Huk Rebellion and the military operations involved in its suppression from 1946-1954 (Kervliet 1979). At the village level, though, formal and informal associations continued to provide communities with their only reliable form of security against hazard and misfortune. Fieldwork studies conducted in the 1950s and 1960s show the presence of these reciprocal labor arrangements (Hart 1955: 431-433, Hollnsteiner 1968, and Lewis 1971: 128-138). In parts of Luzon, small neighborhood associations called *puroks* concerned themselves with over-all municipal improvements which were often accomplished in co-operation with local PTAs (Rivera and McMillan 1952, Romani and Thomas 1954 and Romani 1956: 235). Equally interesting is the evidence of rotating credit associations and the existence of other forms of organizations associated with social as opposed to financial savings (Pal 1956: 408 and Lewis 1971: 147-150). As certain newly radicalized sectors of the population began to organize themselves to oppose the dictatorship of Ferdinand Marcos, the first progressive or development-oriented NGOs began to emerge in the early 1970s and to proliferate with the restoration of democratic government after 1986 (Clark 1998: 70-71). The increasing visibility of their activities, however, draws attention away from the local community-based associations or people's organizations (POs) on whose behalf they ostensibly operate. It is these latter associations and networks that are the modern day manifestations of the cofradías, turnuhans, early unions, civic clubs, and PTAs of former years. If the relationship between NGOs and POs creates a degree of ambiguity between the two, the growing emphasis placed on community-based disaster management in recent decades is only a recognition of the essential nature and form that mutual assistance has historically played at the community level (Delica 1997: 34-50, and Heijmans and Victoria 2001: 13-18).

Communities in the Philippines, then, can be said to enjoy a form of 'social capital' if the evident range and extent of formal and informal associations and networks that provide succour and assistance in troubled times are accepted as indicators of its existence. There is evidence, too, that as Putnam et al. argue, social capital is inherited if the

persistence of such forms of civic engagement through the centuries can be taken as a measure of its ability to transcend the generations (Putnam, Leonardi, and Nanetti 1993). Of course, the nature of such associations and networks has not remained static but has evolved both to suit the changing political climate (primarily church-based during the Spanish period, more educationally-related during the American administration, and increasingly politicised since independence) and to meet the contingencies of place and occasion (agriculture, irrigation, house construction, artisanship etc.). Much of the criticism levelled at the extension of the term social capital from the individual or family to the community and the society has focused on the "logical circularity" of the argument: that evidence of its existence leads to positive outcomes which, in turn, are proof that it exists (Portes 1998: 19). According to Michael Woolcock, however, definitions should rather "focus primarily on its sources rather than its consequences since long-term benefits...are the result of a combination of different...types of social relations...[that] shift over time" (Woolcock 1998). While no single factor can suffice to explain why circumstances were so conducive to the formation of social capital in the Philippines, perhaps the important role hazard has played in the daily life of its peoples encourages forms of mutual dependence and cooperative activity (Bankoff forthcoming).[5]

CONCLUSION

Too often our approach towards disaster management mirrors the wider divisions and cleavages between and within societies. Consider again the cultural assumptions behind the tale of the three pigs: how the 'lazy' and 'not quite so lazy' pigs who built in straw and wood exposed themselves to hazard and only found safety by seeking shelter with their brother who evidently had both the forethought and industry to apply the appropriate technology to meet the hazard. Low and medium developed countries are continually being encouraged to adopt large-scale technologically-based solutions to hazards that they can ill-afford, that are of dubious efficacy, and that often impact negatively on already disadvantaged local residents. But the hazards that beset states like the Philippines also engender societies whose very vulnerabilities have fostered particular forms of resilience to adversity and misfortune that express themselves at the neighborhood or community level.[6] Recognition of the importance of such coping practices affects not only the way in which affected populations are "perceived" but also the manner in which disasters should be "managed". Emphasis is placed on enlisting people's participation, more fully integrating their capabilities and applying low-level technology in a manner that is better suited to local conditions and limited financial resources. Such an approach, moreover, contributes to better understanding the roots of people's

vulnerabilities and the structures or conditions that generate them.

The point that expertise in disaster management comes in different forms and is not the exclusive preserve of external (normally "western") nations is brought very much to the fore in this special issue of the PSR. The ensuing discussion on community-based disaster management is envisaged more in the way of a dialogue between those principally engaged in its practice in government (Arnel Capili), NGOs (Zenaida Delica-Willison, Lorna Victoria, Eugene Orejas, Kaloy Anasarias and Celso Dulce), academe (Kelvin Rodolfo and his colleagues, Kathleen Crittenden and her co-authors, Emmanuel Luna and Jean-Christophe Gaillard), and, most importantly, in the communities themselves (Manuel "Ka Noli" Abinales). Not all, alas, are represented in equal measure due to the chosen medium (and language) of exchange that favors some voices over others. And since the contributors come from such varied backgrounds, the application of academic conventions has not been rigorously enforced as it seemed often inappropriate to the particular context and yet another form of "foreign" imposed expertise. Some articles are "documents" in their own right. Interestingly, though there are no dissenting voices about the importance of greater community involvement in disaster management and the need to recognize local capabilities: all advocate the same outcome though not always necessarily for the same reason. There is also a progression in the order in which the articles appear that gives added weight to the overall argument though of course each contribution can be gainfully read in its own right. If Hurricane Katrina can be said to have a 'lesson' for any of us, it is to suggest that western developed countries may have as much to learn about disaster preparedness, management, and recovery from nonwestern developing countries as the latter do from the former.

NOTES

1 Susanna Hoffman and Anthony Oliver-Smith refer to this human-environmental interaction in terms of 'mutuality' and argue that disasters occur where there is a lack of it (Hoffman and Oliver-Smith 1999: 6).

2 Private Communication with Annelies Heijmans, Center for Disaster Preparedness Foundation, Manila, 14 December 2000

3 See Rey Ileto on the role of the Katipunan (1979).

4 A mutual aid association existed among shipyard workers at Cavite from 1851 where the first recorded strike occurred in 1872 (Runes 1983-5: 66-67). Worker associations existed in the late nineteenth century based around craftsmen belonging to a particular shop or neighborhood and the first attempts at organizing a trade union movement occurred in 1902 with the creation of the *Uníon Obrera Democrática*.

5 It is interesting to note that one of the other societies that exhibit many of the same attributes as the Philippines is Bangladesh, a country also noted for the frequency and magnitude of its hazards (Zaman 1999).

6 In the Philippines, these more culturally specific forms of coping practices are often talked about in terms of concepts such as *bayanihan*, *pakikipagkapwa*, and *pakikisama*. While these terms are often used interchangeably to denote forms of common association and shared identity, the emphasis is subtly different in each case (Jocano 1999 and Bankoff 2004).

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Worsening Floods around Northern Manila Bay, Philippines: Research-Based Analysis from Physical and Social Science Perspectives

K.S. Rodolfo, F.P. Siringan, C.T. Remotigue and C.B. Lamug

Paradoxically, flooding continues to worsen on the heavily populated and highly cultivated deltaic coastal plains around Manila Bay, even during the current period of reduced rainfall. In Pampanga Province, volcanic sediments from the 1991 Pinatubo eruption have clearly enhanced flooding by clogging stream channels, but long before 1991 this area was already experiencing increasing flood frequency, magnitude and duration. Furthermore, the adjacent areas of Bulacan Province and the Metro Manila's coastal KAMANAVA suburbs received little Pinatubo debris, but are also increasingly flood-prone.

Urbanization and deforestation are important causes of the worsening floods but, in the long-term, rising local sea level is the primary factor. This is not the 2 mm/y rise induced by global warming, for regional subsidence is much more rapid. Deltaic muds naturally "autocompact" after deposition: under their own accumulating weight, water is squeezed out, they thin, and the surface subsides slowly. Dewatering and subsidence are greatly accelerated by heavy extraction of groundwater for fishponds, farms, and the rapidly growing population. Annual subsidence of several centimeters measured at many Pampanga well-sites has been independently confirmed by recent geodetic resurveys. Social research refines and enriches our physical dataset by tapping and quantifying the regional population's long-term experience of both storm and tidal flooding. Sociological data regarding floods and tides from 53 sites indicate regional subsidence of 3-8 cm/y since 1991.

Hidden underground and slow, subsidence escapes attention and allows gradual, short-time fixes for worsening floods. Perhaps only a worst-case deluge from simultaneous high tides, storm surges and rains will educate the people and bring about proper mitigation. Government efforts favor short-term political contingency over efficacy. Local politicians build wells to court votes; most national leaders are unaware of subsidence, and foreign engineering consultants ignore, deny or minimize the importance of subsidence. Expensive, ineffective dredging and diking projects, funded with foreign loans that stipulate the use of foreign expertise and ignore Filipino scientists, are vulnerable to corruption. People whose only assets are ancestral homes and lots are reluctant to recognize that their own wells are a major cause of flooding. They demand engineering solutions, but make them even more ineffectual by refusing rights-of-way. Flooding can be ameliorated in the short-term by restoring channel widths and modifying aquaculture. Reforestation would increase infiltration and decrease erosion and siltation. Rapid subsidence will persist if groundwater use is not considerably augmented by surface sources. Even so, flooding from both natural compaction and global sea level rise will continue. Adaptive solutions must be implemented, either ad hoc or by enlightened land-use.

INTRODUCTION

Manila Bay is bordered to the north and northeast by the deltaic plains of many rivers that drain Bataan, Pampanga, Bulacan, and the northern Manila suburban area called KAMANAVA, an acronym derived from the names of the Kaloocan, Malabon, Navotas and Valenzuela (Fig. 1). The region's highly developed agri- and aquaculture make it both a "rice and sugar basket" and "fish basket." Except for Metro Manila, which also relies heavily on surface sources, artesian springs and groundwater from shallow and deep wells are the main source of fresh water for domestic, recreational and industrial uses, fishponds, and, to a lesser extent, rice fields.

Worsening floods in this region have been drawing much attention over the past decade. Since the 1991 Pinatubo eruption, flooding has been enhanced in southwestern Pampanga, where channels have been choked with great amounts of eruption debris brought down by lahars (flowing slurries of volcanic debris) and more dilute runoff. Long before 1991, however, the area was already notoriously flood-prone and was already experiencing increasing flood frequency, magnitude and duration. Furthermore, coastal Bataan, Bulacan and KAMANAVA, which received virtually no Pinatubo sediment, are also suffering from aggravated flooding. Clearly, factors independent of Pinatubo are more important. The more widely cited of these include the various effects of unchecked urbanization: decreased infiltration and increased runoff due to expanding pavement; encroachment of channels by informal settlers and fishponds (Nippon Koei 2001); and choking of streams by improper garbage disposal (Orejas 2000). Upland deforestation also contributes, by increasing runoff, slope erosion, and channel filling.

Only recently (Tacio 1999a, 1999b) have the Philippine public and decision makers begun to recognize that global warming is causing worldwide sea level rise to rise about 2mm/y (Turekian 1996, Mimura 1998, Pirazzoli 1998, Mimura and Harasawa 2000). They have yet to accept that northern Manila Bay is subsiding more than ten times faster, like deltaic areas are all over the world where water is being pumped too quickly out of the ground. Planned and proposed flood-mitigation measures, which include multi-billion-peso dredging and diking projects, ignore or minimize the subsidence phenomenon, and thus could well be futile.

Our study of the role of the different factors that contribute to worsening floods and subsidence began in the Pampanga portion of the coastal plain in 1998, funded by the Center for Integrative and Developmental Studies of the University of the Philippines (Siringan and Rodolfo 2001:1-5). Our continuing research on the entire bayhead region integrates physical and social approaches and has been funded since 2001 by the Department of Agriculture (Siringan and Rodolfo 2002a). The humanitarian organization Oxfam Great Britain—Philippines has provided funding for supplementary research

and for disseminating our findings to local governments and non-governmental organizations (Siringan and Rodolfo 2002b). This report summarizes our physical findings and our social data. We examine trends in population growth insofar as they might reflect how the communities on the plains might be responding to enhanced flooding. Lastly, we discuss the physical and anthropogenic factors that worsen the flooding, propose avenues for continuing research, and suggest several measures that could mitigate the problem.

Geology, geography, and climate

The flood-prone coastal lowlands constitute almost 3,000 km^2 of the southern central valley of Luzon Island, from the Pampanga communities of Angeles City and Arayat town in the north, to the coast that stretches eastward and southward from northeastern Bataan to KAMANAVA (Fig. 1). To the west, the area is bounded by volcanic rocks of the eastern Zambales Mountains, including Mount Pinatubo and its two dormant sisters, Mts. Natib and Mariveles, which form the Bataan peninsula. To the east, the plains abut the Sierra Madre Mountains. Geophysical data and exploratory boreholes show that deltaic and shallow-marine sediments and sedimentary rocks more than 7 km thick have accumulated over the last 24 million years (Bureau of Energy Development 1986).

The coastal plains are so flat and close to sea level that the 1 meter elevation extends 10-20 km inland, and so even small rises in relative sea level translate to large encroachments of the sea. Marshy and cut by numerous tidal inlets, the more seaward flats are almost entirely converted to fishponds that continue to encroach northward and occupy larger portions of channels. Areas still above tidal influence are planted to two annual rice crops. Paddies are converted to fishponds with the progress of saltwater intrusion, which already extends more than 20 km inland in some places.

Manila Bay tides are predominantly diurnal, with a vertical range of 1.25 meters. The highest spring tide of record, 1.93 meters, was set on July 4, 2000 (Nippon Koie 2001), during a period of sustained monsoonal winds (unpublished NAMRIA records). By an unfortunate combination of coastal configuration and seasonal winds, the same southerly and westerly airflows that deliver the annual rains also pile up seawater at the western coasts, temporarily raising sea level and hindering storm runoff from draining seaward. Empirical data regarding the extent of wave setup and storm surge are very few – a great lack; however, surge can easily raise tide heights by 80 percent (Siringan and Ringor 1998), and twice, during typhoons in 1972 and 1976, waves superimposed on storm surge lifted and drove sea-going cargo vessels aground on the breakwaters of Manila's Roxas Boulevard (Brand et al. 1979).

Rainfall is distinctly seasonal, about 70 percent arriving during the rainiest months of June through September, when southwesterly monsoonal winds bring in maritime

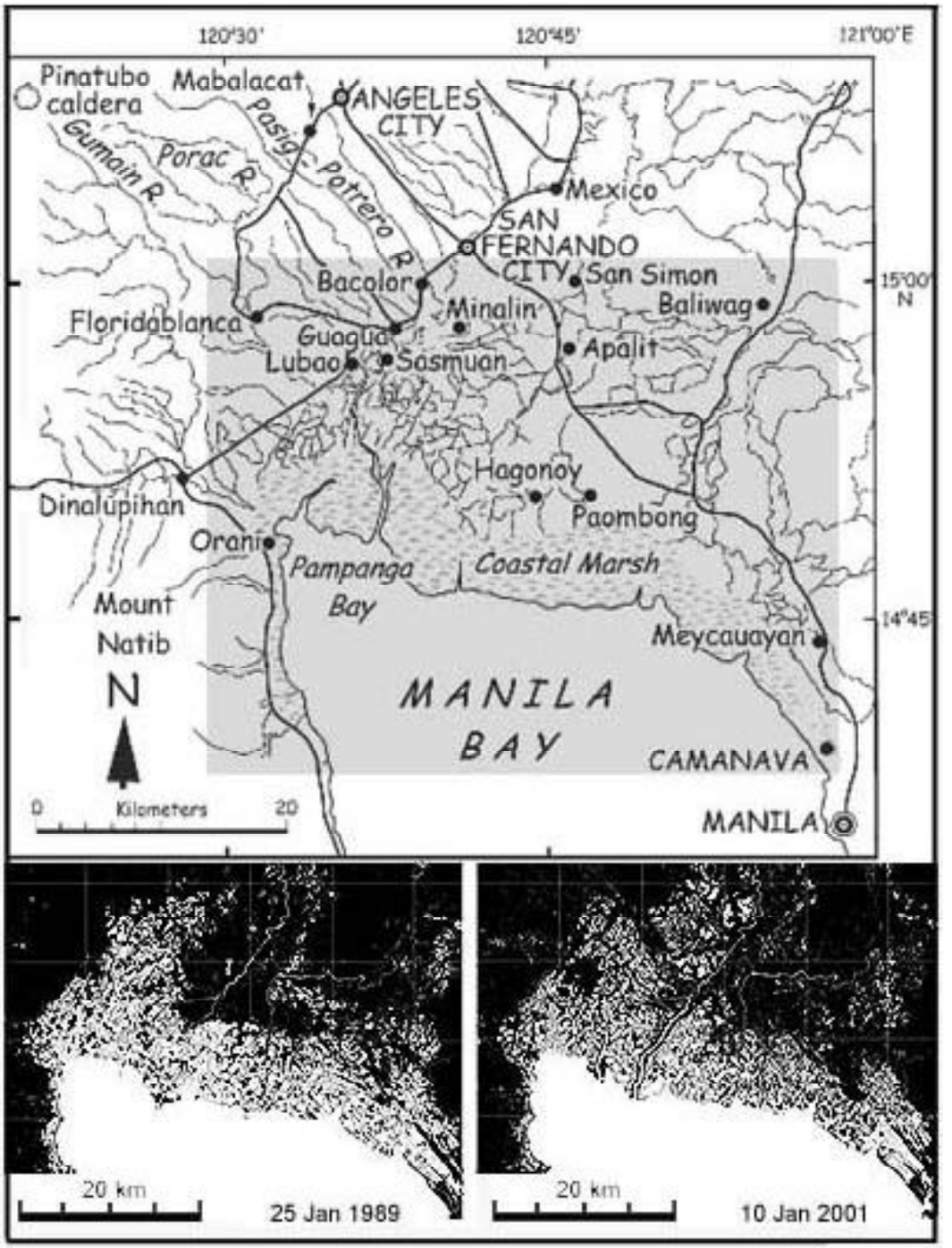

Figure 1. Location Map of the Area Around Northern Manila Bay

equatorial air from the South China Sea. The most intense precipitation is brought directly by three or four annual typhoons, and by southwesterly airflow enhanced by more distal typhoons, about 17 of which enter Philippine space every year. Typhoons and typhoon-enhanced monsoonal flow is responsible for about half of all the rainfall (Umbal and Rodolfo 1996). Annual precipitation varies greatly in the region, depending upon whether or not an area lies in the lee of the Zambales Mountains and Bataan peninsula. Thus, San Fernando City receives only about 1,900 mm, whereas Manila receives more than twice as much, typically in excess of 4,000 mm (unpublished NAMRIA records).

It is a great pity that such an abundance of rain is so seasonal, and that surface reservoirs are too small to store enough water for the agriculture, fishponds, and domestic needs of the regional population, which must rely far too heavily on groundwater. Two serious consequences are rapid ground subsidence and enhanced storm and tidal floods, the central topics of this report.

North and northeastern Manila Bay receives approximately 1.2×10^{11} m^3 of water from the Pampanga and numerous other rivers. Even before the 1991 Pinatubo eruption, the greatest source of bay sediment, about 1.2×10^6 tonnes annually (JICA 1982) was Pinatubo and adjacent portions of the Zambales mountains, and yet, curiously, the receiving northwestern shoreline, instead of bulging seaward, forms the Pampanga Bay. Since 1991, this part of the shore has been receiving great quantities of volcanic sediment, but the nearshore bay floor has not shoaled appreciably since 1961 (Siringan and Ringor 1998). Clearly, sedimentation is being offset by local subsidence.

METHODS

Physical

Siringan and Rodolfo (in press) have described the physical aspects, methods and findings of our research in detail. A time-series analysis of selected bandwidths sensitive to the presence of water in satellite images (Balboa 2002) has revealed subtle but valuable documentation of how the distribution of waterlogged areas has evolved between 1989 and 2001. Using global positioning systems (GPS), we have gathered precise elevation data at 19 stations, which are expected to yield subsidence data when reoccupied in several years. Sediment cores from 32 stations as long as 10.2 meters are being analyzed for evidence of changing environment. Several regional lineaments defined by drastic contrasts in false-color satellite images are yet to be tested as possible faults using microseismic records and ground-truthing that will include ground-penetrating radar surveys.

Sociological

We augment our physical approaches with social research methods. Information is gathered from area residents in three ways: indepth

interviews of key informants from each *barangay* (village), social surveys, and meetings and discussion fora at which we present and validate our analyses and findings, as well as elicit reactions and responses.

A key informant from each barangay provides community-level information such as locations of emerging water-wells, changes in land use, severity of flooding, and heights and extents of maximum tides. The 1991 Pinatubo eruption was such a dramatic event that it serves well as a historical benchmark with which to gauge changes in flood and maximal tide heights. Each informant is a longtime resident of the barangay with good recall of events, preferably a leader from government, civic, religious, or other nongovernment organizations.

Our survey questionnaires were initially designed, tested and used in Pampanga (Siringan et al. 2002: 58-59), and then modified and applied in Bulacan and KAMANAVA. These instruments were developed from a preliminary list of initial questions that was pretested in Sta. Rita, a barangay in Minalin municipality that is flooded for more than six months of the year. The results were used to refine the survey questionnaire and to develop a guide with which to interview key informants. That guide in turn was pretested in San Rafael Baruya, Lubao, Pampanga, which always is flooded by high tides, and in San Vicente, Bacolor, a barangay previously affected by floods and lahars.

The survey instrument solicits from individual households of selected barangays information regarding the following:

- Emerging well pipes as indicators of ground subsidence; saltwater intrusion; information on wells, including depth, when constructed and/or modified, who constructed them, and the sizes of the population they serve.
- Siltation of river channels
- Flooding histories of the areas, including their heights, durations, and recurrence intervals.
- Changes in inland tidal levels and surface saltwater incursion and attendant changes in vegetation especially along coastal towns.
- Agriculture and aquaculture histories of the areas.

Beginning in Pampanga, municipalities were selected to identify and map the spatial variations of the factors contributing to relative sea level change in the region. Of the 22 Pampanga municipalities, 11 were selected and classified according to: location in noncoastal areas less prone to flooding; flood-prone noncoastal areas; and coastal areas highly susceptible to flooding, these last two being assigned the highest priority. Susceptibility to flooding is fairly uniform in each municipality, and so only two of its barangays were selected to represent it. From each of these barangays, three households and one key informant were interviewed. This methodology continues to be refined, and is being applied to three barangays in Bataan, 15 barangays in five coastal Bulacan

municipalities, and four KAMANAVA barangays. In all, we have interviewed 208 people from 53 barangays. The questionnaire data are still being analyzed using the Statistical Package for Social Sciences (SPSS). Most of the data are nominal, thus, only statistics such as frequencies and percentages were generated.

Some of our most important data are yielded by changes in water wells. Since 1998, in an area of more than 100 km^2 north of Pampanga Bay, local people have reported numerous wells that are rising out of the surrounding ground. We inform them that it is the land subsiding instead. Many wells are indoors; others are provided with box-like enclosures. At such sites, portions of floors or enclosure walls attached to the pipes buckle or shear vertically away from the rest of the structure during subsidence. If homeowners or neighbors can provide the construction dates, it is easy to calculate the rates of subsidence. Other significant information documents subsidence rates from historical changes in flooding and tidal invasion.

RESULTS

Satellite data

The analysis of 1989 and 2001 satellite images by Balboa (2002) shows that the coastal wetlands are now more sharply confined by fishpond dikes that have been raised against rising relative sea level. In northwestern Pampanga, volcanic sediment carried down from Pinatubo by the Pasig-Potrero river has reduced waterlogged areas, by enlarging its alluvial fan on the deltaic flats, and by constructing a cuspate delta about 5 km. long with an area of about 1 km^2 (Balboa and Siringan, in prep.). The Pampanga River, diked after the eruption, has also lengthened its delta to a similar degree. Lahars that have descended along the Pasig-Potrero River since the eruption and buried the town of Bacolor to maximal depths of 9 meters have built up a new swath of dry ground about 2 km. wide and 10 km. long. New waterlogged locations, each a few km^2 in area, have also appeared in Pampanga. Most notably, the area east of the lower Pampanga River, which was freed from Pinatubo sedimentation by dikes built after the eruption, is now waterlogged.

Water-well and road-raising data

Respondents report well depths in lengths and half-lengths of 20-foot pipe. No wells less than 36.6 meters (120 ft) deep display effects of subsidence, but 27 wells seated more than 36.6 meters deep have yielded subsidence rates, typically several millimeters or centimeters every year, averaging about 2.5 cm/y. These rates are consistent with the estimates based on accounts that some areas that stood above tide levels 30 years ago are now frequently flooded almost a meter deep during high tide. Subsidence rates we gathered from emergent wells have been independently verified in 2001 by geodetic engineers of the Department of Public Works and Highways (DPWH), who reoccupied six benchmarks, five of which were

established in the 1950s and one in 1999 (Nippon Koei 2001). We were skeptical about anecdotal reports that roads have to be raised about 0.5 meter annually at the coastal Barangay (village) Batang Segundo in Lubao, Pampanga, until a benchmark that DPWH established there in 1999 confirmed a 0.46 cm/y subsidence rate when it was reoccupied in 2001.

Respondents have reported that roads have been frequently raised in order to keep them navigable during the rains. We need to point out that, unless care is taken to provide the roads with culverts, one unintentional result is to hinder the seaward flow of floodwaters and enhance flooding. Furthermore, most houses and lots along the roads are not raised also, and are seriously flooded even if the road stands above the water.

Enhanced flood and high tide levels reported by informants

Over the 12 years since the 1991 Pinatubo eruption, Bulacan and KAMANAVA residents report, the worst annual floods have increased in height by 0.2-1 meter. Bataan and Pampanga informants reported equivalent increases of 0.3-1 meter. These values yield subsidence rates ranging from 1.7 to 8.3 cm/y. More typical values are between 2.5 and 5 cm/y. In coastal communities, typhoons and southwest monsoons used to trigger floods that typically lasted only about 2 hours, peaking during high tides. Now, tidal flooding sometimes takes an entire day to subside. In the more inland municipalities, even moderate rains almost always cause flooding. High-tide floods already were common 12 years ago in coastal Pampanga, but since the eruption, owing to the choking of waterways by lahars, prolonged flooding has transformed Pampanga's inland municipalities into virtual wetlands. Guagua and parts of Sasmuan and Lubao are flooded for 6 months, Minalin usually for almost 9 months, Macabebe for 3 weeks to one month.

Floods have similarly become more frequent and longer-lasting in Bulacan and KAMANAVA. Closer to Manila, most coastal barangays of Malolos, Obando and Hagonoy floodwaters take from a half to an entire day to subside. In coastal barangays further north, floods take from 2 or 3 days to as much as a week to recede. Inhabitants attribute the worsening floods to siltation and encroachment of channels by fishponds. Pariahan, a small *sitio* (hamlet) in Bulacan municipality just a few hundred meters from Manila Bay, is now permanently flooded by seawater because its seawalls were damaged by typhoons.

Response of the flooding victims

We have presented our findings to numerous gatherings of local government and nongovernmental organizations since 1999, and have learned how difficult it is to convince the local people of the role of subsidence in aggravating the flooding. People are deeply attached to places and communities where they have lived for generations. For many, their ancestral homes and lots are their only assets. The government is too poor

to resettle them elsewhere, and is already committed to expensive engineering solutions — which, although probably ineffective and even dangerous, the desperate flood victims are eager to believe will work.

Understandably, some people are reluctant to recognize that their own excessive, even prodigal use of groundwater contributes to subsidence and the consequent flooding. Part of the difficulty lies in the fact that the process is hidden underground. It is much easier to assign all blame to the many visible causes at the surface, like encroaching fishponds and slum housing, water hyacinths ("water lilies"), and garbage. Many do understand the consequences of excessive groundwater use but having been denied of alternative sources, they have resigned themselves to the worsening situation. Many acknowledge that free-flowing wells must aggravate the subsidence, but fear that a well might not flow again, or might yield dirty water after it is temporarily closed. Others would like to take action, but do not know to whom they can turn.

Unlike an earthquake or volcanic eruption, the worsening floods are gradual, and permit temporary, stop-gap solutions. Optimism is rampant during the few flood-free months, and people want to forget the wet and discomfort. We can only fervently hope that it will take less than a catastrophic deluge to educate the people and bring about proper mitigation of this continuing "slow-motion catastrophe". A worst-case scenario would involve simultaneous record tides raised by long-lasting storm surges and waves and sustained rains like those that caused Luzon's record floods in 1972. In KAMANAVA alone, more than two million Filipinos are at risk.

Population change 1990 to 2000

From 1990 to 2000 the Philippine population grew 26 percent, to 76.5 million, but the five-year rate of increase slowed from 13 percent in 1995 to 11.5 percent in 2000 (POPCOM 2000). The 4.2 percent annual growth rate is exceeded in East Asia only by Singapore's 4.3 percent and those of Brunei and Cambodia, each 2.4 percent.

Philippine coastal plains are home to 63 percent of the country's population, and are also where farming and aquaculture are most extensive. Preeminent among these is the coastal-estuarine region that surrounds northern Manila Bay, which increased in population much more rapidly than the nation as a whole, by 39 percent from 4,907,519 in 1990 to 5,690,861 in 2000 (POPCOM 1990, 1995, 2000). Much of this growth is related to proximity to Metro Manila; of the three provinces, Bataan is the farthest and has the smallest coastal population, only 202,310 in 2000 after growing 28 percent since 1990 (Table 1).

Pampanga's coastal and estuarine population grew from 903,757 in 1990 to 1,082,892 in 2000, an increase of 20 percent. Although large, this rate was only about half that of

Table 1. Population Growth from 1990 to 2000 in Communities of the Coastal Plains Surrounding Northern Manila Bay

the entire region, probably due in large part to the 1991 Pinatubo eruption and its aftermath. The most dramatic decline was experienced by Bacolor municipality, the one most damaged by lahars, which descended down the Pasig-Potrero River. After burial of the town proper to an average depth of 6.5 meters by lahars of 1991, 1994 and 1995 (Crittenden and Rodolfo 2001), Bacolor had lost over 80 percent of its inhabitants, and, despite subsequent returnees, by 2000 had suffered an overall decadal decline of 76 percent. Santo Tomas municipality, farther downstream from Bacolor, suffered from heavy volcanic siltation and lost 11 percent of its population by 1995, but had recovered most of this loss by 2000, presumably because many evacuees returned. Nevertheless, Santo Tomas also experienced a small decadal population decline, -1.5 percent.

It is notable that many of the most flood-prone Pampanga municipalities experienced the slowest decadal population growth, and declined even more during the post-lahar period 1995 to 2000; for example, the Santo Tomas growth of 10.4 percent was anemic by regional standards, and may reflect enhanced flooding. Even more flood-prone are the towns of Minalin, Sasmuan, Guagua, and Masantol, which between 1990 and 2000 respectively grew at rates of only 1.0, 10.5, 10.6, and 14.0 percent. Furthermore, the populations of all these towns, together with those of Bacolor and Santo Tomas, experienced slowing growths between 1995 and 2000.

Proximity of Bulacan to Manila is largely responsible for the extremely rapid growth of its coastal population: 48.4 percent from 1990 to 2000, and 25.4 percent from 1995 to 2000. Strikingly, the notoriously flood-prone and tidally invaded town of Obando lagged far behind all other Bulacan municipalities, growing only 14.2 percent from 1990 to 2000, and only 2.8 percent over the last five years of that period. Other especially flood-prone Bulacan municipalities growing at below-average rates include Hagonoy, Paombong, Bocaue, Bulacan, and Meycauayan.

KAMANAVA is officially part of Metro Manila, but lagged in growth behind Bulacan, mainly because Malabon shrank by 2.5 percent, and Navotas grew only 0.6 percent. It is probably no coincidence that those two metropolitan municipalities are the most flooded by rainstorms and high tides. Between 1995 and 2000, Malabon actually lost population, Navotas had negligible growth, and both Kalookan and Valenzuela experienced sharp declines in growth rates.

DISCUSSION

Our research involved both natural and social science methods. If either approach had been used alone, we would not have attained our most valuable results.

Groundwater, subsidence, and relative sea level

Coastal floods are increasingly bothersome occurrences everywhere

in the world where cities satisfy the water needs of rapidly growing populations by pumping too much water out of the ground, causing the land to subside. Tokyo, Osaka, Shanghai, Bangkok, Hanoi and Jakarta are other metropolises on East Asian deltaic and coastal plains that have experienced this serious problem (Table 2). An excellent correlation has been established between the apparent rise in sea level and increasing groundwater usage in Metro Manila since the 1960s (Siringan and Ringor 1998:29-40, Siringan and Rodolfo, in press).

How intensive groundwater extraction causes land to subside has been understood for a long time (e.g., cf. Lofgren 1965, Poland 1984). Most deltaic river sediment is mud, with lesser layers of sand and gravel. Even without human activity, deltas subside naturally as these sediments continually accumulate. They "autocompact" the accumulating weight over each mud layer squeezes water out of it, compressing it, and causing the surface to slowly but continuously subside, at rates of no more than a few millimeters per year. Autocompaction rates around Manila Bay should be comparable to those observed on the Po delta of Italy (0.75 mm/y — Carminati and Di Donato 1999), and the Mississippi delta in the United States (0.9-3.7 mm/y — Kuecher et al., 1993; average 1.8 mm/y — Penland et al. 1988). Such rates are only of the magnitude of global sea level rise.

The sandy and gravelly layers encased in the thick delta muds are called "aquifers" – Latin for "water bearers" — because rainwater that percolates into the ground is stored in pores between their grains, which are relatively large, and thus easy for water to flow through and for wells to tap. Mud contains much more water than gravel or sand, but its pores are so much finer that water cannot

Table 2. Subsidence of East Asian Cities due to Groundwater Withdrawal

LOCATION	PERIOD	SUBSIDENCE meters	cm/y	Reference
Tokyo, Japan	1900-1976	4.6	2.7	Yamamoto, 1984
Osaka, Japan	1934-1968	2.8	8.2	Yamamoto, 1984
Shanghai, China	1921-1965	2.63	6.0	Shi and Bao, 1984
Hanoi, Vietnam	1988-1993	0.1-0.3	2-6	Nguyen, 2001
Manila Bay, Philippines	1991-2003	0.2-1.0	1.7-8.3	This paper
		0.3-0.6	2.5-5.0*	
	1962-2002	**average 3.0**		
Bangkok, Thailand	1980-1990	0.5-1.0	5-10	Anonymous, 2001
	2001		1.5-2.2**	
Jakarta, Indonesia	1991-1999	0.3-0.8	4-10	Abidin et al., 2001

* More typical values

**After raising taxes on groundwater

flow through them very easily. If, however, water is pumped out of an aquifer faster than it can be replenished by natural percolation, the pressure is reduced in the aquifer, which forcibly sucks water out of the surrounding mud to refill its pores. In effect, over-usage of groundwater can speed up natural compaction and subsidence by an order of magnitude. It is important to note that dewatering of clays and resulting subsidence are irreversible. Water-well data from Pampanga document that subsidence rates over the past 30 years commonly exceeded 3 cm/year. If subsidence from groundwater withdrawal is the only significant mechanism that caused the rise in relative sea level since 1991 indicated by our sociological data, it has accelerated to as fast as 8.3 cm/y.

It is important to recognize that groundwater use by individual families may not be the greatest producer of land subsidence. People complain that their domestic artesian wells stop flowing when large-volume pumps start up to irrigate large plantations or when fishponds are flushed and refilled. As our work has expanded from Pampanga eastward into Bulacan and KAMANAVA, we have become aware of the great quantities of groundwater that are extracted for fishponds. A current aquacultural practice is to provide the fish with too much feed. What is not eaten is consumed by bacteria, which use up the oxygen dissolved in the water. Effectively poisoned, the water is flushed into the sea – deteriorating the environment of free-living species to the detriment of Bay fishers – and replaced with great quantities of groundwater. Many fishponds have been illegally enlarged by encroaching into tidal channels and are guarded by heavily armed private armies, and so we cannot measure the pumped volumes. To be assessed and regulated, this usage would require government action, backed by court injunctions and troops, if necessary. In the meantime, we can only speculate that fishpond pumps may cause as much land subsidence as it does in the Yun-Lin area of Taiwan, where extensive fishponds use so much groundwater that they have caused the land to subside 0.66 meter from 1989 to1997 (Liu et al. 2001), causing an 8.2 cm/y subsidence rate. Either coincidentally or significantly, that rate is virtually equal to the maximum 8.3 cm/y our sociological data yield for Bulacan.

Large volumes of groundwater also are used for the recreational purposes of the well-to-do. Golf courses and swimming pools are maintained by groundwater during the dry seasons, and regulations of these activities are also not enforced.

Government response

Our research has obvious relevance for the Department of Agriculture, which seeks to anticipate and adjust to rising regional sea level with timely and efficient land-use planning. Other government responses at both the national and local levels have been disappointing. Indeed, to woo and reward voters, local politicians actually enhance the subsidence by needlessly proliferating

wells. Driven by the three- and six-year electoral cycles, government efforts seem to favor short-term political contingencies over efficacy, and largely consist of "palliative" measures — soothing the anxious public by displaying measures that actually accomplish little.

An excellent case in point is the "Third River" flood-control channel in Pampanga (Nippon Koei 2001: 1-1- 8-1). Designed to alleviate the chronic flooding in Guagua, Lubao and Sasmuan towns, the channel was positioned in an area known by the Japanese and other foreign consultants to be flooded during maximum tide. Worse, it follows very closely the locus of fastest subsidence that these consultants measured and mapped for DPWH (Siringan and Rodolfo 2002). The project was approved and initiated long before Filipino scientists outside of DPWH learned of such details.

The most benign interpretation of why the channel was thus situated precisely where it would be least effective could well be the correct one: that this inappropriate site is the only one the landowners will permit. Local authorities often complain that the national government planners do not consult them sufficiently (Rodolfo 1995: 262), and is frequently remiss in remunerating the owners of the property that it expropriates by power of eminent domain (e.g, cf. , Lacuarta 1993). Owners resist, and political pressures come to bear. The Third River project has encountered public demonstrations, news-paper accounts of outraged citizenry (Cervantes 2001, Orejas 2001a) and angry legislators (Orejas 2001b). Armed citizens may even confront field engineers. A political settlement may be arrived at (Orejas 2002), but only at the expense of the ability of the project to accomplish its physical purpose. Rights-of-way owners are least reluctant to lose land if it has already been devalued by flooding and tidal invasion.

The project must go on, however, because interests other than those of hazard mitigation come into play. While still in office, President Joseph Estrada, a foremost authority on Philippine corruption, reported at a conference in Seoul that government projects routinely lose 20 percent to graft and corruption (Marfil 1999). That figure is over and above the 10 percent that Philippine law allows project proponents in congress to claim as finders' fees. The money appropriated for the Third River project was about a billion pesos (Orejas 2002, Roxas 2002).

The history of how the government built and maintains dikes to contain the lahars that rains continue to trigger 12 years after the 1991 Pinatubo eruption is instructive (Rodolfo 1995: 203, 291, 299, 302-304). Initially, little effort was expended to determine the properties and behaviors of lahars in order to engineer properly against them. Instead, what appeared to guide the plans was how much money the legislature might be willing to disburse. Dikes thus restricted in expense and quality were built, failed, and were rebuilt, either in original form or with

token improvements in design, only to fail again. Nevertheless, funds continue to be appropriated for their repair (Orejas 2003b).

Containing floods by confining a channel with dikes is a nineteenth century approach that in the new millennium is being questioned and successfully opposed in developed countries. Decision makers in developing countries have not yet learned that the practice ultimately is counterproductive in two ways. First, it at best can only postpone floods. It traps sediments that raise the channel bed, thus requiring that the dikes be raised again and again. This can go on only so long; at some point, if they have been raised to the limit, or if funds for repair are lacking, a hundred-year flood will top and breach them, releasing floods of catastrophic magnitude, like the 1993 Mississippi Valley disaster in the United States. Second, the sediments trapped in the channel are denied to the floodplains that are intrinsic, vital parts of the river's domain and ecology. If not tampered with, deltas slowly build seaward because the sediment that floods normally deposit on the floodplains more than compensates for the loss of elevation from autocompaction and subsidence. Ironically, building dikes to prevent flooding arrests this natural compensative process, and thus in the long run contributes to flooding.

Another expensive project of doubtful efficacy is the project designed to protect KAMANAVA both from storm and tidal flooding, a complex of polder dikes, river walls equipped with flood-control gates, and pumps. The project is being funded with Japanese loans that burgeoned from P2.15 billion in 1998 to 3.9 billion in 2002 (Cruz 2002) to P5 billion in 2003 (Nocum 2003), a growth that likely reflects ad hoc planning, and could well project even higher ultimate costs.

The designers plan to pump out floodwaters during low tides, but sustained southernly winds can raise sea level significantly for days, rendering the structure not only ineffective, but quite possibly enhancing the hazard by giving to the endangered an undeserved sense of security and complacency. Furthermore, plans for another ongoing DPWH project produced by the same consulting firm (Nippon Koei 2001: 2-6 – 2-8, T-1) report that Manila can experience southerly wind speeds exceeding 220 km/h (34 m/s), and waves 3.7 m high have been recorded at Manila's port. Typhoon winds and waves historically have been so severe in Manila Bay that the U. S. Navy declared it an unsafe haven during typhoons:

> During [typhoon] Patsy, which passed over Manila [in 1970], high winds and seas sank 21 fishing boats near the North Harbor. Larger vessels dragged anchor or broke loose. Six of them were driven aground or smashed against Roxas Boulevard … [Typhoon] Ora repeated this tragedy a few years later [in 1972], when another six oceangoing vessels were swept into the breakwater (Brand et al. 1979: 297).

For the KAMANAVA project, the Japanese consultants released a "Final Report" on 28 August 1998 (Konekahara 1998), an "Interim Report" almost four years later (Kin 4 May 2001), and a "Sectoral Report" dealing principally with soil mechanics dated August 2001. None of these documents mention the energies and durations of typhoon winds, the sizes, energies, and durations of the surges and storm waves they generate, or the construction details that give the structures a chance of containing, or even surviving, such conditions.

To protect the northern KAMANAVA area that is already at or below mean sea level, the plans include a polder dike 8.6 km. long, composed only of earth, standing only 2.1 meters above mean sea level. Even discounting storm waves, surges driven by typhoon winds can raise sea level temporarily to overtop this height. The 2001 Sectoral Report acknowledged 2.57 cm/y of subsidence resulting from groundwater use. Even though that figure probably is already too low, a rate of only 0.65 cm/y was incorporated into the design to minimize the role of continuing subsidence and its implications for future maintenance costs. Responding to criticism (Orejas 2003a), a DPWH official and a consultant denied the contents and omissions of their own reports and insisted that their designs had taken storms and waves into account (Nocum 2003, *Philippine Star* 2003).

Learning about mistakes the Japanese made in building their own Kansai International Airport may help counteract an unfortunate Filipino tendency to accept foreign expertise too uncritically. The airport was built on an artificial island in Osaka Bay at a cost of 17 billion U.S. dollars and opened in 1994. The planners projected it to sink about 11.6 meters in 50 years. It took only six years to do so (Yamaguchi 2000).

We must point out that subsidence and aggravated flooding from groundwater use share the root cause of so many other Philippine problems. Along with increasing deforestation, soil erosion and lethal landslides, garbage disposal, over-crowded classrooms, joblessness, and, to the detriment of the Filipino family, the increasing economic reliance of the country on overseas workers, it stems from rapid population growth. Given the national fondness for children and lack of political will to limit population size, all such problems can only be expected to worsen inexorably.

Regional population statistics (Table 1) may already be reflecting the environmental deterioration of the region. Overall five-year Metro Manila growth has slowed down from 18.5 percent in 1995 to 5.1 percent in 2000, and it is widely felt that the quality of life there, particularly in coastal areas, is being worsened by flooding. The most flood-prone communities that display sharply declining or even negative growth include Malabon and Navotas in KAMANAVA and the towns of Orani in Bataan, Obando in Bulacan, and Minalin, Sasmuan and Guagua in Pampanga.

SOME RECOMMENDATIONS

Reducing groundwater usage

Abuse of our groundwater is the most serious cause of increased flooding and demands our most urgent attention. Barring a successful campaign to reduce population growth, the only remedy is to drastically curtail its use. Two approaches are indicated: First, land subsidence would be slowed to whatever extent groundwater is replaced with surface sources. The region is entirely bordered by mountains, on which small dams could be built to store water, both in surface reservoirs as well as underground. On the family level in other places in the world such as Bermuda, the roof of every house is built to funnel all rainwater into cisterns.

Second, if groundwater is to continue to be a major source of water, it must be protected by proper, regulated use. A good Water Code and Implementing Rules and Regulations were promulgated by the National Water Resources Council decades ago (NWRCP 1979), but its requirements are virtually ignored, beginning with the first one: drilling permits. They dictate that pump users must consider the possibility of "mining" and its other bad consequences besides land subsidence. Mining – drawing out more water than the environment can replace — sucks progressively deeper wells dry as it lowers the water table. In coastal areas, it causes "saltwater intrusion" — it draws in salty groundwater from beneath the ocean that permanently poisons the freshwater aquifers. The Water Code requires that free-flowing groundwater be conserved with valves, and even specifies how far apart wells can be spaced depending on how much water is drawn from them. One change would be necessary, for the code exempts wells shallower than 10 meters. The topmost sediment layer usually is the most waterlogged and the most easily dewatered and compacted, and shallow wells are great in number.

To be successfully implemented, the code must limit wells to a reasonably small, enforceable number, properly run and regulated by local governments. People would have to pay for water piped from such sources, but appropriate payment for this fundamental resource would engender respect for it, and its conservation. Bangkok was able to reduce its subsidence from 5-10 cm/y to about 2 cm/y because the principal wells were industrial. The politico-economic solution was to raise taxes on wells until it became cheaper to import surface water (Government of Thailand 2001: 46).

In a just world, efficient regulation properly would begin with the most prolific and wasteful users, but fishpond owners, and those who enjoy the use of resorts and golf courses, are wealthy and influential.

Before successful regulation, education; people should not only be encouraged and exhorted to conserve groundwater, but also empowered to do so. For example, there is some

justification for the fear that turning artesian wells off and on may soil the water, or permanently divert the flow to other wells. New wells can be equipped with gravel packs to avoid those problems (Driscoll 1986: 438-427), and research is needed to determine if existing wells can be retrofitted with such devices.

Other long-term flood-mitigating measures

For the better known causes of flooding, the answers are also well understood, easily stated, but difficult to implement. The nation must stop using waterways as garbage dumps and housing sites. Original channels widths must be restored where illegally widened fishponds have been choking them. Floodwaters should be allowed to occupy larger floodplain areas, as nature has intended.

Reforestation is very important in the long term. Upland forests reduce and delay runoff by increasing infiltration, which also replenishes the groundwater. By protecting the soil, they reduce erosion and siltation in lowland channels; further, if the runoff from the uplands are carrying less sediment than they are capable of transporting as they arrive at the coastal plains, they will erode and unclog the waterways during floods. If any of these measures are to be effective, they cannot be performed town by town or even province by province. Nationally coordinated efforts are needed because part of the flood problem in the coastal lowlands lies in provinces not affected by the flooding, for example, those with deforested slopes.

The greater part of the Philippine population, residing on coastal plains, is squeezed, figuratively, between the two jaws of a vise: its own rapid growth, and the subsidence and flooding generated by its own use of groundwater. Other coastal areas that could be experiencing the same phenomena include Lingayen Gulf, Davao, and Agusan.

We may take bleak comfort in realizing that subsidence from groundwater over-usage is a process that is self-enhancing at present, but must be self-limiting in the future, even without proper regulation. As the growing population continues to extract excess amounts of groundwater, subsidence, and attendant tidal incursion and storm flooding can only get worse. Eventually, however, either or both of two consequences will force the exorbitant use of groundwater to slow down. First, the groundwater may be so depleted, or so contaminated by saltwater intrusion that its use will have to stop. Secondly, subsidence and attendant tidal and storm flooding may render portions of the coastal plains no longer habitable, which would also result in reduced pumping. In the end, though, whatever subsidence has happened will be permanent, because the dewatering and compaction of clays is an irreversible process.

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How should Disasters be Managed? The Government's View on Community-Based Disaster Management

Arnel Capili

While a disaster can strike an entire nation, its impact is felt most at the community level. It may strike one or several communities at once. It is these communities which constitute what Carter refers to as 'disaster fronts' (1991: 40). Despite the fact that they are hardest hit, communities have the capacity to respond to threats. They are not passive recipients of aid. In fact, they have the capacity to support themselves. Wenger, writing about community response to disasters, submits that '[c]ommunities can be viewed as problem-solving entities' (1978: 18). It is for this reason that communities should be involved in managing the risks that may threaten the welfare of their members.

Community, according to Hess and Adams, is a 'group of people, who create relations based on trust and mutuality, within the idea of shared responsibility for well-being' (2001: 24). 'Shared responsibility' connotes collective action towards achieving a common goal. In the context of disaster management, the idea of community participation is taken to mean a group of people looking after their most vulnerable members.

An organized community certainly has its advantages. By using what is available locally, it can facilitiate a timely response which, in turn, can spell a difference in saving lives and mitigating the loss of property. The process of organizing also enhances the openness of those involved towards voluntarism, enabling the community to reduce its dependence on either the local or national government in times of disaster.

A HIGHLY CENTRALIZED DISASTER MANAGEMENT SYSTEM

The Philippine Disaster Management System is large and complex. It is fashioned after the military command structure, which is characterized by top-down and logistics-centered responses. The system is highly bureaucratic and frequently operates under explicit or implicit political constraints that impinge adversely on the effective delivery of emergency services.

This is ironic considering that Presidential Decree 1566 (Strengthening the Philippine Disaster Control Capability and Establishing the National Program on Community Disaster Preparedness) provides for a decentralized approach towards disaster management. Laigo (1996) contends that the way policies laid out

in PD 1566 regarding disaster preparedness, sustaining the capacibility for organizing, and permeating the government set-up with a developmental disaster management philosophy, are implemented accounts for its weakness.

PD 1566 explicitly states a policy of self-help and self-reliance during times of emergencies. It is also quite clear that "each political and administrative subdivision of the country shall utilize all available resources in the area before asking for assistance from neighboring entities or higher authority." However, local disaster management systems are still dependent on the national government because some, if not most, local governments do not have the capacity or the resources to manage the threat themselves.

Take for example the conduct of immediate lifesaving measures. Local governments do not have the capability to effectively carry-out these operations either because of the absence of a trained personnel or inadequate resources. More often than not, both constraints hamper effective rescue operations at the local level. Hence, the conduct of such operations has become the purview of the Armed Forces of the Philippines, the national government agency with trained personnel and the necessary equipment for immediate mobilization.

Is the present centralized set-up efficient? Commentators in the field disaster management suggest that an effective disaster management strategy should veer away from reliance on outside intervention because it is not always efficient and tends to encourage dependency (Anderson and Woodrow 1989, Gledhill 2001, US OFDA 1998, Quarantelli 1997). Efficiency as oppose to effectiveness is more concerned with the process. Quarantelli differentiates efficiency and effectiveness, the former "requires that the results be obtained in the best possible way" while effectiveness 'means that a desired and intended result has been produced' (1997: 43). For example, a response operation by the military may have effectively evacuated a sizable number of victims from an endangered area but it may not have been efficient in its use of resources, the time consumed or the problems generated.

THE NDCC AND CBDM

The National Disaster Coordinating Council (NDCC), the highest policy-making body in disaster management in the country is aware of the need to develop a more sustainable approach to managing disasters. One of the approaches it has considered to ensure sustainability, efficiency and effectiveness in disaster management is the use of a community-based disaster management (CBDM) approach.

This desire by the NDCC to adopt CBDM was articulated during the "First National Conference on Community-based Disaster Management in the Philippines." From January 28-30, 2003, the NDCC and the Philippine

Disaster Management Forum jointly organized a three-day conference workshop convened to provide a forum for disaster managers and stakeholders from government, nongovernment organizations and the private sector to share experiences and good practices as well as address urgent challenges in the implementation of CBDM.

CBDM principles

This Conference clarified the principles behind CBDM. At the heart of the approach is the concept of participation. Most of the conference delegates agreed that communities should not be treated as passive recipients of aid but rather as problem-solvers. By encouraging participation, people's capacities are used and developed.

So why CBDM? Quite understandably, it is the people at the community level who have more to lose because they are the ones directly hit by disasters, whether these be major or minor calamities. They are among the most vulnerable to the effects of disasters. Long before outside help arrives, they are the first to respond to the emergency. Under the circumstances, the best way to help communities is to make them better prepared to cope with emergencies.

Focusing on CBDM is also important because the people and groups in the communities have a deeper understanding of the nuances of their geography and history. They intimately know the ins and outs of their locality. Thus, they are in the best position to articulate their needs and decide on what is best for their community.

These premises lie at the heart of the CBDM's plea for community participation. Through this approach, the people's capacity to respond to emergencies is increased by providing them more access and control over resources and basic social services. By building confidence in the community through people's involvement in other development initiatives, the approach encourage individuals in communities to work together, increase their social capital, and achieve high levels of cohesion and cooperation. In so doing the CBDM empowers communities to confidently rely on themselves for disaster preparedness and mitigation measures.

OCD: Towards a more participative disaster management approach

The Office of Civil Defense (OCD), a bureau under the Department of National Defense, has been tasked to serve as the operating arm of the NDCC. It's primary mission is to coordinate, at the national level, the activities and functions of various agencies and instrumentalities of the national government, private institutions, and civic organizations devoted to public welfare. This is necessary to ensure that the facilities and resources of the entire nation is utilized to the maximum for the protection of the civilian populace and property in times of calamities.

The OCD is mandated to perform the following functions:

- establish and administer a comprehensive national civil defense and civil assistance program;
- formulate plans and policies for the protection and welfare of civilian populations in times of war or other national emergencies;
- estimate the material, manpower and fiscal requirements of carrying out the civil defense program; and
- allocate to provinces, cities and municipalities such aid and facilities, materials and funds as may be made available from the national government.

THE PARADIGM SHIFT

As mentioned earlier, the OCD as part of the national defense establishment replicates a military command structure. Its organization reflects a command and control approach towards disaster management. This approach according to Heijmans and Victoria is typical of a "traditional" or "dominant" approach where attention to the disaster response is focused on the hazard and the disaster event itself (2001: 4). The corresponding disaster management strategy is to provide immediate relief through government aid and assistance.

The overarching and central role assigned to government is not an ideal response as it amplifies the weaknesses of communities. First, there is lack of flexibility because the power of local communities is limited to plans developed and implemented by higher levels of authority. Second, it promotes dependency, making the community incapable of dealing with the uncertainty and complexity of disaster-related decision-making. Third, the ambiguous delineation of roles among government agencies involved in disaster management results in an wasteful overlap in functions.

It is important to note, however. that while CBDP is a correct approach, mobilizing local communities poses a challenge. People themselves do not recognize the importance of their involvement in planning and decision-making process, not to mentiojn the dependency that is sometimes encouraged by outside agencies that support communities.

Cognizant of the growing evidence of inequities fostered by centralized disaster management interventions, the unsustainability of top-down programs and their irrelevance to the specific local needs of vulnerable communities, a paradigm shift is apparent. The OCD is shifting more attention to community-based approaches to disaster management.

INSTITUTIONALIZING CBDM

Strengthening the barangays

Participants of the 'First National Conference on Community-based Disaster Management' agreed that a barangay, the smallest political subdivision in the Philippines is a typical community. One way of

institutionalizing CBDM is through the strengthening of Barangay Disaster Coordinating Councils (BDCC). Chaired by the Barangay Chair with members composed of leading personalities, the BDCC is tasked to develop and implement preparedness and mitigation measures for the community. More specifically, the BDCC ought to establish and implement policies and guidelines drawn from the experiences of the city, municipal and National Disaster Coordinating Councils. It is also expected to determine priorities in fund allocation, services, equipment, and relief supplies as well as receives advisory and reports situation from and to the City/NDCC.

The Chair of the BDCC has the following functions:

a) select and train sufficient "emergency operations" members;

b) convene the BDCC as often as needed to effectively implement disaster preparedness planning especially during disaster situations;

c) assess the extent of damage to life and property;

Case 1: Barangay BF Homes: Barangay Calamities and Disaster Preparedness Plan

Barangay BF Homes of Parañaque City has developed its own Disaster Preparedness Plan to avoid panic and unnecessary actions during natural or human-induced disasters.

The aim of the "Calamity and Disaster Preparedness Plan" is to create a synergy of efforts among barangay officials, team members, constituents assisted by government agencies and other organizations in the prevention and/or actual rescue/ evacuation scenario. This serves as an accepted procedure not only for an actual disaster or calamity occurrence but also as a plan to prevent much greater loss of life or damage.

BF Homes is a residential area in Paranaque. It has formed its own BDCC composed of several teams, all having their own responsibilities and tasks based on their capabilities. These teams include the: Communication/Information and Warning Team; Security Team; Supply Team; Transportation Team; Rescue Team; Evacuation and Disaster Relief Team; First Aid and Medical Team; Fire Fighting Team; and Damage Control Team.

The Barangay Calamities and Disaster Preparedness Plan's Implementing Guidelines consists of pre-, during and post-disaster phases. The Pre-Disaster Phase specifies the following actions: the BDCC over-all Chairman shall automatically convene the BC leaders and members for last minute instructions; the Communication Team shall provide all families with warning and information on the kind of dangers to be expected within the next few hours or days as the case may be; the Supply Team carries out an inventory to determine what supplies are needed considering the expected extent of the damages and the duration of the disaster, the Evacuation and Disaster Relief Team identifies and maintains strategic evacuation sites in flood-prone areas, and the Rescue and Medical Teams are on 24-hour stand-by duty during typhoons and heavy rains.

d) assess if there is a need for assistance from other government agencies, private corporations and the business sector; and

e) maintain inter-local coordination with neighboring barangays.

ENHANCING THE VOLUNTEER NETWORK

Another strategy for harnessing community participation and institutionalizing CBDM is to strengthening volunteer networks. The United Nations Volunteers describe volunteer action as 'an expression of people's willingness and capacity to freely help others and improve society' (UNV 2000). Everywhere, volunteer groups are emerging to provide a wide range of services to the community. They can be viewed either as partners of the government in the delivery of services or they can be viewed as parallel organizations to government that fill in where there is inadequacy.

CONCLUSION

The number of natural disasters and emergencies in the Philippines remains almost the same. However, the people's ability to cope with their adverse effects seems to be eroded with time.

It is precisely this situation which makes community in disaster management necessary. Individuals and their communities should be better prepared for impending disasters and more resilient in the future. At the end of the day, addressing people's vulnerabilities and their root causes is key to reducing the negative impact of disasters.

The NDCC through the OCD must realize the need to focus not only on providing immediate relief but also on reducing people's vulnerabilities to future disasters. While it is important to provide immediate relief, the affected population must be given the chance as well to cope should another disaster strike the community. Imparting skills and strategies to community members for them to better cope with hazard will go a long way towards effective disaster management.

It is important to note, however, that communities cannot be expected to reduce vulnerabilities on their own. While they possess local knowledge and coping mechanisms built through years of experience with disasters, their efforts must be complemented by inputs from multiple-stakeholders. In this regard, the NDCC, as the highest policy-making body for disaster preparedness, can play a more facilitative role in ensuring the participation of community members at the local disaster coordinating council level.

The CBDM approach, if adopted as a national policy, will have a distinct effect in reducing the collective vulnerability and insecurity of people affected by disasters.

Case 2: The Barangay Emergency Response Teams-Organized Community Operations Units of the Municipality of Labo, Camarines Norte

The Municipality of Labo is the biggest among the 12 municipalities of the Province of Camarines Norte. It has 52 barangays of which ten are classified as urban and the rest as rural barangays.

Labo is a first class town because of its strategic location in the center of the province and is considered the most populous town. However, it has its fair share of natural hazards that may impinge on its potential for growth and development. Situated in Labo are three inactive volcanoes namely: Mt. Labo, Mt. Bagacay and Mt. Cadig. There are also two major thrust panel lines (faults and earthquake zones) which threaten the northwest portion of the municipality. It is also prone to flooding because of the frequent overflowing of the Labo River. In fact, historians contend that the name Labo did not come from any legal decree but rather from a misunderstanding. A native was said to have been asked by a Spanish Sergeant: "Que pueblo eso este?" (What town is this?) Thinking that the sergeant was referring to the flooding in the area, the native replied, "Labo po ang tubig!" (The water is murky!). And the word stuck ever since, giving a name to the place that resonates with its flood-prone nature.

In response to these threats, the municipality organized a village level emergency response team, the Barangay Emeregency Response Teams-Organized Community Operations Units or BERTs-OCOu. The acronym BERTs-OCOu is actually an attempt to associate the name to the local chief executive, a common practice in the Philippines. This imaginative approach to giving names has both its strong and weak points. On one hand, it ensures that the local chief executive assumes ownership of the project which is a good strategy to ensure that it is funded throughout his term of office. Conversely, as its name is attached to a particular politician, the sustainability of the project often depends really on the person sitting at the helm. This is its weak point.

BERTs-OCOu is a community- based volunteer group organized and trained as a quick response mechanism of the barangay before, during and after the occurrence of a disaster. In fact, BERTs-OCOu serves as the response arm of the BDCC. It is specifically tasked to assist the BDCC in warning and evacuating threatened communities. Moreover, the BERTs-OCOu helps the BDCC in hazard mapping and contingency planning.

The volunteer group is organized at the *purok* and is composed of one team leader and 12 members from each purok or block. Each team is monitored by a Barangay council member assigned to that block by the BDCC. Volunteers of BERTs-OCOu are given training on disaster management concepts, first aid techniques, water and fire safety, vulnerability and hazards mapping and contingency planning.

Through this program, the municipality has become aware of the willingness of its constituents to participate in any disaster preparedness or mitigation activitiy provided that they are given proper orientation on the importance and relevance of the program to their daily lives and their collective future.

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Community-Based Disaster Risk Management: Gaining Ground in Hazard-Prone Communities in Asia

Zenaida Delica-Willison

Amidst vulnerable conditions, it is the communities' natural tendency to protect themselves from the harm and danger posed by various types of hazards, be they natural or human sourced or a combination of both, that can spell the difference. If only there were ways to go back in history and rebuild communities away from natural and technological hazard areas- seismic, coastal, mountain slopes, urban centers- and plan the use of land better, then there would be a big chance of ensuring public safety and healthy socioeconomic life. But the reality is that most poor communities in Asia are located in these vulnerable areas. Therefore it is imperative that hazard-prone communities strengthen themselves and become robust so that they are not only "disaster resilient" but "disaster resistant" communities as well. The purpose of this article is to examine how some communities have managed risks by developing their internal social capital and collaborating with external resource to strengthen themselves. How do these communities introduce and sustain measures for reducing their vulnerability to natural and technological hazards? What are the good practices and lessons learned that could be replicated in equally hazard-prone areas in other developing countries that have many vulnerabilities?

INTRODUCTION

The last decade showed the growing recognition of the need for shifting paradigms from emergency management to disaster risk management. This involved the change of focus from emergency response to planned activities that would mitigate or prevent disasters. At the national and state level, this approach necessitated political will and the formulation of new policies and resource allocation measures to institutional mechanisms that support risk management activities. It is at the local level, however, where development planning and implementation of specific disaster risk management activities takes place.

Experience highlights the importance of local communities as it is an acknowledged fact that whatever the scale of hazards, big or small, it is the local community that either suffers the brunt of or survives from hazards' devastating effects. Since the population at the local community is the one affected, it inevitably becomes the first responder to manages the emergencies at the household and community levels. By managing emergencies well, communities prevent their escalation into full-blown disasters. But more than this, local communities have the potential power to take risk management measures long before hazards strike. In this light,

disaster risk management is most appropriate and relevant at the community level.

Though communities may have many commonalities, no two communities are alike. However, lessons from one community may be studied and applied to other community settings. Some lessons in Cambodia cited in this paper such as "not underestimating local knowledge", "using existing community groups", "tapping external resources but not letting money drive proposals", cooperation, coordination, networking, linking solutions with the community needs and priorities are mostly a reiteration of the best practices found in other parts of Asia. Similarly, the Lao experience of developing and promoting environmentally sound and socially acceptable warning systems while addressing food insecurity is worth looking into for possible application in other equally flood-prone communities. Partnership between NGOs and the national government in assisting communities in Laos is a good example of working collaboration that should be emulated elsewhere. India, too, is a good model for other state governments. Here, the government initiated Community-based Disaster Risk Management (CBDRM) and acted as a facilitator in organizing disaster management committees and in the formulation of community contingency plans. On the other hand, there are also new developments such as the "use of hazard mapping" in risk assessment that have proven useful for organizers but as yet have been of little value to community members. In this case, facilitators need to rethink what tools are appropriate for particular communities.

In general, though, the experience on CBDRM of hazard-prone communities, in collaboration with NGOs and local government units (LGUs) proves that it has gained ground in some developing countries in Asia. While there are significant gains in this respect, the practice is not yet widespread. Lessons in CBDRM practice need to be studied and examined for possible application. The commitment and support of the national government to encourage and empower all LGUs and communities to undertake CBDRM is still a big challenge for the CBDRM advocates. The task is daunting.

DISASTER DEFINITION: A REVIEW

It is important to review the definition of disaster to put the aim of CBDRM in context. There are many definitions of disasters, but for this purpose let us use the Asian Disaster Preparedness Center's (ADPC) definition. "Disaster is the serious disruption of the functioning of society, causing widespread human, material or environmental losses, which exceed the ability of the affected people and the community to cope using their own resources" (ADPC 1999-2003). This means that when a hazard strikes a community, the normal life of the residents is disrupted, which subsequently results in a crisis or emergency situation. If a community or local government is

able to manage the crisis or emergency without the need for external assistance from other communities or higher order government agencies, the situation remains an emergency and does not become a disaster. Only when a community is unable to manage the crisis on its own and requires outside help, would a situation be labeled a disaster.

There are two levels here: managing the disaster risk before a hazard strikes or the crisis event when the hazard does strikes so that it will not lead to disaster (disaster resistant); and managing disaster-events with outside assistance so that people will cope, adjust and recover easily from the event (disaster resilient). CBDRM addresses both levels.

AIMS OF COMMUNITY-BASED DISASTER RISK MANAGEMENT

The increasing human and property losses from earthquakes, cyclones, flooding and other hazards call attention to proper development planning that would ensure the designing and building of communities in safe areas in the future. However, since it is nearly impossible to rebuild housing facilities and relocate communities to safe areas, what do we do? The answer is to improve the traditional disaster risk management program and planning in communities– mitigation, preparedness, response and recovery—to make them disaster resilient.

Disaster resilient communities are "flexible and elastic". They have the "ability to recover from depression" or "adjust, spring back easily from misfortune or change" (Oxford and Webster Dictionary). Like the bamboo, resilient communities "withstand even the strongest typhoons as it sways with storm winds. It is the characteristics of resiliency that has made us survive three waves of colonization. It is the same resiliency that makes us rise from the ashes of Pinatubo and Mayon, and rebuild our lives from the devastating effects of disasters[1]" (Delica-Willison 1997). This means that communities that are hit by a hazard (which develop into disasters) are able to spring back, resume their original form and readily recover on account of their disaster preparedness planning.

Apart from building disaster resilient communities, CBDRM also aims to promote disaster resistant communities. Such communities are able to prevent hazards from reaching disastrous proportions because their mitigation and preventive measures are embedded in a comprehensive plan that takes every aspect of community existence into consideration—public safety, good health and robust socio-economic life. A disaster resistant community is akin to a healthy person who has the immunity to resist Severe Acute Respiratory Syndrome (SARS) or some other life-threatening viral disease.

This is easier said than done. It requires political will on the part of government leaders to decisively formulate appropriate strategies and provide tactical guidance to lead planners in hazardous areas. An all-

inclusive approach is imperative, participatory (bottom up) and directive (top down). A top down approach may also be necessary to enforce laws and regulations, for example in the area of environmental protection. To aim for a disaster resistant community is to address the vulnerability question, both the structural and nonstructural aspects of society.

The goal of disaster resistant communities is to maintain public safety and safeguard development gains. Disaster resistant communities are difficult to attain by individual communities alone. It would entail involving local governments, that, in turn, would enlist the support of all stakeholders. Donald Geis (Natural Hazards Review 2000) suggests ten inherent principles as core guide in attaining a Disaster Resistant Community.

The need for a holistic and integrated approach, communities that are supported by physical and organizational structures and concerned with the overall workings – functioning, relationship, service, capacity, scale – of all its systems and components.

The redevelopment of existing communities in consideration of the natural and built environment (transportation and communication, social facilities, commercial development, etc.).

- Consideration of the overall context of a larger and integrated process of creating sustainable quality life communities;
- Recognized role of the local government in development planning;
- Respect for the uniqueness and diversity of communities and bottoms-up participatory governance approaches;
- Availability and provision of information regarding effective risk reduction measures;
- Prioritization of disaster risk management and the availaibility of environmental, social and economic opportunities to motivate and empower communities to implement disaster preparedness and mitigation measures;
- Recognition of the basic human right of communities to live as safe as possible from natural hazards;
- The reduction of costs related to natural hazards through the creation of a Disaster Resistant Community; and
- Minimization of human, property and environmental losses, along with the social and economic disruption associated with extreme hazards.

Currently, communities that are involved in CBDRM are in the process of attaining resiliency. A thorough study should be undertaken to examine how far the CBDRM proponents have gone in initiating disaster resistant communities.

CBDRM EXPERIENCES

Why are there so many hazard-prone communities in developing countries? First, communities are physically situated in hazard prone and vulnerable areas: seismic, coastal, mountain slopes, watersheds and urban centers. Second, there is something wrong with the way communities are designed and built in these hazard prone areas. This is evident in many communities in the Katmandu Valley, Nepal (seismic, urban); in Kandal, Prey Veng and Kampong Cham, Cambodia (watershed); in Orissa, India (coastal); in Tongi and Gaibanda, Bangladesh (urban); and in Champasak, Laos (lowland). Most vulnerable communities in the Philippines are located in both rural and urban hazard areas.

Currently, the planning of the above communities are geared towards attaining resiliency and aspiring to become disaster resistant communities. They need comprehensive support from all direction to attain the latter.

Case stories

What follows are a collation of experiences drawn from selected NGOs and local governments working either with communities that have suffered from past hazards or are prone to hazards due to their geographical location and vulnerable conditions. The cases presented in this paper present the experiences of the following ADPC partner agencies: Private Agencies Collaborating Together (PACT), Cambodian Red Cross (CRC) and the International Federation of Red Cross and Red Crescent Societies (IFRC and RCS), National Society of Earthquake Technology (NSET), Center for Disaster Preparedness Center-Philippines (CDP), Orissa State Disaster Mitigation Authority (OSDMA), World Vision Laos (WV), and the National Disaster Management Committee of Laos (NDMC). In addition, this article is supplemented by the author's own reflection on most of the cases.

Empowering communities to mitigate flood risk: The Cambodian experience

The primary natural hazards affecting Cambodia are floods, droughts and fires. Due to its location, Cambodia, one of the poorest countries in Asia, is susceptible to flooding along two major watersheds, the Mekong River and Tonle Sap. Cambodia's traditions of solidarity and trust have been negatively affected by the three decades of internal upheaval and warfare. During disasters, families feel that they can not rely on other families and that they are responsible only for themselves.

PACT, the Cambodian Red Cross and the International Federation of Red Cross and Red Crescent Societies, with the support of the Asian Disaster Preparedness Center (ADPC) jointly implemented the Cambodian Community Based Flood Mitigation and Preparedness Program (CBFMP).

In Cambodia, people expect government and NGOs to provide

emergency response during major calamities. To address this dependence on external agencies, the CBFMP introduced the disaster preparedness concept by organizing and mobilizing volunteers. Chosen from flood prone communities, these volunteers are trained in participatory risk assessment. They are made to organize meetings and facilitate the identification and implementation of community level disaster management activities related to flooding such as repair of dams and dikes; cleaning irrigation ditches, culverts, and water gates; and raising road levels or constructing small bridges. This approach to flood risk management challenges the communities to act concertedly. The program initially covered 5,496 households in 23 of the most hazard-prone villages in three flood-prone districts within three provinces.[2]

The program, while raising the community's awareness of floods, also dealt with livelihood options and making local people understand community dynamics through participatory methodologies. The over-all result was to remarkably increase the capacity of local communities to withstand the onslaught of the 2001 flood. For example, the raised road project in Bang Sang Lech Village in Kampong Cham District reduced the speed of flood onset to the houses further inland, provided elevated ground for the safety of the villagers and their livestock and provided road access. Their experience of the flood in 2001 prompted the community members to plan the construction of higher wells to prevent contamination of water during such events and the building of safe areas for families. The people in each village are proud of what has been attained and acknowledge the ownership of the project's outcomes. They also realized that the benefits are not limited to times of disaster. For example, the raising of roads and the construction of bridges provided a reliable transportation route and increased accessibility, allowing children to travel to school and traders to transport their agricultural produce to local markets. New, enlarged or rebuilt culverts increased the community's control over the water flow, enabling them to increase their rice crop yield, and, for some communities, even harvest a second crop. The community-based effort also enhanced community cohesion. "As we completed our project, our community becomes closer. This is something, I have not seen for a long time" (Mr. Peng Eourn, a 63-year old villager from ADPC 2002b).

These communities have the potential to become disaster resistant communities, if given more support in their efforts to address major flood risks. However, the cooperation of the Mekong River Commission and other stakeholders in the major watershed areas of the Mekong Delta and Tonle Sap and the involvement of local governments in those areas are necessary to actualize this potential.

The imperatives drawn from the Cambodian project include the following:

1. Do not underestimate local capacity. During the risk

assessment, the people offered an array of ideas, resources, and local knowledge that resulted in ownership of the results. Identifying solutions to their problems by themselves, they became dedicated to the implementation of these solutions with minimal assistance from outside.

2. Use existing community groups to assess the organizational structures currently operating in communities. These local organizations, be they traditional, civic, homeowners, religious offer viable structures to handle disaster risk management activities. If they can take on the added responsibilities of managing disaster risks, then, they should be part of and incorporated into the project design. In this regard, it is important to be inclusive of different organizations so as to ensure the broad base participation of the community.

3. Communities may tap external funding, but they should not allow money-driven proposals. The most common problems for community-based solutions are financial constraints. Where flood preparedness demands are greater than the financial resources available, it is necessary to train and mobilize local agents to seek funding from outside the community with their counterpart in the form of labor or local materials. The program has allowed communities to generate resources for their flood preparedness through networking.

4. Sustainability requires the cooperation of all stakeholders. Traditional community structures were devastated during many years of civil strife, thus communities need assurance from other actors. A disaster risk management program should bring government and interested non-government and community-based organizations to the table early in the project and work with the community to develop long-term relationships with them. There is a bigger probability that the community will pursue preparedness measures when more stakeholders are involved and when other people are willing to assist the community in developing new activities that may need external support. Gain the support of local authorities and respected individuals within and beyond the community. In this respect, it is important to make activities credible.

5. There is a need to focus on linking solutions with the needs and priorities of community members. Solutions identified to mitigate floods resulted in many benefits. While they may have been intended to reduce vulnerability to floods, they also improved livelihood, enhanced safety and eased access to important facilities and resources.

6. Disaster risk management should be promoted. The promotion of

preparedness activities within the community for awareness raising and internal support and to neighboring communities for replication is important. Use community festivals and other events to promote activities.

7. While risk mapping is a valuable tool, it is not the panacea to all problems of hazard identification. Hazard mapping, conducted during the project provided more value to the organizers/facilitators than to the community. The community members found the mapping a waste of their precious time since they knew the areas most prone to flooding based on historical knowledge and therefore did not need the mapping exercise to determine those areas. However, hazard mapping can serve as necessary information for outsiders who desire to assist the community. It is also a tool to mobilize and sensitize the community and preserve its collective memory of the past events.

8. Project implementation should be sensitive to timing. It is crucial to ensure sensitivity to work patterns, religious rites, and festivals in the communities. Community calendar of activities and events can help.

Pioneering initiatives in managing earthquake risk: The Nepal experience

Nepal is located in a tectonically active region of the Himalayas and has a history of destructive earthquakes. Over 11,000 people died from earthquake-related disasters in the twentieth century alone. Despite its history, the rapidly urbanizing Kathmandu valley, with its uncontrolled population growth and unplanned development and constructions continues to violate building codes that take earthquake risks into account. This makes the Valley highly vulnerable to the hazard. The 1934 Bihar-Nepal earthquake damaged 40 percent of the buildings including many historic sites. (UNCRD 2003) To date, the country is ill prepared to face the consequences of an earthquake because of the "many other urgent matters experts worry about.[3]"

As a response to this situation, the ADPC through its Asian Urban Disaster Mitigation Programme and in cooperation with its national partner, NSET, launched the Kathmandu Valley Earthquake Risk Management Project (KVERMP). This is a three-tiered initiative: local community, national and international. The program conducted training and media campaign about disaster preparedness. A newspaper article that featured joint training by international and national organizations (Lutheran World Federation, United Mission to Nepal and NSET) in a community (Ward 10) led another community (Ward 34) to take action. This interest guided Ward 34 to a six day disaster risk management workshop, participated in by community residents and Committee members, local government officials, CBOs and NGOs.[4] This workshop was a major breakthrough in a society where many

people adopt a fatalistic view of disasters.

KVERMP also initiated a school safety program after a detailed vulnerability assessment of 643 public schools in Kathmandu. The use of participatory methodologies led to the growing interest of communities and the support of school and government officials.

As regards the strategy of Ward 34, the workshop led to the formation of the Ward 34 Disaster Management Committee (DMC), the setting up of a Disaster Management Fund to receive voluntary contributions and to community planning. The DMC conducted a household vulnerability survey and provided further training to ward residents and students. CBOs prepared hazard maps, with technical guidance from NSET. The hazard maps and other outputs were useful in raising awareness, identifying other problems aside from earthquake such as flood, fire and environmental degradation. Maps also served as good input to planning structural mitigation.

The school earthquake safety program employed community participation as an essential component in assessing schools, raising awareness and in selecting schools for piloting earthquake resistant buildings. The program strengthened selected school buildings against seismic hazards for demonstration purposes.

The pioneering initiative in Ward 34 integrated disaster risk management into over-all planning. It included the community's concerns for the poor conditions of roads in its vicinity that impeded quick response to emergencies; the, improper disposal of waste; poor drainage that induce flooding, as well as poor sanitation and health systems that increase peoples' health vulnerability in the aftermath of floods. Furthermore, the DMC removed a dangerous pole erected in the middle of a narrow street in the Ward. Its DMC has also conducted disaster awareness sessions in schools. With positive outcomes from the project, Ward 34 received requests from other neighboring Wards for assistance in hazard mapping and in the conduct of workshops. At present, Ward 34 dreams of establishing a resource center with information, research and training components. Meanwhile, it is raising money to promote awareness of CBDRM among 4000 students, the construction of embankments along the Bagmati River, and the reconstruction and retrofitting of earthquake resistant buildings – Ward Office, schools and hospitals in Kathmandu Valley.

The process of strengthening school buildings has developed into an integrated program resulting in a training curriculum for masons, guidelines for community disaster preparedness and planning for teachers, parents and students. The retrofitting and reconstruction process, in turn, stimulated awareness raising activities.

As for the lessons identified, the following are worth noting:

1. Create ownership of the community-based risk management project as early as possible;

make effective use of community events; involve key people with high credibility; set up an advisory committee to increase transparency, credibility and outreach; and including awareness-raising in every activity. From the very start, the officers and residents of Ward 34 owned the idea of establishing a DMC. This ownership led to commitment, complemented by demand from the community.

2. Second, it is also important to promote sustainability by building capacity and media outreach. The ownership of the project and demand for involvement in it in turn was met by capacity building in risk assessment, implementing mitigation measures, raising funds, etc.

Rising from the ravage of a super cyclone: A state initiative on CBDRM – Orissa, India

Poverty coupled with recurrent natural hazards makes the State of Orissa one of the most vulnerable in India. While the coastal districts are prone to floods and cyclones, the western districts experience frequent and severe drought. It is also prone to earthquake. The 1999 super cyclone that hit the coastal areas left in its wake 10,000 deaths and damaged houses, livestock, crops infrastructure and to the environment (UNCRD 2003).

The experience from this disastrous event resulted in a drastic change in the way the government and people manage risks, prompting the Government of Orissa to form an autonomous organization called Orissa State Disaster Mitigation Authority (OSDMA). This organization was tasked to look after the reconstruction work and to develop a mitigation and preparedness strategy that would minimize future losses and destruction. The OSDMA recognized the primary role of the communities in confronting and responding immediately to any emergency. Hence, the OSDMA worked with communities to build their capacity and enhance their skills and traditional coping mechanisms. With support from the United Nations Development Programme (UNDP) and Department for International Development (DFID), the OSDMA conceptualized the Orissa Disaster Mitigation Programme (ODMP). The program though mainly initiated at the State level, focused on strengthening communities to combine disaster preparedness and mitigation work with development planning. The program targeted 1,100 villages within ten selected blocks in seven coastal districts.[5]

Intended to address the gaps in preparedness and disaster response that were evident duringt the 1999 cyclone, the programme focuses on reducing social, economic and physical vulnerabilities through disaster preparedness of all local stakeholders. Its key components include the preparation of multihazard disaster management plans at the Block, Gram Panchayat (GP) and village levels, formation of different groups to respond to hazards, capacity building of stakeholders in disaster

management at all levels, and vulnerability reduction through linkages with existing development programs.

Following participatory assessment and hazard mapping, community contingency plans in 1,603 villages in 205 GPs in 10 Blocks were developed. Disaster Management Committees (DMC) at the Block, GP and village level were formed and trained to organize and systematize disaster response at the local levels. Various Task Forces were also organized and trained to manage early warning, search and rescue operations, first aid, relief, medical and housing needs, damage assessment, and psychosocial counseling. The program was successful in putting disaster risk management on the agenda of the local government by integrating it into the development planning process and systems at the Block and GP levels.

Interestingly, the organizational mechanism and preparedness plans have stood the test in actual emergencies wrought by the June 2001 floods and November 2002 cyclone threat. As a result of the positive experience of village residents, the demand for replication of the mitigation and preparedness activities in other Blocks and Districts of Orissa has increased (ADPC 2003).

How did the program integrate CBDRM into the development planning system? It sensitized local government personnel to risk management and included mitigation measures identified in the process of formulating community contingency plans. These measures include construction of schools, which can also be used as cyclone shelters, repair or installation of tube wells, strengthening of weak embankments, the construction of facilities for storing nets and dry fish, and identification of appropriate technologies for safer but affordable building construction. Non-structural measures undertaken were public awareness campaigns, training and registration of high risk groups.

The program has met the basic requisites for organized and coordinated CBDRM from the Block to the GP to the village level. With the end of the program in November 2002, the local structures are expected to institutionalize the implementation and update of community plans

The principal lessons from the CBDRM include the following:

1. Government can initiate CBDRM and act as facilitators in organizing DMCs and the formulation of Community Contingency Plans. While in most cases, CBDRM is initiated by NGOs and their partner CBOs, it was the State Government that instigated the program in Orissa. With resolute commitment to safeguard lives, livelihood and property in the event of hydro metrological hazards, the state took pains to understanding how to work with communities and with other organizations. It followed a participatory hazard mapping at the village level with the formulation of a community contingency plan with the community.

2. The allocation of resources by the government and international donors demonstrated the determination of the State to undertake and support the CBDRM process. Mobilization of resources, including volunteers helped the program cover many villages wihin a short time. In less than two years, it was able to cover 1,603 villages. Time, however, will prove the effectiveness (or non effectiveness) of the DMCs.

3. The integration of disaster management into development planning is easier when the government is involved at the very beginning of the program. The government itself is the chief advocate of the integration process.

4. The basic ingredients for sustainability were present in the project such as the formation of DMCs and Task Forces, the initiation of mitigation activities, and the increased capacity to plan, prepare and respond in the establishment of the structures for coordination. While this was the case, there is still a need to comprehensively assess the CBDRM to identify areas for further improvement.

Living with floods and drought: A new approach in reducing risk in Champasak district, Lao Peoples' Democratic Republic

Due to its proximity to the Mekong Delta, the eastern part of Champasak experiences destructive flooding every few years. The Western half, on the other hand, experiences drought and flash flooding. The worsening environmental condition aggravates the effects of flooding and constantly threatens food security. The flow of relief assistance, while alleviating people's immediate needs, have through the years encouraged a dole-out mentality among the affected population (ADPC Midterm Evaluation Report 2003).

World Vision Laos (WVL) has been working on a community development project in Champasak since 1998. WVL saw the need for a CBDRM to challenge the relief culture and introduce a more proactive approach in dealing with the hydro metrological related problems. In partnership with a government agency, the National Committee on Disaster Management Laos (NCDM) launched a two year project entitled Champasak Community Based Disaster Management Project (CBDM).

The CBDM project is about working with people to learn to live with floods by mitigating their negative and maximizing their positive effects. To attain this, the project sought to develop and promote environmentally and socially appropriate warning systems and community awareness of disaster risks and response options. To address the food insecurity issues, on the other hand, the project promoted agricultural production practices that are more appropriate to the local environment.

Considering the results, it is important to remember that CBDM is relatively new in Laos. It became

evident to WVL that two years was insufficient to effect necessary changes and achieve the sustainability of project outputs and outcomes. However, there are already major accomplishments to cite: hazard mapping, training and public awareness activities had been undertaken in 27 villages. Village Disaster Protection Units (VDPUs) were established, and are now helping communities formulate disaster risk management plans. Community Based First Aiders have been trained in 92 communities while more than 220 farmers were trained in fruit tree cultivation with many families receiving saplings and seeds to address the problem of drought and food security,. About 120 hectares have been converted to vegetable production.

By employing the training of trainers approach, the project helps develop local capacity for sustainability and the efficient use of resources. Training materials are translated into the local language for sharing with other government organizations. Moreover, the active involvement in the project design and implementation also constituted hands-on training for the project team and the communities.

As to the lessons learned, the project's benefits clearly demonstrate the inextricable link between disaster mitigation and sustainable development. The farmers who took part in the dry season crop production are already enjoying the economic benefits from their efforts. Increased production of dry season crops would contribute significantly to disaster mitigation in flood areas through reduced dependency on rice production for livelihood. Furthermore, development NGOs (in this case, WVL) could not ignore the need for disaster mitigation and preparedness since their project staff interact with survivors of disasters on a daily basis.

Forum for promoting CBDRM for safer communities: The Philippines

Consistent with its advocacy role, ADPC launched the Partnership in Disaster Reduction for South East Asia in 2001 with support from DIPECHO. Through this project, ADPC conducted meetings, training and reflection workshops on CBDRM. One of the sustainable national mechanism resulting from this initiative was the formation of the Philippine Disaster Management Forum (PDMF), which has emerged from the February 2002 Reflection Workshop on CBDRM held in the Philippines and participated in by government and non government organizations.

Due to its geographic location, the Philippines experiences all kinds of hazards, some of which result into disasters. As a response, concerned individuals organized the Citizens Disaster Response Center (CDRC) in 1984 to assist the organization of Community Based Disaster Response Organizations throughout the country. This is the basic tenet of CDRC – an organized approach to disasters. Its experiences have been shared with other countries through forums and local and international organizations. In 1999, the Center for Disaster

Preparedness (CDP) was organized by former CDRC board and staff to help promote CBDRM through training and education activities.

In line with its thrust, CDP sought the support of the National Disaster Coordinating Council (NDCC) in sponsoring a nationwide conference on CBDRM, primarily to exchange with both government and NGOs and examine the factors that facilitated or constrained CBDRM.implementation. Between 28 and 30 January 2003, the PDMF, with support from the NDCC, held the first national conference on CBDRM. This was a very important event in the life of CBDRM in the Philippines as it was the first time local, national and international NGOs, community based organizations (CBOs), local and national government agencies, academics and business-initiated NGOs came together to learn from each other and address urgent challenges confronting CBDRM. The conference was attended by 82 delegates from various parts of Luzon, the Visayas and Mindanao.

The conference discussed the local and the national situation and assessed the level of CBDM. Cases of communities surviving natural hazards and violent conflicts by supporting each other were presented. It also tackled the different frameworks, models, tools and approaches that the represented organizations utilize. Policies and institutional mechanisms to support CBDM were also addressed. Lastly, the conference talked about ways to advance the cause of CBDRM.

The NGOs and local government representatives narrated positive factors in the implementation of CBDRM. Among them are, the spirit of volunteerism, strong partnership and cooperation among the external agencies and the community, local mobilization of resources, the existence of indigenous knowledge relevant to hazards, capacity building programs and community training, strong NGOs and church support, organized communities, the community and development workers' ability to reflect on past mistake and draw lessons from them; and the funding support of partner international NGOs. In fine, the representatives emphasized the sense of accountability to the people, working *with* local communities and empowering them rather than working *for* them as a key ingredient to success.

On the one hand, they blamed the lack of coordination and proper consultation, low levels of awareness, inadequate funds and bad leadership as constraints. Despite these negative factors, however, the Confrence participants resolved to move forward by taking CBDRM to the level of policy advocacy. They listed recommendations that they will bring to the attention of policy and decision makers so that CBDRM practice can take off. Another conference organized for NGOs was held subsequently to plan the advocacy agenda of the PDMF.

Certainly the lessons from the experiences of the pioneers on CBDM in Nepal, Cambodia, Laos, India and the Philippines can further strengthen the goals of CBDM.

CONCLUSION

No two disasters are the same. Neither will two communities exhibit the same characteristics. However, lessons learned from one community may be tried and adapted to other communities provided that those doing so are sensistive to the nuances of the locality to which new ideas are applied.

The experiences of the different countries presented in this paper show that a top-down approach to disaster management is wanting. Community participation is essential for effective disaster preparedness and response. However, facilitation, organization and mobilization should be managed and supported by organizational structures at various levels—from the grassroots to the national level, to ensure sustainability. Afterall, decision and policy makers at the national level can enhance the impact of CBDRM by providing support mechanisms to upscale it. Moreover, particular top-down solutions need not be inconsistent with community-based approach depending.

At the local level, particular cases reveal the need to seal community and local government partnership through broad based social mobilization and coordination. Investing in the communities' social capital, incorporating participatory disaster risk management into local state development planning and building appropriate management structures are key to the successful implementation of CBDRM. In the final analysis, however, the overall success indicators of CBDRM point to the resiliency of communities during calamities and their ability to resist disasters as the most important considerations.

NOTES

1 It was Jose Rizal, the Philippine national hero who originally compared Filipinos to bamboo in his early writings.

2 These 23 villages are dispersed in the Districts of Kang Meas, Kien Svay and Peam Ro in the Provinces of Kampoong Cham, Kandal and Prey Veng respectively.

3 Roger Bilham of University of Colorado, USA confirmed that a big earthquake should have struck Nepal around 1984, fifty years from the last big one." ADPC, Safer Cities 1, January 2002.

4 Ward 34 is one of the 35 Wards of the Kathmandu Metropolitan City, located in Thimi-Madhyapur Municipality.

5 A block is composed of several Gram Panchayat, and Gram Panchayat is composed of several villages/communities.

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Community-Based Disaster Management in the Philippines: Making a Difference in People's Lives

Lorna P. Victoria

INTRODUCTION

Over the last decade, parallel organizations engaged in mitigating the adverse impact of disasters on human life and property have called for a paradigm shift. Working in different parts of the world, they advocate a change in approach from the prevailing emergency management framework to disaster risk management. In contrast to a reactive, top-down mode of handling disasters that focus on structural and technological solutions, the new approach highlights proactive activities involving local communities that usually bear the brunt of disasters. In this approach, the onus of disaster mitigation lies in the communities. It capitalizes on local resources and capacities to reduce people's vulnerabilities (Maskrey 1994, Maskrey and Jegillos 1997, ADPC 2000, UNISDR 2002).

The Philippines is not new to community-based disaster management (CBDM). Its experience with recurring disasters and a long history of self-help efforts at the grassroots facilitated the adoption of CBDM. After many years of implementation, there is now general recognition that CBDM does work in the country and is an effective approach for reducing disaster frequency and loss. The practices associated with community involvement in disaster management now form part of a rich body of CBDM knowledge and practice here and abroad.

THE PHILIPPINES AMONG THE MOST DISASTER-PRONE COUNTRIES

The Philippines shares with several Asian countries the unwelcome distinction of being among the world's most disaster-prone societies. The Center for Research and Epidemiology of Disasters in Belgium recorded a total of 701 disaster incidents from 1900 - 1991, or almost 8 disasters a year. For the period 1987 to 2000, the National Disaster Coordinating Council (NDCC) recorded 523 disasters or an average of some 37 disasters annually (OCD 2001)[1] with damages amounting to a high Php150.071 billion.

Documentation by nongovernment organizations (NGOs) also reveals local disasters that do not land in national dailies. Aside from such unreported natural disasters, the figures obtained by NGOs are higher than those of the NDCC because they include human-induced disasters like development aggression (development projects which are undertaken against the will of local communities), fire, labor repression, other industry- related events, armed conflict, and toxic waste contamination. The cumulative documented population affected by disasters from 1991 to 2000 is 96,907,837 individuals, which indicates that many Filipinos are repeatedly hit by disasters (CDRC 2000 and 2001).

TAKING ON AN ALTERNATIVE APPROACH IN DISASTER MANAGEMENT

Successive disasters and the most severe economic crises since the end of World War II in the eighteenth year of the Marcos dictatorship revealed the inadequacy of Philippine government response to disasters and the limitations of their technical and reactive stance. This compelled NGOs and people's organizations to promote and develop an alternative approach that highlighted the need to mobilize communities to help themselves and others.[2] The Citizens Disaster Response Center/Network (CDRC/N) was thus born in 1984 to carry out citizenry-based and development-oriented disaster response and preparedness strategies (CDRC 1990).

With successive "mega-disasters" in the last decade and positive case stories of community participation in disaster preparedness and mitigation, more communities, people's organizations, NGOs, government agencies and local government units have adopted CBDM. The Philippine National Red Cross, for instance, has implemented its Integrated Community Disaster Planning Program since 1994. It is now in the course of expanding program coverage beyond the five provinces. Other agencies such as the World Vision Development Foundation Inc., Caritas-Manila, and the Philippine Relief and Development Services have also now integrated CBDM into their existing emergency services. In the government sector, the Department of Social Welfare and Development through its Bureau Emergency Assistance promotes Family and Community Disaster Preparedness in local government units. Among local government units, the municipality of Guagua and the province of Albay are recognized for excelling in local and community level disaster management.

The Philippines held its First National Conference on Community-based Disaster Management on 18-20 January 2003. Jointly organized by the National Disaster Coordinating Council-Office of Civil Defense, the National Defense College, and the Philippine Disaster Management Forum, its aim was to share

experiences and good practices and address urgent challenges.[3] The Conference called for the widespread replication of CBDM beyond the piloting stage (OCD 2003).

FEATURES AND PRINCIPLES OF COMMUNITY-BASED DISASTER MANAGEMENT

Whether a disaster is major or minor or of national or local significance, people in communities are the ones adversely affected. To mitigate the impact of a disaster, they use coping and survival strategies that enable them to respond to the situation even before outside help from NGOs or the government arrives. Having experienced damage and loss, they are interested to protect themselves and are, therefore, open to community-based disaster preparedness and mitigation (AUDMP 2002).

In its report on the activities of the First National Conference on CBDM, the Office of Civil Defense noted that at present there are diverse CBDM practices among various actors and stakeholders such as government and NGOs (OCD 2003). The following key features, which distinguish CBDM from the top-down and traditional aid approaches to disaster management, are based on current practices and experiences:

1. *People's participation*. In CBDM, the community members are the main actors. They substantiate the disaster risk reduction process and pursue disaster management activities. It is important to note that they directly benefit from disaster management and development.

2. *Priority for the most vulnerable groups, families, and people in the community*. While the participation of all sectors in society is needed for disaster risk reduction, priority in CBDM is given to the most vulnerable groups. In urban areas, the most vulnerable sectors are generally the urban poor and informal sector while those in rural areas include subsistence farmers, fisherfolk and indigenous people. Special attention is given to the needs and concerns of children and women (because of their care-giving and social function roles), the elderly, and the differently-abled,

3. *Risk reduction measures are community-specific*. CBDM takes into consideration the particular context of the community. Appropriate risk reduction measures are identified after an analysis of the community's disaster risk (hazard exposure, vulnerabilities, and capacities). Various participatory tools are used to consider people's varying perceptions of disaster risk and solutions to community problems and risk reduction.

4. *Existing coping mechanisms and capacities are recognized*. CBDM builds upon and strengthens existing coping strategies and capacities. Although lacking in material assets, Filipinos can rely on social organizations, shared

values and coping mechanisms such as *bayanihan* (cooperative endeavor), *damayan* (sharing one another's burden), close family ties, the presence of community/ people's organizations and NGOs, and local knowledge and resources. A persevering spirit, being *madiskart*e (or resourceful), and wit and humor are individual and collective attributes which steer the Filipinos through times of crisis.

5. *Disaster risk reduction is linked with development*. Simply put, the aim of CBDM is to reduce vulnerabilities by strengthening the capacities of individuals, families and communities. CBDM seeks to address conditions, factors, processes and causes of vulnerabilities brought about by poverty, social inequality, and environmental resource depletion and degradation. CBDM subscribes to people-centered development as well as equitable and sustainable development. The goal of CBDM is to build safer, disaster resilient, and developed communities.

6. *Outsiders have supporting and facilitating role*. With the community as the main actor in CBDM, the role of NGOs is supportive, facilitative and catalytic. The government's role, on the other hand, is integral to the institutionalization of the CBDM process. Partnerships with less vulnerable groups and other communities are forged for disaster risk reduction.

Closely related to these distinguishing features are the principles and qualities of CBDM programs and activities. They are participatory, responsive, integrated, proactive, comprehensive, multi-sectoral and multidisciplinary, empowering, and developmental. These features also serve as overall targets to work for as well as performance indicators to keep track of in developing and implementing CBDM. Both the process and content of people's participation is important. The process involves community members, particularly the most vulnerable sectors and groups in risk assessment, identification of mitigation and preparedness measures, decision making, and implementation. Participatory tools, mostly adapted from participatory rural appraisal methods are used. The community directly benefits from the risk reduction and development process. Because of the participation of community members, CBDM activities and programs are responsive to their felt and urgent needs. Consideration of the community's perception and prioritization of disaster risk and risk reduction solutions, in turn, leads to ownership.

Although the stress is on proactive measures of prevention, mitigation and preparedness, emergency and recovery interventions are also planned and implemented for an integrated disaster response. Communities are linked with other communities, organizations, and government units or agencies at various levels of the disaster management system,

Box 1. Vulnerability Reduction in the Citizen's Disaster Response Network Experience

The Citizens' Disaster Response Center/Network (CDRC/N) is generally recognized as having pioneered in CBDM in the Philippines. Since its establishment in 1984, the features of its particular brand of CBDM—the citizenry-based development-oriented disaster response, have found applications in other CBDM programs. Taking the position that CBDM should address the roots of vulnerabilities and contribute to transforming or removing structures generating inequity and underdevelopment, CDRC/N puts a premium on people's participation and building the organizational capacity of vulnerable communities through the formation of grassroots disaster response organizations.

CDRC/N's preparedness and mitigation measures are mostly non-structural in nature and directed to capability building such as disaster management orientation, disaster preparedness training, public awareness, community organizing, food security, nutrition improvement, and advocacy. CDRN's Food Security and Improvement Program (FSNIP) enhances the capacity of vulnerable communities to withstand the effects of disasters through food and income sources diversification, increasing access to food supply, and improvement in nutritional status of beneficiaries, especially children.

The village of Ag-agma, an indigenous community in the Cordilleras, Northern Luzon regularly experiences typhoons, drought, pest infestation, and earthquakes. Disaster events have become windows of opportunity for preparing and strengthening community capacities for future disasters. After the conduct of the Ag-agama community profiling workshop using Participatory Rapid Appraisal tools, a two-year community development plan was formulated as part of the FSNIP. Diversification of food and income sources included dispersal of vegetable seeds, fruit seedlings and farm implements, sustainable agriculture training, construction of waterworks, rehabilitation of the community irrigation system, livestock and fish production, and dispersal of draft animals and veterinary medicines. Aside from increasing access to food supply, health and nutrition-related activities included de-worming of children, sanitation campaigns, latrine construction, establishment of village pharmacy and herbal gardens, and medical missions. Training and education activities covered disaster management, functional literacy campaigns, and organizational development support (Morillo 2001 and MRRS 2001).

An evaluation of the effectiveness of CDRC/N's CBDM work by its Core Donors in 1999 concluded: "The key (to effectiveness) is increased self-confidence (of vulnerable communities) through meaningful participation, one of the central elements of the CBDO-DR approach. As a rule, not only the organized members of the community benefit from counter disaster planning, but also the unorganized"(Delica, Marcelino & van der Veen 1999:15).

especially for vulnerabilities that the community cannot address on its own. A comprehensive mix of structural (hard, physical) and nonstructural (soft, health, literacy, public awareness, education and training, livelihood, community organizing, advocacy, reforestation and environmental protection, etc.) preparedness and mitigation measures are undertaken. Risk reduction plans involve short-, medium- and long-term measures to address vulnerabilities.

While upholding the basic interest of the most vulnerable sectors and groups, CBDM considers the roles and participation of all stakeholders in the community who come from various sectors and disciplines. The risk reduction planning and implementation process combines indigenous or local knowledge and resources on the one hand, and science and technology and outside support, on the other. CBDM is an empowering framework which increases people's options and capacities. Vulnerable groups and communities gain more access to and control of resources and basic social services through their concerted action. They enjoy more meaningful participation in making decisions that affect their lives and give them control over their natural and physical environment. Participation in CBDM develops the confidence of community members to participate in other development endeavors. CBDM, particularly in disaster preparedness, mitigation and prevention, thus contributes to achieving development goals by reducing vulnerabilities due to poverty, social inequity and environmental resources depletion and degradation.

PROCESS TO TRANSFORM AT-RISK COMMUNITIES TO DISASTER RESILIENT COMMUNITIES

In general, the goal of CBDM is to transform vulnerable or at-risk communities to disaster resilient ones. While resilience is a new term used in CBDM in the Philippines, community members easily grasp the concept when the metaphor of the bamboo swaying with strong winds yet remaining firmly rooted is used.

Although the steps may vary with different community contexts and organizational mandates, the process for local disaster risk reduction can be generalized as follows (ADPC 2001):

- Initiating the process - community or outsiders may initiate the process. This involves linkage and building rapport with external facilitators;
- Community profiling - initial understanding of disaster situation and orientation on CBDM;
- Community risk assessment - participatory assessment of hazards, vulnerabilities, capacities, and people's perception of risks;
- Formulation of initial disaster risk reduction plan - also called community counter disaster, disaster management, development plan or action plan, and involves the identification of appropriate mitigation and preparedness

Box 2. The Philippine National Red Cross' Social Mobilization for CBDM

Better known for its blood banking and emergency response programs, the Philippine National Red Cross (PNRC) has pursued a proactive and community-based approach to disaster management since 1994 with its Integrated Community Disaster Planning Program (ICDPP). Piloted in Bgy. Bacun, Benguet, Mountain Province, ICDPP now covers five provinces and is in the process of being replicated in other areas.

Its approach involves the formation of a Barangay Disaster Action Team (BDAT) whose members are elected by the community assembly from among sectoral organizations. Usually, the Barangay Captain is also the Chair of the BDAT. The ICDPP provides intensive training for the BDAT who later on conducts the risk assessment and local disaster action planning with community members. In its preparation of hazard and resource maps, the ICDPP uses GPS together with other participatory tools. The BDAT leads the community in preparing the hazard and resource maps and three-dimensional models, but the digitized maps are finalized in the PNRC central office. The technical outputs of the ICDPP are turned-over to the municipal government to help land use planning. The BDAT members also use many popular public awareness materials such as posters and comics on disaster preparedness for problem identification and ranking solutions.

In Bgy. Maasin, Quezon in the island province of Palawan, the BDAT mobilized the community members to solve community problems such as isolation from the town center during the rainy season, lack of health care services, and environmental degradation. The community constructed a hanging bridge and health center and protected the mangrove areas from being converted into commercial fishponds. The community provided the labor while the Red Cross supplied the materials for the construction projects. Technical help in engineering design was given by the municipal government. Since the community identified the project as urgent and its members worked hard to see the completion of the construction project, they continue to manage and sustain them. The hanging bridge took five months to construct and is now used during floods for access to the village center and for children to continue schooling. The village health center has been nominated in provincial and regional competitions for its excellence in service (PNRC 2002 and 2003, CDP 2002b).

measures, including public awareness, training and education activities;

- Formation of community disaster management organization - community organizing and mobilization, capability building in preparedness and mitigation, organizational development and strengthening;
- Implementation of short-, medium-, and long-term risk reduction measures, activities, projects, programs and strategies; and
- Monitoring and evaluation - continuous improvement of community preparedness and mitigation, identification of factors facilitating and constraining success; and documentation of good practices for possible replication.

Within this process, the formation and strengthening of a community disaster management organization are crucial to mobilizing communities for sustainable disaster risk reduction. The community volunteers, disaster management committee, and disaster response organization are the necessary channels for outsiders such as NGOs or government agencies to assist the community. Community groups and organizations are essential to meet the intended aims and targets in CBDM. While NGOs have been instrumental in initiating and facilitating the CBDM process, people's/community organizations and even local government units are now involved in enhancing capabilities for local and community preparedness and mitigation.

BENEFITS OF COMMUNITY PARTICIPATION IN CBDM

In recommending the widespread replication of CBDM in the Philippines, the First National Conference on CBDM in January 2003 underscored key benefits derived from its implementation – enhanced community preparedness, zero casualty, effective response, self-reliance/self-help, optimum utilization of resources, solidarity/ bayanihan, strengthened community organizations, and enhanced coordination and networking.

During the Regional Workshop on Best Practices in Disaster Mitigation in September 2002, similar benefits such as building confidence, pride in being able to make a difference, enhanced capabilities to pursue disaster preparedness, mitigation as well as bigger development responsibilities at the local level were cited. In addition, individual and community ownership, commitment and concerted actions in CBDM, including resource mobilization have produced a wide range of appropriate, innovative and doable preparedness and mitigation solutions which are cost-effective, self-help and sustainable. These have led to empowerment at the individual, household and community levels. With case stories that show and tell that CBDM works, there is now an increased demand to replicate CBDM (AUDMP 2002).

Box 3. Buklod Tao Assists other Communities in CBDM

Buklod Tao is an environmental people's organization based in Doña Pepeng Subdivision and North and South Libis, Brgy. Banaba, San Mateo. After a one-day Disaster Management and Preparedness Seminar in June 1997, Buklod Tao formed a Disaster Response Committee (DRC) composed of 33 members and formulated a Counter Disaster Plan to protect the community from damages due to regular flooding. Three disaster management teams were organized and emergency rescue and evacuation plans were detailed (including fabrication of 3 fiberglass boats using local expertise and labor and practice rescue maneuvers in the river). From the Barangay Council, Buklod Tao was able to secure one life jacket. From other sources, the organization secured funds (around Php 30,000) to purchase flashlights, ropes, megaphones, first aid kits and materials to build three rescue boats. Two months after the seminar, a typhoon hit the community. Although several houses were swept away by the waters, no one was killed and many people were able to save their belongings. Since then, when typhoons hit the area everybody can be brought to safety because of flood-level monitoring, early warning, evacuation, rescue operations, and relief assistance activities of the DRC and Buklod Tao.

Word of Buklod's activities and the benefits of CBDM circulated. Before long, neighboring communities began asking for help in conducting their own training activities and in forming their own DRC. Among the next adherents of CBDM are Brgy. Banaba Extension, Brgy. Ampid, Riverside Libis, R. Dulo, R. Bungad and Pulang Lupa in Brgy. Sto. Niño. The communities all decided to hold disaster management orientations and disaster preparedness training (DPT) in their respective barangays and to eventually form DRCs. Buklod Tao also assisted in the formation of a DRC in the far-flung rural community in Brgy. Calawis, Antipolo City. After the 2-day DPT, the Calawis Community-based Disaster Group was formed. Its initial activities include mobilizing resources to finance and equip disaster preparedness requirements.

Even small benefits and gains from undertaking CBDM motivate the community to sustain the CBDM activities and replicate the CBDM process in other vulnerable communities. Case stories such as the experience of Buklod Tao increase demand for CBDM, with assistance from NGOs, government, and communities themselves (Abinales 2002, Heijmans and Victoria 2001).

SOME WAYS AHEAD FOR CBDM IN THE PHILIPPINES

The experiences of CBDM in the Philippines point to five interrelated requisites for the institution, sustainability and replicability of CBDM at the local and community level as shown in Figure 1. Capability building in disaster management, which cover sustained training and public awareness activities using local knowledge, language and culture, should be supported and undertaken. It would enable communities to increase participation and eventually sustain their own the CBDM activities. Basic to the training is an assessment of the nature and behavior of hazards prevailing in the community, the particular prevention, preparedness, and mitigation measures to undertake, and specific skills in relevant disaster management responses. Among less vulnerable groups including government and NGO policy makers and implementers, capability building should include risk reduction and CBDM framework and methods.

The CBDM training and public awareness activities ought to result in the formulation of a community counter disaster-plan. Alternatively called the emergency/contingency plan, preparedness and mitigation plan, or community disaster management plan, the plan should chart the community's progression towards safety, disaster resilience and

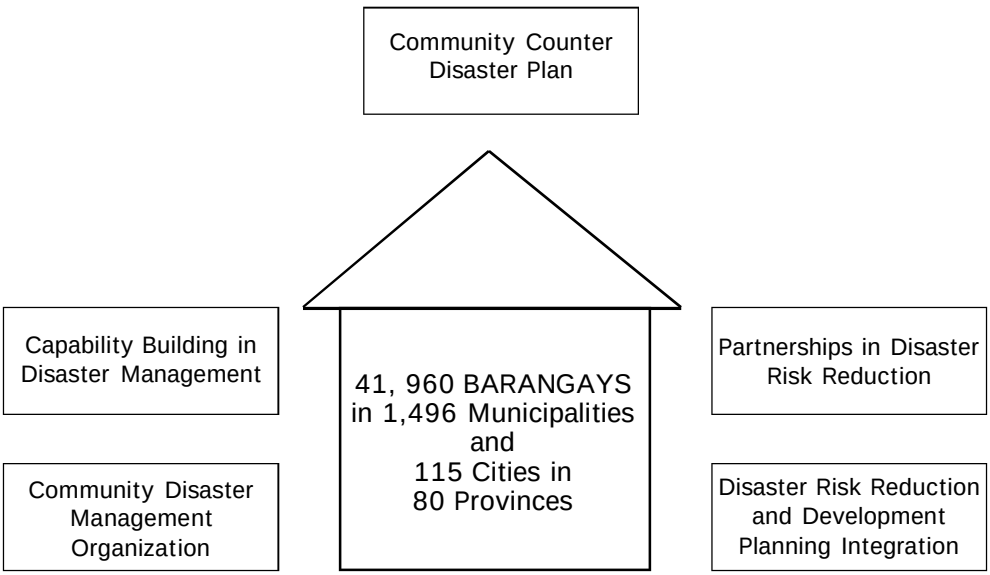

Figure 1. Requisites to Sustain and Institutionalize CBDM

people-centered (equitable and sustainable) development. Doable disaster management activities before, during, and after periods of disaster enhance the community's capacities and reduce its vulnerabilities and disaster risk.

To pursue the implementation of the plan and mobilize the community-at-large in undertaking preparedness and mitigation measures, the formation and strengthening of community disaster response organizations is necessary. The function of disaster management can be integrated into existing community organizations, structures, or volunteer teams. Aspects of disaster management and organizational strengthening should include leadership skills and values formation, studies on sectoral/ community/municipal to national scenarios and burning issues.

The integration of community disaster risk reduction into local development planning systems and processes will lead to sustainable and equitable community development. When there are political constraints, the community should advocate for such integration so that issues of public safety, poverty, employment and livelihood security, housing, health services, education, management of the physical and natural environment or general well-being of the community and public are addressed. Development planning should take into consideration the particular geographical and physical characteristics of the country as well as ensure that policy, programs, and resources contribute to development for all.

Partnerships in disaster risk reduction should be forged between the vulnerable and less vulnerable groups within the community. Community networks with local government, concerned government agencies, NGOs and other communities are needed to implement the CBDM plan, especially for vulnerabilities which the community cannot address on its own. The complementary and concerted action of stakeholders from various sectors, disciplines and levels of the Philippine disaster management and development planning system are needed to achieve safety, disaster resilience, and equitable and sustainable development for all. Although communities have acquired local coping strategies and capacities to reduce some vulnerabilities through the experience of recurring disasters, vulnerability is a complex web of societal conditions, factors, and processes (Anderson and Woodrow 1989, Blaikie et al. 1994, Anderson 1995) which the community cannot untangle on its own. Immediately, many necessary structural mitigation measures involve big capital outlay. Building a culture of safety and disaster prevention entails a lot of commitment and effort, learning and unlearning, doing and undoing, involving all stakeholders.

The First National Conference on CBDM pointed to immediate policy and operational issues in its recommendations to adopt CBDM as a viable approach for reducing

Box 4. Meeting of Top-down and Bottom-up Approach in Capability Building for CBDM in Camiguin Province

The island province of Camiguin was devastated by Typhoon Nanang on 6-8 November 2001. The landslides, lahar and flashflood claimed 220 lives (including those declared missing), injured 146 persons and affected some 7,000 families. Damage to settlements, agriculture and infrastructure was placed at P201 Million. This recent disaster served as a wake-up call to enhance local and community capacity in disaster preparedness and mitigation. The Local Government Units (LGUs) of Camiguin have since April 2002 undertaken the "Enhancing Capacities in Disaster Preparedness, Prevention and Rehabilitation Project" with the support of the Local Government Support Program (LGSP). One of the key strategies for integrated, responsive, proactive and development-oriented disaster management involved the synchronization of improvements in capacity and the systematization of the community and local level with the provincial level (meeting of the top-down with the bottom-up approach or *bibingka* approach). Aside from training workshops on disaster preparedness and disaster management planning, a study tour was organized to Legaspi, Albay and Guagua, Pampanga to share and learn from those best practices in local and community level disaster management. At the barangay level, community organizations and residents participated in the capability building activities.

The municipality of Mahinog suffered the most damages during Typhoon Nanang, and was prioritized for disaster preparedness and mitigation activities. The Community Risk Assessment held in May 2002 in Bgy. Hubangon was attended by 80 participants from all the sitios. During the Disaster Preparedness Training in the first week of July, the LGU personnel and community members realized that when it floods, the water level does not rise all at once, and there is opportunity to issue an early warning so long as a careful watch or monitoring is carried out. Their newly designed early warning and evacuation system was put to an initial test during Typhoon Milenyo in August 2002. Continuous ringing of the church bells and sirens means residents should evacuate to the Chapel and Mahinog National High School premises. The Barangay Disaster Coordinating Council has been reconstituted and is composed of 135 members. Even while "echo" seminars on disaster preparedness have still to be undertaken, the community members already value the barangay counter-disaster plan.

The community level counter-disaster plans were then integrated into the municipal and provincial plans following the DM planning workshop in March 2003(LGSP 2003, CDP 2003a).

disaster frequency and loss: undertake unified and purposive lobbying for an enabling legislation on CBDM; allow use of Local Calamity Fund allocation funds for predisaster activities; institutionalize the Disaster Management Office at all levels of government; empower local officials to declare a state of calamity; integrate disaster management into the government's development planning; take advantage of relief as an entry point for developmental interventions; respect and strengthen existing community coping mechanism and structures; conduct research, training, sharing of information and experiences in CBDM; enhance coordination, cooperation, partnerships and volunteerism; espouse a Code of Ethics of "Do no harm" among DM practitioners; include disaster management in the school curriculum; educate media and donors; base disaster responses on damage and risk assessments; and formulate appropriate standards for relief packs, evacuation centers, and other services.

CONCLUSION

Experiences in the Philippines affirm the relevance, viability and effectiveness of involving communities in disaster management. CBDM, a participatory approach, is making a difference in the lives of Filipino families and communities. However, to sustain, replicate and institutionalize CBDM, the bottom-up approach has to be combined with the top-down approach. Vulnerabilities which are rooted in the Philippines' socio-economic political system and level of development (or underdevelopment) cannot be reduced by communities alone. The higher levels of the Philippine disaster management and development planning system have to support and enable on-the-ground CBDM. To realize the reduction of disaster risk and achieve safety, disaster resilience, and development for all Filipinos, local knowledge, coping strategies and resources, especially in vulnerable communities, have to be complemented with commitment and supportive actions from less vulnerable and multisectoral groups.

NOTES

1 The National Disaster Coordinating Council's monitoring system from 1998 includes minor and major disasters. For the year 2000 alone, 259 disaster events were noted, affecting 9,078,236 persons with total cost of damage of Php 7.739 Billion (NDCC 2003).

2 A debilitating drought in 1983, six destructive typhoons and Mayon Volcano eruption in 1984 wrought havoc to the lives of Filipino communities.

3 Excluding some 22 observers, the Conference was attended by 82 participants from 69 national and local government agencies, NGOs, community organizations, and academe.

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Prevailing over Disasters through People's Organized Action: A Continuing Engagement in Community-Based Disaster Management in Central Luzon

Eugene Orejas

INTRODUCTION

On 11 January 2004 the houses of Adelyn Ramirez and some women in the urban poor village of Baseco in Tondo, Manila were spared from burning. However, the houses of 5,000 families or some 20,000 persons were razed to the ground.

How did those in Adelyn's group manage to save their homes and a few belongings ? They used mud as a fire breaker. This was a common practice in Sitio Depensa, Orion, Bataan, a coastal community in the Central Luzon province of Bataan. But this practice is not known to many and, in the case of Adelyn's group was only rediscovered by necessity and out of desperation. The fire in Baseco, a community of slum dwellers that was always vulnerable to such a disaster could have been averted had the residents been organized and able to put in place community disaster plans that included early warning signals, fire breaks, an evacuation system, resource generation, advocacy and health programs. These are some of the major activities of a Community-based Disaster Management (CBDM) program.

COMMUNITY-BASED DISASTER MANAGEMENT (CBDM)

CBDM is an approach focused on increasing the capability of the communities to reduce their vulnerabilities to disaster events. The framework thus addresses the vulnerability of people on the ground, who are regarded as the main actors in the CBDM program and process. The salient features of the approach include recognizing the existing capacities of victims, encouraging people's participation, putting premium on the organizational capacity especially of vulnerable sectors – they who have less in life and so are more prone to dangers and the adverse effects of disasters. The activities of CBDM are in the areas of disaster prevention and preparedness, emergency response, mitigation and rehabilitation. It is fully integrated into the campaign of organized communities against landlessness, joblessness, and environmental destruction that makes them vulnerable to disaster and renders them less able to cope with its consequences.

Founded in 1986, the Central Luzon Center for Emergency Aid and Rehabilitation, Inc. (CONCERN) adopted and developed CBDM as an approach with a corresponding program in the course of assisting calamity victims. The Mt. Pinatubo eruptions in 1991 and the subsequent destructive lahar (volcanic flows) and floods in its wake provided more opportunities to practice and further refine CBDM.

Implemented on a regionwide scale through a network of people's and nongovernment organizations(NGOs) that are closely coordinated with the government for scientific information and resource management, the CBDM, as advocated by CONCERN has helped save more lives than dole-out type relief operations. Moreover, the CBDM experiences and lessons learned in the Mt. Pinatubo disaster (eruptions, lahar flows, and later floods of much longer duration) has proven the correctness, viability, and empowering elements of such an approach.

CBDM continues to be significant. Given the unsustainable use of the environment and the widespread poverty and unemployment in agricultural and urban areas, the approach needs to take root in more vulnerable communities.

THE CONTEXT OF DISASTERS IN CENTRAL LUZON

The region lies at the heart of Luzon, one of the three major islands in the Philippines. By 2002, it accounted for 8.03 million people or roughly 11 percent of the country's population. Considered the third smallest region in the country with 1.8 million hectares of land area, it ironically has the third biggest population (National Statistics 2000).

Four major volcanoes are also located in the region – Pinatubo in Zambales, Natib and Mariveles in Bataan, and Arayat in Pampanga. Three major earthquake fault systems rock the region in varying intensities. The long stretches of coastline on Central Luzon's eastern and western areas are prone to storm surges, heavy rains, and violent winds from the Pacific Ocean and South China Sea. The basin-like shape of the plain makes Central Luzon naturally prone to flooding.

Mountains outline the region's peripheries with some 771,174 hectares of potential forestland. However, only about 194,500 hectares are actually forested. This lopsided ratio is only exacerbated by the increasing rate of deforestation – estimated at an annual average of 4,000 hectares – that endangers forest wildlife and results in soil erosion and river siltation.

The 1991 eruptions of Mt. Pinatubo emitted some 800 million cubic meters of pyroclastic materials. Washed by strong rains from the slopes into the rivers that wind through the plains, volcanic flows as high as 15 meters drastically altered the region's landscape. Because the rivers overflowed with volcanic debris, the region has lost its natural drainage, rendering it more vulnerable to floods.

Considered one of the world's most catastrophic events in the twentieth century, lahar flows from the eruption buried and left unproductive some 385,000 hectares of agricultural lands, and changed the biological composition of thirteen rivers. Lahar flows have also claimed the lives of 2,729 people in the past 10 years, inundated more than 500 villages and triggered floods that lasted from 30 days to 6 months in the provinces of Pampanga, Zambales and Tarlac. These are the provinces at the foothills of the Zambales mountain range (otherwise known as the Western Luzon Arc) where Mt. Pinatubo lies.

Aside from disasters caused by natural hazards, the region also bears the brunt of numerous human-made disasters or a combination of natural and human-made ones such as floods, droughts, landslides, armed conflicts, development aggression, fires, red tides, epidemics, pest infestations, and pollution.

Despite the region's natural wealth, the lack of employment and livelihood opportunities renders lives no better in Central Luzon that elsewhere in the Philippines. Though the official unemployment rate remains low compared to other regions, millions of the classified "employed" are actually engaged in seasonal and contractual jobs. Added to this is the fact that the daily minimum wage of less than Php230 is less than half of the required Php534 daily cost of living allowance for a family of six.

The region has also lost some 5,918 hectares of farmland to residential, industrial and commercial uses through legal and illegal land use conversions between 1994 and 2001 (PDI 2001). This trend, which remains unchecked, affects thousands of small land-owning farmers and tenants. Then as now, this results in the phenomenon of urban migration.

More than 66 percent (5.3 million) of the region's residents belong to those considered as most vulnerable to disasters. They are the landless/ tenant farmers, workers, Aetas (indigenous people), fisherfolks and squatters. They are the farmers who have no land, no equipment for production, and no control over the domestic market. They are the workers who are underpaid, have no stable jobs and suffer from unfair labor practices. They are the indigenous people who, because of poverty and the lack of access to quality education, do not participate meaningfully in decisions affecting their own lives. They are the fisherfolks and the squatters who are equally poor, homeless and without stable sources of food and income. For these people who are economically unprepared, disasters are simply part of their everyday struggle to eke a living.

Efforts by poor parents to provide education to their children as a way to improve their life status are rendered useless. Even when elementary and secondary public education is declared free, parents have difficulties paying the miscellaneous fees. Without formal education, the ability of their children to comprehend highly technical

information is diminished. They also have very limited access to information through the media. Most of the families in the remotest rural communities do not have television or radio, let alone, access to newspapers. Thus, they are frequently misinformed and thereby prone to wrong decisions or poorly-time actions.

Dire poverty and marginalization have made it difficult for shattered families and communities to rebuild and recover in a way that might make them more resilient to a subsequent disaster. A strong case in point is the plight of the Mt. Pinatubo victims. More than a decade after the eruptions, some 40,000 resettled families transferred to resettlements continue to bear the brunt of the tail-end effects of the disaster (PDI 2001). Displaced from their farms and uprooted from their villages, these families remain in dire straits because resettlement sites are too far from the main towns and cities; there are no farmlots; and there are few basic social services as local governments whose populations have dwindled receive a lesser shares in national revenues. Of all disaster-stricken towns, it is, perhaps, Bacolor in Pampanga that has suffered the most. The construction of a 56-km lahar-catching dike there occupied the site of 18 out of the 22 villages, making the return of these residents next to impossible.

Furthermore, environmental degradation has exacerbated the occurrence and impact of floods, typhoons, and droughts. Rapid urban migration, along with population density, has driven families to embrace more risks. People are driven to erect shanties near major highways or along riverbanks, increasing the risk of mishaps. Traditional coping mechanisms are also eroded when families tend to fragment and disperse in the face of disasters.

CBDM APPLICATION IN CENTRAL LUZON

Concern is a nongovernment organization mandated to render services to disaster victims. Its mission is to assist in developing the capability of the most vulnerable sectors to pursue a people-based development-oriented disaster response (PBDO-DR).

To realize this, CONCERN has worked to form a regional network of people's organization committed to PBDO-DR. It is a network that addresses the vulnerabilities stemming from poverty, economic degradation and ideologically-based armed conflict. It mobilizes resources and rallies its constituency to mitigate the effects of disasters on its victims. It is a network whose understanding of its framework deepens and whose capability for giving life to such a framework develops in the course of actual disaster response. What emerged from this effort were the Grassroots Disaster Response Machineries (GDRMs) organized into a single network that spans the Central Luzon provinces.

As an institution, CONCERN has three programs. The first is the Disaster Preparedness Program (DPP)

which aims to develop the capability of both organized and unorganized communities. The two major components of DPP are Education and Training. These are aimed at raising disaster awareness, building skills in disaster response management and organizing the formation of Grassroots Disaster Response Machineries (GDRMs). The DPP assists in the drafting of Disaster Response Plans through the conduct of Disaster Response Management–related trainings, drills and resource generation at the grassroots level. The second is the Emergency Response Program (ERP). This provides immediate relief services to disaster-stricken communities. Through the program, CONCERN coordinates or cooperates with other organizations, institutions and agencies for relief delivery operations, medical missions, stress-de-briefing sessions, evacuation assistance and rescue operations. Other support services include disaster monitoring, information dissemination, volunteer mobilization, resource generation and advocacy of the victims' plight and related issues. The third is the Rehabilitation Program. This aims to develop a comprehensive and integrated approach to intervention in areas where the GDRM has attained the capability for organized action. Organizing support, skills training, livelihood assistance, and environmental regeneration comprise the program's holistic intervention in the communities.

In its 17 years of operations, CONCERN has evolved from simply a relief institution into a comprehensive disaster management center. This development has passed through several phases or stages: first, a responding-to-actual-disaster events framework from 1986 to 1989; second, a community-based development-oriented framework from 1990 to 1997; and lastly a shift to a people-based development-oriented framework from 1997 to the present.

A. Responding-to-disaster-events framework, a reactive approach

From 1986 to 1989, CONCERN's services included relief operations to 9,433 families affected by typhoons and floods and assistance in the evacuation of 5,215 families affected by armed conflict. In the aftermath of emergencies, CONCERN implemented small-scale rehabilitation projects such as agricultural support (palay seeds and vegetables), credit, children's educational assistance, irrigation and animal dispersal to 1,189 families. In these responses, CONCERN was guided by a framework of "responding to disaster events" instead of addressing the vulnerabilities of the people. Its limitations were:

- The services focused on providing relief services to victims to address their immediate needs and subsequent rehabilitation projects aimed at ensuring that victims were able to cope economically from the effects of disasters;
- CONCERN carried out the emergency response, with staff conducting data gathering, packaging of relief, identifying of beneficiaries and other logistical requirements – the victims were merely recipients of relief goods;

- Small-scale projects were coordinated with people's organizations (POs) without doing an assessment of their organizational and management capabilities, resulting in many POs experiencing difficulties in managing and sustaining the project, and even at times contributing to existing organizational problems; and
- Other sectors were not fully mobilized to help the disaster victims; CONCERN relied mainly on projects funded by international and local donors.

While it cannot be denied that such responses benefited disaster victims, CONCERN realized the strategic limitations of adhering to a framework of "responding to actual disaster events". This framework was found unsustainable and lacking in the values of participation and accountability. As it merely employed a "dole-out" approach, it also overlooked the significance of building the people's own capabilities through disaster preparedness.

B. Addressing vulnerabilities at the grassroots, local, regional and national levels (1990 to present)

In 1990, CONCERN was among the proponents of a national network of disaster response centers to uphold the *Citizen-Based and Development-Oriented (CB-DO) DM* orientation. The CB-DO is premised on the capability building of the vulnerable sectors. It encourages broad grassroots participation and a sustainable developmental approach, which establishes pro-active, holistic and preventive response rather than palliative measures. It believes in the inherent capability of the communities to prevail over disasters. It seeks the realization of organized communities capable of changing their lives, mastering their conditions and charting their future.

It was in the eruption of Mt. Pinatubo that the CBDO framework was tested and developed. First, the people of Central Luzon were unprepared for disasters especially with the magnitude of the Mt. Pinatubo's eruptions. CONCERN's institutional programs were inadequate to serve the thousands of affected people.

Taking up the challenges, CONCERN developed the concept of grassroots disaster response machinery (GDRM). These units are mandated to immediately respond in the advent and aftermath of disasters and address their effects on the community by generating and mobilizing available resources and capacities inside and outside the community. The capacity of the GDRM is built along more comprehensive community concerns and the realization that vulnerability is rooted in the socioeconomic condition of the people. As such, capacity building for disaster response entails socio-economic empowerment.

By 1996 or five years after the Mt Pinatubo's eruptions, CONCERN carried out an evaluation of its practice over the last decade. The result was the adoption of a People's Based

Development Oriented (PBDO) principle to replace the Community Based Development Oriented (CBDO) one. PBDO places emphasis on increasing the capabilities of the most vulnerable sectors and emphasizing that disaster response is not the sole work of CONCERN. Disaster response is actually a movement characterized by people's organized actions aimed at vulnerability reduction.

Organizing communities for vulnerability and risk reduction is crucial in all types of interventions because organized communities can better launch development initiatives. People at the grassroots level have inherent but limited capacity. What they need is to be assisted in identifying their potentials and resources and in formulating procedures to mobilize them. With functional organizations, people can better study their problems, plan out their moves, make use of their limited resources and eventually gain from it.

CBDM PRINCIPLES AND CASE STUDIES*

1. DM work is not only the responsibility of the institution. DM work is an integral part of the cause of people's organizations. Disaster response management can be best pursued when done in collaboration with various stakeholders – people's organizations, support institutions such as CONCERN, individuals and private agencies.

This approach has resulted in the formation of a disaster response network (DRN) at the regional and at the provincial levels in Pampanga, Zambales, and Tarlac. Acting as the secretariat of the DRN in the regional level from 1992 to 1996, CONCERN rendered relief operations to 217,597 families, trained 3,528 people, and provided rehabilitation support to 5,494 families from different sectors. In churches, offices and schools, it campaigned for help and solicited mainly relief items like canned goods, used clothes, mats and other kitchen utensils.

Trained by CONCERN, the provincial networks composed of people's organizations implement the entire DM work through their secretariat. The secretariat unifies the POs on DM orientation. The provincial DRN helps in formulating disaster preparedness plans, organizing GDRMs, disseminating information, delivering goods, conducting resource generation, implementing rehabilitation project and advocating for relief, rehabilitation and resettlement at the provincial and regional level. The concerted effort is effective in addressing the needs of the victims. However, the sheer numbers make the work daunting.

In 1997, CONCERN spearheaded the formation of the Oplan Sagip Bayan (OSB), a national coalition against the La Niña phenomenon in 1998. It comprised a little less than 50 NGOs, church organizations, academic organizations as well as hundreds of individuals. The resources (goods, funds, volunteers) mobilized

by this coalition were directed to relief operations, sandbagging work in immediately threatened villages, advocacies through the media and disaster preparedness training in Luzon, including Dumagats in remote Quezon province. Before the services were rendered, CONCERN unified the coalition to undertake the tasks along the PBDO framework. The OSB continues to render services.

In 2001, CONCERN assisted its partner, the Zambales Disaster Response Network in information dissemination and disaster preparedness orientations in Barangays San Juan, Paudpod, Carael, Batonlapoc and Bangan in Botolan. The threat of lahar flows burying these villages loomed as government proceeded to breach the crater-lake of Mt. Pinatubo and release water that would mobilize lahar downstream. Barangay-level GDRMs were immediately formed with strong linkages to existing community leadership structures. The GDRMs were able to respond to the impending threat of lahar and flashflood. They linked up and conducted dialogues with municipal officials for mitigation measures. The municipal council provided 500 sacks for the sandbagging operation in Barangay Baytan, which was located at the upstream portion of the Bucao River.

At the onset of the rainy season, the GDRMs actively monitored the situation in their respective barangays. They were able to set-up an Emergency Operations Center (EOC) in Batonlapoc. The GDRMs on the other hand, assisted barangay leaders in the identification of evacuation sites and the listing of evacuated families. For lack of funds to provide adequate food assistance and because the worst-case scenario predicted by the Philippine Institute of Volcanology and Seismology did not eventuate (happen), local government advised families to return to their villages.

2. DM work gives premium on organizing the people and building their capability to prepare for disasters. This is the core of addressing people's vulnerabilities. By organizing the people through the formation of Grassroots Disaster Response Machineries, they are given the strength to cope and recover against the impact of disasters, and eventually address the underlying problems of their vulnerability that include poverty, landlessness, homelessness, unemployment, low income and disempowerment.

During the Mt. Pinatubo eruption, a community-based course for Disaster Preparedness and Evacuation Center Management was designed and conducted in 120 communities. The trainings resulted in the formation of 113 grassroots disaster response machineries.

The GDRMs through its warning committee in Manibaug Libutad in Porac, Pampanga – (considered as one of the high risk areas for lahar flows) warned residents that the water level at the creek was rising and that they should prepare for evacuation. They blew their whistles and immediately mobilized the foot patrols that

contacted households. They informed the residents of the impending danger, instructed them to leave their houses and to gather at the marketplace or a school building that had previously been identified during the disaster preparedness training. A few hours later, a one-meter high lahar claimed houses upstream, while lahar of two meters tall buried the houses downstream. However, no one was killed or hurt.

But the GDRM concept also suffered setbacks during its formative years. GDRMs formed without adequate linkage to people's organization that already existed in communities fizzled out after the actual disaster event. To address this, CONCERN ensured that GDRMs were next formed as committees within the PO structure. In areas without POs, the organizational skills of GDRMs leaders were strengthened.

3. In the course of building people's capabilities, DM work initiates advocacy campaigns for the reduction of vulnerabilities and for accessing services. Advocacies for a sustainable environment vis-ŕ-vis local occurrences of deforestation, river siltation, and mangrove destruction were pursued. Advocacies for welfare services include resettlement, relief assistance and rehabilitation (seeds, potable water, etc.) Leaders were encouraged to mobilize their constituents and their resources to generate public opinion or influence local policy-making bodies to effect life-nurturing policies and measures.

The network actively campaigned for the relief, rehabilitation and resettlement of Pinatubo victims. By 1996, the advocacy campaigned against the usufruct scheme in which the victims are required to pay for lots and houses. The scheme was shelved, and in 2003 the government started issuing land titles to the settlers (PDI 2003). However, this process has moved so slowly that it required another campaign to press for the swifter distribution of titles.

4. The program is integrated because it applies different but complementing strategies and approaches at any point within its duration. It seeks to address both the short and long-term needs of communities, assisting in the defense of local resources and environment as the people's livelihood base through advocacies. Concretely, this program is an integration of the three main strategies applied by the institutions namely, disaster preparedness through organizing and training, emergency response, which includes health services, and rehabilitation which includes small-scale and multicomponent livelihood projects.

The project in Masantol, Pampanga began with relief assistance. A year later, the Emergency Response Committee evolved into a people' organization covering ten barangays. It has addressed concerns relating to floods and other problems confronting the communities.

Flooding has worsened over the years in Masantol and in the nearby towns of Macabebe, Calumpit, and Apalit in the aftermath of the Mt. Pinatubo eruptions. This can be observed in the greater occurrence of floods despite moderate rains, floodwater levels that reach an average of two feet after only moderate rains and four feet after heavy downpours, and the occurrence of a longer period of inundation that can last for as long as more than six months. These detrimental developments can be partly attributed to the destruction of the remaining mangrove forests. Coastal villages have been stripped of their natural defense against the battering waves of Manila Bay and rendered more vulnerable to erosion. Through the years, due to salt intrusion and frequent flooding, many people have shifted from rice farming to inland aquaculture to raise prawns and crabs or do a combination of both simultaneously.

CONCERN held relief operations in the ten flood-affected barangays of Masantol in August 2002 in the aftermath of typhoon "Gloria." The project assisted 1,000 families. Because residents were involved in assessing the situation, on who needed help most, what help was most needed, and how this help should be offered, the participatory process led to the formation of a municipal-wide GDRM in Masantol. Even during an emergency response, CONCERN tapped the inherent capacity of the victims. In Palimpe, the Emergency Response Committees held sandbagging activities so that 300 children could resume classes. The initiative paved the way for the local government to cement the sandbagged structure.

The *Sagip Cabalen ning Masantol* (Save the People of Masantol), as a municipal-level GDRM, managed to get five potable pumps after they campaigned for safe drinking water. It also called for dredging to improve the drainage capacity of the river. It launched a *bayanihan* (working together) activity for sandbagging and pushed the town's vice mayor, who heads the local legislative body, to pass a resolution protecting the remaining mangroves.

5. Women's role in disaster management is important and it needs to be enhanced. Being half of the population who take up most of the domestic concerns as their principal responsibility, women have much to share in carrying out community-based initiatives at disaster management. They should be given venues to express and develop their leadership potentials so they can have more significant participation in the development process.

Barangay Saluysoy-Pandayan is a squatter's community along the dilapidated railway in Meycauayan, Bulacan. It is part of the so-called *Daang Bakal*, connected to other communities by a long stretch of railway tracks previously operated for public transport by the Philippine National Railways. The squatters together with the other similar communities in Daang Bakal have been

declared public land and the residents as illegal occupants or "squatters". However, without places to move to, families are forced to remain despite the many threats of demolitions.

The project assisted in the formation of a 'railroad-wide' GDRM with a functioning leadership structure. It conducted a disaster preparedness training attended by 19 selected community leaders. Thirteen (13) of these participants were women (65%). The GDRM conducted contingency planning for disaster response, hazard mapping, dialogues with barangay officials regarding road development and with provincial officials regarding demolition, a community-wide Operation Clean-up, and herbal preparation training. The project also helped form the Barangay Fire Brigade (BFB). The BFB initiated a 12-hour monitoring during the dry months of March until May to prevent any fire hazard. The GDRM gathered resources to support the BFB by providing bread and coffee to members on patrol. There had been several attempts to burn down the community but these have been prevented because of the sustained monitoring of the BFB.

In March 2002, a fire broke out in another squatters' community some 500 meters away from Saluysoy-Pandayan. Overcoming parochial concerns, leaders of the GDRM helped in the rescue and evacuation of some 400 of the affected families. They assisted the local government unit in identifying and preparing evacuation sites. They initiated an appeal on behalf of the affected families for relief assistance. In less than a week after the fire, the GDRM was among the first to conduct relief delivery operation but since the resources were not enough for the 400 families, they prioritized those who were most in need. After CONCERN's relief delivery, other organizations and local government followed.

6. The genuine participation of disaster victims in all aspects of disaster management is at the core of successful intervention. The people are the primary forces or stakeholders whose future relies mainly on their own decision and determination to pursue DM. The actual participation of the people is best expressed in their involvement in decision-making. The role of NGOs is to guide them and unite them around particular principles. Different views should be encouraged to come up with better judgment and resolution on certain issues.

Barangay Sta. Isabel is a rural village in the central portion of Dinalupihan town in Bataan. Considered one of the poorest communities in the fourth-class town, the community is located on a low-lying plain surrounded by privately-owned tracts of agricultural lands that were previously tilled for sugarcane.

About five hectares of the village has been declared under dispute by the Municipal Agrarian Reform Office (MARO). Three different clans claim ownership of this land which is part of a 20-hectare property that had been left idle for two decades. The disputed land unfortunately has been the home

and source of food to 48 families for several years. Faced by the possibility of eviction since 1998, the residents organized themselves and formed the *Balikatan ng Mamamayan (People's Cooperation)* to assert their tenure to the land.

In July 2000, immediately after typhoons "*Ditang*" and "*Edeng*" left Sta. Isabel under four feet of water for several days, CONCERN conducted a DNCA (*Damage-Needs-Capacities Assessment*). CONCERN discovered that more than 20 families that had been evacuated at the height of the typhoons were forced to return because of inadequate space at the evacuation site. After the rains, some of the families chose to remain on their roofs rather than go elsewhere. The urgency of providing food and medicines prompted CONCERN to include Sta. Isabel in the top priority for relief assistance.

CONCERN assisted by helping form a Disaster Response Committee or GDRM, instructing the community in the step-by-step procedure of emergency response, and helping them systematize their operation. The residents organized a DR Committee under the leadership of Balikatan instead of creating another structure. Through the leadership of Balikatan, members of the DR Committee helped CONCERN identify the needs and enumerate the beneficiaries. They also prepared the program and technical requirements of the relief delivery operation.

Through the project, local people gained knowledge and skills on disaster preparedness, health management and herbal plant preparation. They initiated monthly communitywide cleanups of the waterways; procured medicines, rubber boats, life vests and canned foods; and accessed water pumps as a source of potable water.

When typhoons "*Reming*" and "*Seniang*" hit Central Luzon in November 2002, the community was relatively well-prepared. They were equipped with monitoring gadgets, ropes, medicines, rescue/evacuation facilities and a stockpile of canned food. They also identified and prioritized the most flood-prone areas for evacuation. Through these initiatives, the community suffered less from the flood, which remained for three days at the height of the typhoons. Despite the number of families needing to evacuate their homes, no personal property was damaged as these had been earlier transferred to safer places.

Even after the project had ended, CONCERN sustained its support to Balikatan by helping in the campaign to remain on the disputed land. It also supported the local PO on its disaster mitigation campaign concerning a proposed dike system. In June 2001, while the project was in progress, CONCERN designed a livelihood project seeking to improve income. The proposal was submitted to the Small Grants Programme of the New Zealand Embassy. It was approved for implementation in January 2002.

7. Capability building for organizational strengthening and project management is crucial

to project sustainability. Project success cannot always be effectively measured in terms of achieving project objectives as designed but rather in terms of how effectively the local people and their organization have undergone the process of achieving the project objectives.

CONCERN, in line with the PBDO framework developed an Integrated Program for Development (IPD) for Aetas in the upland communities of Batiawan and Malipano in Floridablanca, Pampanga. The IPD, by design, strengthened the capacities of the people's organization through socio-economic empowerment. The program resulted in the reforestation of 10 hectares in upland areas of the villages, the training of 50 adult Aetas in functional literacy and numeracy, and access to potable water to less than 100 Aeta families. Besides the benefits from livelihood projects and social services, the program also facilitated the long-lost unity between the Aetas and the upland settlers against whom they harbored negative feelings as "land grabbers". Through the program, they began to cooperate. Guided by the program, the local PO then campaigned against land grabbing and illegal logging in their communities.

CONCLUSION AND CHALLENGES

The CBDM guided by a people-based development-oriented (PBDO) framework is both comprehensive and integrated. It is comprehensive because it not only tackles the aftermath of disasters as well as their onsets but also the entire range of disaster response work. It gives utmost priority to assisting vulnerable communities to prepare for the onset of any disaster event in the context of addressing their vulnerability and building their capacity to manage disasters. It involves the provision of relief assistance as well as the important task of extending knowledge, skills and opportunities for the resumption of economic activities that can help people rebuild their lives. It is essentially pro-active and is not content with mere stopgap measures or reactive interventions.

But there are challenges as well. First, there is a need to lobby for a government legislation to create an independent body or structure for disaster management. The increasing occurrences of disasters and the dire lack of comprehensive DM work necessitates the creation of that body with year-round work.

Second, it is high time for government and funding donors to give emphasis to disaster prevention, preparedness, and mitigation instead of relief assistance. Actual engagement in disaster management (DM) is hampered by the lack of knowledge and expertise on it. There remains a dearth of development NGOs involved in DM work either through services or advocacy of disaster-related issues. Most NGOs involved in disasters only tackle the relief aspects of the work and there are only a few NGOs engaged in comprehensive DM let alone in the training and development of DM

practitioners in communities, schools, areas of work, and even within government.

Third, the five percent calamity fund should be confined to services such as relief and other preparedness activities. In South Cotabato, the calamity funds were reportedly being used to hire three companies of CAFGU (Citizens Armed Forces Geographical Unit) to fight against the Moro Islamic Liberation Front (MILF). Although armed conflict is considered a human-induced disaster, scarce funds should not be allocated for services that effectively increase the military budget which already consumes a large share of the budget. DM practitioners should look into how local governments use calamity funds (Business World 2003).

Lastly, CBDM should be integrated into the programs of the people's organizations so as to save more lives. These organizations can identify the hazards, mobilize the people, advocate for services and reforms and work with barangay disaster coordinating council (BDCC). To date, the DM networks in the Philippines are still composed of NGOs and private groups.

NOTE

* Taken from materials of CONCERN (n.d.).

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The Psychosocial Impact of Internal Displacement: Case Studies from a Complex Emergency Situation on Mindanao

Kaloy A. Anasarias

In the Philippines, where the prevailing idea of a disaster are those brought about by typhoons, earthquakes and floods, the phenomenon of internal displacement, as a consequence of armed conflict, has already reached a proportion that can no longer be ignored. More than 1 million people have been affected by armed clashes since the government responded with an all-out military assault against Moro revolutionary fronts in Mindanao three years ago. This is nearly as many as those displaced by natural calamities estimated by the Global IDP Project of the Norwegian Refugee Council to be approximately 1.5 million people in 2001. Though the total war policy was lifted by President Gloria Macapagal Arroyo when she became chief executive in 2001, bombing operations and military actions against Moro Islamic Liberation Front (MILF) have produced 300,000 more evacuees over the last four months of this year (2003) in Southern Philippines. According to a report of the US Committee for Refugees (USCR), this places the Philippines on the list of top 40 countries where internal displacement is considered as a great disaster. In Southeast Asia, the Philippines ranks third after Burma and Indonesia as countries with the most number of internally displaced persons.

When disasters such as internal displacement strike, the physical effects are obvious and are the ones usually noticed – loss of life, destruction of home, properties, livestock, workspaces and houses of worship. Too often, the emotional effects of disasters are taken as a normal reaction to a tragedy – which they truly are — but are taken for granted as a passing response to an extraordinary situation. State authorities, government social workers and private service providers seldom consider that even more than the physical effects of disasters, the traumatic effects cause long lasting suffering, disability that impairs the normal and meaningful functioning of individuals, families, and communities.

TRAUMATIC STRESS

But what really happens to a person when he or she goes through a traumatic event such as war and internal displacement? What do the evacuees feel and experience under such circumstances? The story of one

case being served by Balay in Parang, Maguindanao illustrates the experience common to traumatized evacuees who had survived the armed conflict in Mindanao:

- ➔ It was night time when the military attacked. My family was roused from our sleep by the sound of planes and gunfire. Without warning, the bombs fell. Mortar shells rained near our house. We heard shouting everywhere. People were running, wailing. Children were crying. My heart pounded very hard. My mouth was dry. I was stunned, I could barely speak. My body was tensed. My senses were on high-alert. Anxiety washed over my body. Terror gripped my mind. I could hardly move. I could not understand what was going on. All I knew was that our lives are in peril.
- ➔ My parents told me to pick up my younger sister and grab a few clothes. We were moving out to get as far as possible from the sight and sound of war. We walked and ran under the cover of darkness. I could imagine our house being hit by bombs. After two days, we arrived in the town center where many other evacuees had sought refuge in a schoolhouse. We were tired and had not eaten, but I was too shocked and afraid to feel hungry. I could not believe that tragedy could happen to us.

Shock, a sense of unreality, and fear dominate long after the fighting is over. At the evacuation centers the sight, sounds, smell, and feeling of the tragic event persist, leaving an indelibly horrendous image in the hearts and minds of the displaced persons. They grieve for the death of their loved ones and wonder how they survived. Not a few dwell on feelings of guilt for not being able to save their parents, siblings or kin. Others feel devastated by the loss of their homes; for the destruction of treasured personal belongings such as school uniforms, family pictures, pets, for lost documents, and for the loss of friends and familiar neighborhoods.

The extraordinary prevalence of such strong physiological, cognitive, and emotional responses to forcible displacement indicates that these are normal reactions to an extreme situation. The trauma being suffered by internally displaced persons is not a sign of "mental illness" or "moral weakness." They do not signify that traumatized people are going "crazy" or weak. However, unless their psychosocial disturbance is resolved relatively quickly, their distress may interfere with their ability to reconstruct their lives and shatter family and community relations. It may even lead to dysfunction and other debilitating emotional and behavioral conditions that will have devastating effects on the individual, their family, and their community.

FAMILY DISTRESS AND RECOVERY

Staying for long periods of time in evacuation centers, forces displaced persons to confront their ordeal in an unrelenting way. In addition to the mental and emotional distress, they

have to bear with the loss of privacy in overcrowded temporary shelters. Moreover, poor sanitation, inadequate shelters and contaminated water may result in outbreaks of disease and lead to deaths.

Having to rely on government agencies and private service providers for relief rations and other basic necessities to survive another day, the evacuees also have to confront their loss of independence. In many cases, this situation aggravates the deterioration in self-esteem especially among those who were economically productive prior to their displacement. When usual family activities and economic preoccupation are disrupted, the authority of traditional breadwinners is also undercut, thus altering family dynamics. Women who lost their husbands at the height of the conflict are driven to take on roles usually culturally relegated to menfolk. Older children may also have to assume functions in the family inappropriate for their age. Subsequently, parent-child conflict and marital distress could arise.

An Iranun mother receiving psychosocial services from Balay in Parang, Maguindanao complained that her 8-year old son is a constant source of headaches to her since they returned to their village after the military left. Her boy, she observed, shouts back at her. It was also difficult for her to ask him to perform his usual household chores. The woman said that life had been doubly stressful for her since her husband died at the height of the armed conflict in their village. Aside from trying to earn enough to feed her children, she has to face up to the responsibility of raising her family by herself. Feeling tired most of the time and uncertain over their future, she became unusually impatient and irritable which manifested itself in her attitude towards her children.

During a parent-child encounter, she realized that her stress has been getting on her boy's nerves and it was this that drove him to shout back at her. She also learned that her son felt irritated by her continual stream of orders, especially when he is studying. According to the boy, he was trying hard to catch up with the studies that he missed when they evacuated. He said that most of his friends were ahead of him now that gave him a sense of self-pity and sham. When given the chance to resume his education through Balay's educational assistance, he considered it as an opportunity to erase that stigma. His passion for his studies and the need of her overburdened mother for somebody to lighten up their family load has led to family stress which they eventually resolved through dialogue, counseling, self-awareness activities, scheduling of chores and household responsibilities, and livelihood assistance from their partner-NGO.

COMMUNITY DISCORD AND HEALING

The destruction of communities and the sociocultural fabric of internally displaced persons also cut deep wounds in their hearts and minds.

People reel from the loss of their cultural activities and social identities. To evacuees, their mass exodus has separated them from their familiar world, or from a homeland where they draw their sense of safety and traditional subsistence, and where they find meaning in their lives as individuals and as a people. To many, the ensuing feelings of loss and grief drive them to doubt themselves and their capabilities to go on with their lives. They can also develop feelings of mistrust towards one another, especially to authorities and people they view as responsible for their misery.

In one community being served by Balay in North Cotabato, a schism developed in the harmonious co-habitation of Moro and the non-Moro population following a violent incident. As cohesion in the village was lost due to their displacement, the traditional divisions in the community along ethnic and religious lines resurfaced. Memories of social oppression and feelings of marginalization were exacerbated. Before their displacement, the Moros who are Muslims and the non-Moro Christian settlers who came from other parts of the country had been living together in that village as one community since the 1930s. They shared food, helped each other in tending their farms, respected each other's rituals, and allowed their children to play together. And being good neighbors whatever little misunderstanding that came their way was resolved in a non-antagonistic manner. Throughout the years, their community bonding grew stronger to the point that interfaith and inter-cultural marriages became possible and acceptable among them.

But when armed conflict erupted in their midst, the Moros and the settlers separated and moved to different evacuation sites. Feelings of animosity emerged as they blamed one another in an effort to make sense of the tragedy that had happened to their community. Old neighbors refused to look one another in the eye. Friendships between Muslim and Christian children were broken. Balay counselors provided the occasion for the community to restore their respect and trust for each other. Through a peace camp, Moro and Christian children were given the chance to play with each other once more. Those who showed signs of deep-seated anger and hostility during the activities were diagnosed as needing sustained psychosocial intervention. They were subsequently processed with the help of their families. Through structured learning exercises and games, the children recalled the good memories of their community prior to their displacement. Their sharing of stories enabled them to make more sense of the tragic events that had overtaken their village and to realize the ties that bound them together as peace builders.

For the children's parents, the activity proved to be therapeutic as well. They bridged whatever reservations they had and participated in the preparation of the summer camp. Muslims and Christian parents offered to cook food for the children. Some built sheds where the games and

other activities were held. As their elders rekindled their ties with other community members, the kids were encouraged to restore their relations with one another.

Balay provided psychosocial care to other families and individuals who were experiencing prolonged bereavement and behavioral disorders. Family and group therapies were introduced. Trauma as a result of the violent incident was explained to community members. Orientation on psychosocial intervention was also given to them, while a number of volunteers completed a counselor's training. Human rights education and peer-counselors training were also extended to both adults and youth alike.

A year after Balay started its psychosocial work in the community, Muslims and Christian neighbors are visiting each other again. They also invite each other to join in the observance of each other's rituals. The children formed a Christian-Muslim youth organization. The adults organized a cooperative participated in by both Moros and non-Moros alike. As of 2003, preparations are underway for them to participate in a training on disaster preparedness and management where they can form coordinating committees to respond in an organized and collective manner in case another tragedy befalls their community. Though the villagers still feel anxious about the possibility of the recurrence of armed conflict, they have somehow managed to face their life one day at a time and get on with the usual flow of life and coexistence.

INTERRELATED EFFECTS

The impact of armed conflict and internal displacement to individuals, families and communities are interrelated and inseparable. The trauma affecting the emotional and behavioral responses of an individual take its toll in one way or the other on the relationship between, or among, parents and siblings. Social disruption both reduces and interferes with the healing effects of the family and the community and is in itself an enormous source of stress on the individuals who make up the family and the community.

For many victims, these symptoms fade with time. But for many others, there may be longer-term emotional effects, both obvious and subtle, especially if no psychological intervention is introduced. As the days and weeks pass by in an evacuation center, a displaced person may begin to experience a wide variety of emotional disturbances such as chronic grief, depression, anxiety and guilt. Others may show signs of irritability and hostility. Some may demonstrate difficulties in controlling anger and suspiciousness. It is also not uncommon for traumatized evacuees to keep to themselves and shun other people. Sleep disturbances due to nightmares and flashbacks haunt many of them. During waking hours, the sights and sound of their ordeal may return to them as if the disaster is happening all over again, reinforcing their sense of helplessness and hopelessness.

RESPONSE PATTERNS

There may be cultural variations in the precise patterns in which disaster-related symptoms appear but findings from ongoing Balay case studies on the psychosocial impact of internal displacement in seven armed conflict-affected communities in Mindanao indicate that the emotional responses to disasters are broadly similar. However, the degree of risk to adverse mental and emotional consequences tends to be influenced by a number of factors.

1. The more severe the disaster and the more terrifying the experiences of an individual, family or community, the greater the likelihood of intense and lasting psychological effects. Balay cases that have lost a family member or have come close to death themselves are seen to be suffering from more intense grief and abnormal bereavement than those who escaped from harm. Children who barely survived in the violent conflicts and those who lost their treasured personal belongings such as books, pets and school uniforms exhibit aggression and hostility. They also take more time to restore their social relations with other children.

2. The mental and physical consequences of a disaster that are intentionally inflicted by others, such as a military assault, are likely to be greater than those disasters which may have been produced by natural causes such as typhoons or floods. Many displaced persons who come from villages destroyed by military operations blame soldiers and leaders from the national government for their misery. Those who returned to their place of origin and discovered that their homes and place of worship had been ransacked, vandalized or desecrated, harbor feelings of hatred, if not vengeance. These responses may not be as strong, if manifest at all, among survivors of extreme natural events such as floods, earthquakes and tsunamis.

3. In addition to the effects of internal displacement, the negative experiences of evacuees in temporary shelters, "tent cities," and other evacuation centers (malnutrition, epidemics, physical assaults, and other human rights violations) produce adverse emotional and behavioral effects and psychological disorders. An old Kalagan woman whose two sons were abducted by suspected military forces in Mati, Davao Oriental in the aftermath of their displacement suffered from shock. For months, she would not speak, spending her time staring blankly as tears welled in her eyes. She could hardly eat either. Her eldest daughter had to force food into her mouth. While her sons remain missing, she was able to get over her shock and depression with the help of her family and Balay counselors.

4. Being forcibly separated from a place that provides a source of security and subsistence prolongs

the trauma and retards self-healing. But contrary to the common notion, a disaster does not end for many displaced people after they have returned to their place of origin. They often remain in highly stressful, even repeatedly traumatic situations, especially if the armed men whom they considered as the cause of their oppression still occupy their villages. The lack of rehabilitation assistance to rebuild their lives and mend mental anguish reinforces their negative feelings about themselves and their ordeals.

5. The availability of a social support network — sympathetic clan members or relatives, friends, community, religious leaders and institutions, and partner service providers — reduces the likelihood of lasting emotional and mental trauma. In a number of "tent cities," the evacuees who are mostly blood relatives share whatever meager rations they have. Others moved in with their relatives and friends in town centers that are relatively far from the sites of battle. Some political and religious leaders offered their land as temporary settlement sites for the displaced, such as in Aflek in T'boli, South Cotabato and in Simuay, Sultan Kudarat in Maguindanao. The ustadzes, imams and datus can often contribute to strengthening the moral and spiritual resilience of their displaced constituencies. Wherever accessible, the madrasas or Arabic schools provide continuity in the form of the intellectual, religious and social education of children and youth. In Sirawai, Zamboanga del Norte, the literacy and numeracy program initiated by Balay served to enhance the coping resources of the displaced Kolibugans and contributed to rebuilding family and community solidarity.

Many of those who have survived and coped with a similar kind of disaster in the past, such as those who have repeatedly experienced or been exposed to armed conflict and internal displacement show more resilience in confronting their ordeal. A number of Moro evacuees in an evacuation center in Maguindanao indicated that they had become "immune" to such tragedies, suggesting that they had come to accept it as a consequence of the military response to their aspiration to have an independent homeland.

Since armed conflict-induced disasters and internal displacements affect different individuals, families and communities to different degrees, and because many of the psychological effects of displacement are created or affected by the direct social and economic circumstances, responses to this kind of disaster ought not to be purely physical, psychological nor economical relief, but psychosocial as well.

PSYCHOSOCIAL INTERVENTION

In responding to a catastrophic event, when would be the best time to conduct psychosocial intervention? In the aftermath of an armed conflict

and internal displacement, it is seldom that a victim is found to be in a stable mental state. What matters most to the evacuees immediately after escaping death and leaving their homes behind is direct concrete relief. Psychosocial intervention during this period should be directed at meeting their urgent need for access to food, water, clothing and shelter. Many of them may also need immediate medical attention, physical safety and security. Families that are separated require reuniting. The whereabouts of bodies of dead family members or relatives must also be determined and recovered as soon as possible to be given proper burial rites. Providing these immediate support services contributes to the stabilization of their physical conditions and mitigates their mental and emotional suffering. Failure to do this, however, only reinforces their distress and heightens the trauma caused by their forcible displacement.

Disaster management experts call this phase the "emergency period." At this point, the conduct of relief, medical and psychosocial missions is most desirable and timely, but not necessarily easy. Schoolhouses, government buildings, places of worship, or public parks serving as evacuation centers or "tent cities" are always teeming with people. Many of them will be seeking help, sometimes at the point of clawing at each other to get their share of whatever relief rations are offered. Some may be hanging around just to exploit the situation, even if they are not actually victims. Others are present only to satisfy their curiosity. The efforts of the service providers to provide a sense of order and control the possible occurrence of an untoward incident are part of creating safety for the victims. Not being able to do so this only invites chaos and reinforces the trauma of displaced persons.

DISPLACEMENT AFTERMATH

In the days following displacement, some victims may begin to show signs of severe distress such as intense anxiety or panic, uncontrollable crying, disorientation, or incoherence which creates more discord in their already difficult situation. At this point, psychosocial workers may provide "psychological first aid" to comfort them and reduce their stress. Letting victims express their feelings and regain a sense of control can be a big help, as does facilitating stress reduction exercises. Helping victims get in touch with family members, neighbors, and friends who can make up their own "comfort zone" and restore their social or emotional support system shores-up their coping resources and prevents the further deterioration of their emotional and mental state.

Many evacuees are not immediately receptive to psychosocial intervention, days or weeks after their displacement. Some are too dazed to respond to debriefing, and would rather try to make sense of the disaster in an introspective way. Some claim that they do not need help at all, especially those who are in denial. Others are simply unaware that what they are going through emotionally, mentally and behaviorally is indicative

of trauma that ought to be processed. Many tend to view the psychosocial workers or community counselors with mistrust, particularly if they are "outsiders" who came from other places, who do not speak their language or practice their religion.

There are a host of psychosocial interventions appropriate at this stage in the aftermath of a disaster. The principle to be observed is that the responses of service providers match the phase of emotional needs and relief requirements of the displaced persons. At this point, focusing on the identification of those that require a therapeutic partnership and sustained intervention to reduce emotional, psychological or behavioral dysfunction is essential. Some of the measures undertaken by Balay at this phase are:

1. To identify those who show signs of intense distress and are in need of prolonged services. The priority is those who have lost a loved one or treasured possession and are suffering from grief trauma, intense anxiety and maladaptive behavior. Others are those who have come close to death themselves or have seen somebody close to them die.
2. To detect and diagnose traumatized evacuees through "area scanning," profiling of communities and direct victims, and trauma diagnosis using standard documentation tools. This may be done in a number of ways such as, but not limited to, individual and family interviews, home visits, community assemblies, dialogue with the council of elders and religious or political leaders, meeting with village officials and youth camps.
3. To establish a healing alliance with individuals, families and communities for focused psychosocial intervention. Once partnership is ensured concrete support that matches the needs and intervention goals of the caseload are provided. This includes debriefing, defusing and other crisis intervention approaches, trauma awareness education, educational assistance, livelihood support, and medical and health assistance.
4. To conduct conflict mediation, peace camps, community education, disaster management training, human rights awareness programs, training of community-based counselors, assistance to community organizing and advocacy.

CONTINUING INTERVENTION

Many internally displaced persons in Mindanao remain in evacuation centers for months, even years. While government agencies regard most of them as already having resettled for fear of returning to their place of origin, their environments can not be exactly considered as permanent. In fact, their situation is far from ideal for complete healing. Nevertheless, there are ways wherein individuals and families can be encouraged to create a semblance of "normal" life.

Even within the evacuation center, people can work at keeping their family ties intact and adjust to their new family dynamics. Though coming from different villages, they can also be assisted in building new structures for their "community of displaced persons." This may involve worshiping together and engaging in other meaningful social interaction. They can engage in collective farming, provide camp security, and participate in rituals and recreational or cultural activities. An evacuation camp can also provide an opportunity to learn new skills for alternative source of subsistence. Children can be assisted in continuing their education in the public schools. Arabic schools or madrasas can also be built in their evacuation centers for those who want to pursue their religious, cultural and educational enrichment.

Psychosocial work at this phase helps in the reconstruction and rehabilitation of displaced persons and aids them to take hold of their lives in the evacuation center. Through the provision of such services, it is hoped that displaced persons will be able to eventually return with dignity to a peaceful community of their own choice. A community, that is, where they can truly rebuild their lives according to their cultural and political preference, and determine their own development in a way that helps them rediscover meaning in their lives as individuals and as a people.

Mobilizing the Support of Less Vulnerable Sectors for Disaster Resilient Communities

Celso B. Dulce

In community-based disaster management, the participation of the vulnerable sectors as primary actors is essential to building disaster resilient communities. Equally important is the mobilization of less vulnerable sectors. While they are external to a disaster situation, their support to diverse disaster management activities initiated by the vulnerable sectors is vital to increasing the resiliency fo their communities.

The very definition of disaster denotes the need for external support. For example, the Center for Research on the Epidemiology of Disasters defines disaster as "a situation or event which overwhelms local capacity, necessitating a request to national or international level for external assistance." A cursory Internet search would reveal that the World Health Organization (WHO), the American Red Cross, and many other organizations subscribe to similar if not identical definitions.

The requirement for external assistance becomes even more necessary in the context of impoverished countries like the Philippines. Situated in an area of high seismic, volcanic, and tropical cyclone activity, the Philippines is predisposed to disasters. Widespread poverty and the consequent vulnerability of the majority of the country's population complete the scenario of frequent and chronic disasters of severe magnitude. The same widespread poverty limits the capacity of Filipinos to recover from a disaster and to be better prepared for the next hazardous event. It does not help that government has not given disaster management sufficient attention it deserves. A review of the Philippine medium term development plans and the annual general appropriations acts, for instance, show that disaster management (DM) has not permeated government planning and not enough resources are allocated for DM programs.

Any person, group, organization or community external to a disaster area is a potential source of support for building community resilience to disasters, even among vulnerable groups and disaster victims. The farmers of vegetable-growing Baguio City, for example, are known to contribute part of their produce to disaster relief efforts. The community disaster preparedness committees organized by Tabang sa mga Biktima sa Bicol (TABI) in the Bicol Region are also known to part with some of their meager produce in support of TABI's

relief effort, on top of participating as volunteers of the NGO.

The less vulnerable sectors have better means to support the disaster management initiatives of the vulnerable sectors. They posses appropriate knowledge and skills and are financially and materially in a good position to assist the vulnerable sectors. More importantly, however, they are similarly moved by compassion, charity, humanitarian concern, and the universal aspiration for full human development.

The less vulnerable sectors include students who do volunteer work during major emergencies, and members of the academe who contribute to increasing disaster awareness by integrating disaster management into the regular curriculum and launching fund-raising campaigns during emergencies. They also include scientists and professionals who contribute their skills in developing and implementing disaster management projects, as well as entrepreneurs and corporations who donate either cash or other resources to disaster management endeavors. The less vulnerable sector, in its broadest sense, even include foreign donors, be they nongovernment organizations (NGOs), governments, or multilateral agencies.

Disaster management, particularly relief programs, often connote foreign donors or donations that are much bigger compared to resources contributed locally. However, large external grants for entire programs, the free services of medical professionals, and the volunteer time rendered by students are all of one weave. Regardless of amount, they are all "donations" in support of vulnerable sectors.

Some NGOs involved in disaster management, such as the Citizens' Disaster Response Center/Network (CDRC/N) and the Philippine National Red Cross take on the singular role of mobilizing support, both local and overseas, to the at-risk communities and vulnerable sectors in the Philippines. This mobilizing role involves but is not limited to launching local fund campaigns, organizing volunteers, and accessing foreign grants and donations.

MOBILIZING OVERSEAS SUPPORT FOR COMMUNITY INITIATIVES TOWARDS DISASTER RESILIENCE

In a situation where numerous hazards escalate into disasters and government lacks the resources, foresight and the will to decisively address disaster-related and development issues, NGOs have become significant actors in disaster management. They assume a range of functions, from criticizing government's deficiencies and advocating positive action to complementing its work by delivering services that fill 'gaps' in government's disaster management programs. While they augment government work, NGOs are quick to argue that government should not pass on NGOs the responsibility of attending to the general welfare of disaster victims and at-risk communities.

NGOs often look to foreign grants to finance their operations. The budgets of many NGOs are largely sourced overseas. Foreign grant-seeking is a highly competitive endeavor with uncertain results but grant-seekers persist because the substantial support from foreign grant givers far outstrips local grant-giving capacity. Substantial grants mean greater program coverage, benefiting more disaster victims and at-risk groups. Substantial grants also mean more comprehensive interventions, whose probability of program success in terms of making a difference in the lives of disaster victims and at-risk communities is greater compared to piece-meal projects that are resorted to because of funding shortage. Moreover, from an administrative point of view, there is almost the same amount of effort put to implementing a PhP500,000.00 project and a PhP5 million project.

But partnerships with foreign grant-givers are not made in heaven. It is not uncommon for southern NGOs to bemoan, albeit privately or among themselves, increasingly stringent donor requirements: different guidelines (for applications, proposals and reports), performance indicators, financial reports and monitoring systems of funding donors as well as changing policies and priorities. The grumbling is not completely without basis. Imagine a relief or other program where several donors contribute funds. In terms of reporting alone, the NGO for a single project will prepare a different report for each of the contributing donors. Some say it is a matter of cutting and pasting in order to conform to a specific guideline and format but experience proves that it is much more than that.

In the recent Emergency Southeast Asia Network (EM-SEANET) Workshop on Improving Data Quality for Natural Disasters and Complex Emergencies, discussions inevitably led to the same issue of donors adopting different grant-giving guidelines.* A participant coming from a Philippine government agency forwarded a less popular view that grant-seekers have no choice but to accept this reality. A more non-conformist view, supported by many participants, however, was to advocate for the development, and adoption by donors, of standard guidelines. The international workshop participants, most of them with long years of experience in disaster management, and representing governments, academe, NGOs and multilateral agencies, believed that standardization of donor guidelines is a realistic objective.

The issues on guidelines, reports, indicators, monitoring and evaluation are variations of the theme of accountability and performance. Donors in general entrust humanitarian aid and grants to NGOs or other intermediary organizations with the expectation that the latter will act as responsible stewards of the resources intended for identified program beneficiaries. They expect that aid will be used efficiently and in a manner that will be most beneficial to program beneficiaries.

Grant-seeking and grant-giving can be portrayed as an accountability chain, where the southern NGO is

accountable to the northern NGO, and the northern NGO is accountable to the back donor, if the northern NGO accesses back donor funding for the southern NGO's project. The southern NGO must satisfy the demands for accountability and transparency of the northern NGO who must in turn satisfy the demands of the back donor. The back donor must also satisfy the demands of some other higher authority. Finally, all are being held accountable by the public, especially if they receive public contributions or donations.

In the biannual meeting of the Active Learning Network for Accountability and Professionalism in Humanitarian Action (ALNAP) held in New Delhi in October 2002, a "radical" view on accountability was forwarded. Drawing from her long experience with CDRC and later the Asian Disaster Preparedness Center (ADPC), Zenaida Delica-Willison observed that the issue of accountability is often a top-to-bottom affair. She proposed that 'upwards accountability' should also be increasingly looked into in the relationships among grant-givers and grant-seekers.

The proposition was radical because most participants to the biannual meeting came from multilateral agencies, governments and northern NGOs. There was only a sprinkling of southern NGOs. But upward accountability is not a totally new concept. In the Philippines, people's organizations demand transparency and accountability from NGOs, who often act as intermediaries seeking funding for the projects of people's organizations and communities. This practice is indicative of the fact that the efforts to transform and empower communities and people's organizations are bearing fruit, and that the relationship between NGOs, POs and communities is healthy and vibrant. Nevertheless, the present arrangements put the southern NGO at the receiving end of accountability and transparency demands from the top (northern NGO and back donor) and the bottom (people's organization and community). In the Philippines, there is even the additional demand from government agencies, which by legislative fiat have licensing and accreditation powers over NGOs.

Southern NGOs are sensitive to this issue because many lack the institutional capabilities necessary for them to satisfy competing demands coming from various sources – demands that are often not backed up by requisite capability building support that will enable NGOs to meet rising expectations. Many grants do not provide sufficient support for program administration, expecting that this will be part of the local contribution of the southern NGOs. Institutional capability building projects also often don't get funded. This disqualifies small NGOs who may have developed good projects in collaboration with POs and communities.

In the less than ideal situation that currently prevails, the proposal to develop and adopt common guidelines for monitoring and reporting disaster events, for project applications and for monitoring and reporting project

implementation is a welcome development. However, how this progresses or if this will progress at all remains to be seen. Meanwhile, southern NGOs have no other recourse but to work bilaterally on improving relationships with donors to a level of trust that would allow for minimal narrative and financial reporting and monitoring visits. This would give the NGOs more time to pay more attention to operational program concerns. Achieving this level of trust presumes of course that the funding relationships entered into by the NGO are a product of diligent and responsible matching of PO and community needs and capacities (including that of the NGO) with the resources being made available by donors and a clear specification of donor expectations of NGO, the PO and the community concerned.

The development of the relationship between CDRC and the Dutch Relief and Rehabilitation Agency (now CARE Nederland) is illustrative of how building mutual confidence and trust can reduce the administrative burden of NGOs. In 1997, when CDRC and DRA collaborated on their first project, DRA required monthly narrative and financial reports, on top of quarterly monitoring visits. This was the first demanding engagement of CDRC in terms of frequency of reports and monitoring visits. While it had the capability to meet this demand being a relatively big and stable organization, CDRC's regional centers had less personnel and would therefore have to exert more effort to meet CDRC and the donor's reporting and monitoring demands. CDRC and the regional centers approached this issue by showing DRA that they were capable of meeting the requirements. At the same time, CDRC and CDRN pointed out to the donor that the requirements were drawing staff from away from operational concerns, and that it was therefore in the best interests of the program and the program beneficiaries that the requirements were relaxed. Over time, as CDRC and the regional centers proved their reliability and with built-up donor trust, reporting requirements were significantly reduced. The resulting partnership between the two organizations thus became even stronger.

The strong collaboration between CDRC and CARE Nederland facilitated the successful implementation of projects that increased community awareness of disasters, provided community members basic disaster preparedness skills, enhanced community capacity to respond to emergencies, and trained them to implement and manage simple disaster mitigation projects.

But even well-developed partnerships characterized by such values as transparency and mutual trust, respect of internal processes and organizational independence, well-defined and observed roles and responsibilities, close cooperation and long-term support, and commonality of development framework do not ensure sufficient and uninterrupted support. Grant-giving bodies change policies and priorities. They are also sensitive to public opinion and mass media pressure (which is understandable, as the funds they

dispense often come from public sources). Thus, even in partnerships that have lasted the better part of two decades, it is not surprising to find the financing of NGO programs drying up or, at the very least, reduced. Changing priorities and reduced funds pose a big challenge to NGOs, who have taken on the responsibility of facilitating the match between the needs and capabilities of the vulnerable sectors and the kind of support being offered by grant-givers.

Eventually, as the need for financing relief programs and other disaster management activities persists because of recurring and chronic disasters, grant-seeking NGOs are usually told to seek assistance elsewhere, and to increasingly tap local sources. Reversing the balance between foreign and local financing in favor of the latter is even suggested.

It is true that NGOs have yet to take full advantage of local resources in their various forms. On the other hand, to suggest reliance on local sources as the primary source of financing operations over overseas sources is self-delusion and a cop-out. Local resources are simply not sufficient to take the place of international humanitarian assistance. The economy does not create enough surplus resources to finance humanitarian action. The reality is that for many more years, this balance will remain tilted in favor of support coming from outside the country, if the disaster management programs of the NGOs are to make a significant impact on the country. Even the Corporate Network for Disaster Response (CNDR), through which member-corporations course their relief and other forms of assistance, has to tap foreign grant giving bodies such as the USAID for major projects

However, NGOs must still aim to strike a balance between mobilizing local resources and tapping foreign grants for financing humanitarian and disaster management projects. Employing more creative means, NGOs must increasingly mobilize local financial, material and human resources.

MOBILIZING LOCAL SUPPORT

While local donors cannot yet supplant the financial capacity of foreign donors, they nevertheless possess a unique character that is equally important for community-based disaster management and in building community resilience to disasters. Local resource mobilization is usually associated with fund campaigns. Such campaigns often accumulate goods such like used clothes, food items ranging from rice, canned goods, instant noodles, milk and bottled water, and to a limited extent, cash donations. (The value of locally donated goods always far surpasses local cash donations.) Not sufficiently recognized, however, are the brain and brawn power, of local donors which are valuable contributions in and of themselves.

The CDRN has long recognized the role of the less vulnerable sectors in disaster management. Mobilizing local resources and sustaining local partnerships are accorded great

importance by the network because it entails more sacrifice to contribute to disaster management in the context of chronic crisis. Local contributions are valued because they are statements of solidarity with and support for vulnerable sectors. There is greater empathy between the two groups as they experience the same disasters, although they differ in the degree of their vulnerability. The motivation on the part of the donors therefore goes beyond simple humanitarian concern to the shared aspiration of becoming more resilient to disasters by jointly addressing both immediate post-disaster needs and long-term vulnerability reduction.

CDRC mobilizes the solidarity and support of the less vulnerable sectors through its local partnership development program which consists of three inter-related components: networking and institutional partnership building, volunteer organizing, and sustained local fund campaigns.

The sustained, year-long, local fund campaigns evolved from CDRC's earlier practice of issuing a public appeal for donations each time a major disaster occurs. Realizing that the stockpiling of relief goods is an important disaster preparedness task, the one time fund campaigns developed into sustained year-long ones. Designed to develop a culture of preparedness among CDRC partners and contacts, such campaigns also contribute to the network's efficiency in delivering services during actual emergencies. Afterall, from an operational point of view, fund campaigning during actual disasters intrudes into emergency operations, although CDRC recognizes the reality that donors are more responsive to appeals during actual emergencies.

Institutional partnership building and volunteer organizing is the solid foundation on which the successes of the fund campaigns are built. Institutional partnership agreements often include explicit provisions to initiate or support CDRC's fund campaigns, especially during major emergencies. Volunteers also initiate their own fund campaigns in support of CDRC, or support the regular CDRC staff tasked with running the fund campaign.

Institutional partnership building is premised on mutually beneficial relations, graduating from the one-way flow of benefits where the partner institution contributes to the needs of CDRC without getting anything beyond psychic income in return. This practice was reversed in 2000 when CDRC, with UNICEF support, assisted the Philippine Women's University (PWU) in improving their level of disaster preparedness. It conducted disaster preparedness training among teaching and nonteaching personnel, helped update the disaster contingency plan of the university, and conducted a campus-wide evacuation drill. At the time, the PWU had been a consistent benefactor of CDRC's fund campaigns.

The PWU experiment in two-way partnership proved successful. It increased disaster awareness among students, faculty and nonteaching

personnel, improving the university's level of disaster preparedness, while boosting the fund raising efforts of CDRC. This experience has since been replicated in many schools and universities such as the St. Scholastica's College, Miriam College, San Beda College, Philippine Science High School, all in Metro Manila, in Maharlika Institute of Technology in Tawi-Tawi, and the Mambajao National High School in Camiguin.

CDRC's partnership with Samahang Operasyon Sagip (SOS) is another case of an institutional linkage based on mutually beneficial relations, although of a slightly different nature. SOS is a volunteer organization of medical students and health professionals that provides free medical services during disasters. By agreement, CDRC taps SOS for volunteers when disaster situations require emergency health services,. This arrangement was first tested during the implementation of an ECHO (European Commission Humanitarian Aid Office)-funded relief program in 1999.

The arrangement was a success from the perspective of CDRC and SOS. From CDRC's viewpoint, the health component of the relief program was completed according to schedule and specific component objectives were met. In fact, the component surpassed the planned results because SOS combined dispensing emergency health care with education inputs to health care. While patients were waiting for their turn to be attended to by volunteer health practitioners, mini-seminars on health care were conducted by SOS volunteers.

For the perspective of SOS, on the other hand, their partnership with CDRC allowed them to fulfill their mission even if they fail to raise the funds necessary to finance their emergency operations. Their volunteers have also gained greater awareness of disasters and disaster-related issues because of their involvement in the operations. Consequently, SOS has committed itself to continue volunteering their professional skills for future disaster relief efforts.

Judging from CDRC's experience with SOS, science and technology and other professional organizations can be tapped for their specialized skills to undertake or support network activities such as participatory rapid appraisal, disaster risk assessments, and post-disaster field surveys. Business groups can be asked to address warehousing needs or to supply relief goods at competitive prices and on short notice. The range of institutional partnership arrangements that can be set up are numerous and varied.

CDRC's institutional partnerships with schools and universities have facilitated volunteer work. The presence of a formal institutional partnership, however, is not a prerequisite to volunteer organizing. Volunteer organizing involves the formation of quick reaction teams and disaster volunteer teams in schools. Quick reaction teams activated during emergencies

undertake a wide range of emergency response-related activities such as fund raising, information dissemination, participation in field assessment surveys, disaster monitoring, and repacking and distribution of relief goods. In fact, disaster volunteer teams can have annual plans and undertake year-round activities. Aside from engaging in fund raising and participating in emergency response activities, they may also involve themselves in advocacy activities, project implementation and monitoring, community integration, training and education. CDRC has organized quick reaction teams and disaster volunteer teams in schools and universities in Metro Manila as well as in far-away Camiguin and Tawi-tawi provinces.

The possibilities inherent in local volunteer organizing, networking, institutional partnership building and resource generation are wide-ranging, as the experience of CDRC and CDRN attest. This is one of their sources of strength. The regional centers in particular, despite the limited number of regular staff working on shoestring budgets are able to undertake large operations and deliver significant support to communities and people's organizations as a result of local volunteer organizing, networking, institutional partnership building and resource generation. In one sense, CDRN is a network of networks, as each member develops and nurtures its own volunteers, partners, and networks.

CONCLUSION

NGOs perform a very important role in transforming at-risk communities into disaster resilient ones – that of mobilizing support to initiatives of communities and people's organizations. This role demands a deep sense of responsibility on the part of NGOs, who must see to it that in the mad scramble for financing for humanitarian and disaster management programs, they do not lose sight of the reason for seeking grant, which is to facilitate the delivery of assistance appropriate to the needs and capabilities of disaster victims and at-risk communities. The debate over policies, guidelines, reports, monitoring visits and evaluations can be seen as driven by the common desire of all disaster management actors to improve the system's ability to deliver the assistance to engaged target beneficiaries on the ground.

The southern NGOs, the organizations responsible for operations on the ground, work in very difficult environments. Limited resources allow them to maintain a very lean staff. Since NGOs cannot provide competitive compensation, sufficient means of transportion, and adequate communications and office equipment, they often lose good people to other organizations. While working with NGOs, the staff is often exposed to potentially dangerous security situations. Yet NGOs persevere in their work, driven by their commitment to provide humanitarian assistance, save lives and property, and make a difference in the lives of

disaster victims and at-risk communities.

The economic realities of a developing and disaster-prone country like the Philippines limits the potential of local support to outpace international support and the possibility of freeing the country from relying on humanitarian assistance from the international community, at least in the immediate future. However, this remains a long-term goal.

At present, the issues about guidelines, reports, monitoring and evaluation can best be addressed bilaterally by both grant-seekers and grant-givers. Building mutual trust and respect, fostering greater cooperation and understanding, and underscoring the common motivation of compassion, charity, humanitarian concern, and the aspiration for full human development are means of ensuring productive bilateral discussions. By not losing sight of the joint mission of donors and NGOs, which is to aid and comfort disaster victims and at-risk communities, grant-givers and grant-seekers may be able to resolve outstanding issues. It is not unreasonable to expect though that northern NGOs and back donors, collaborating with southern NGOs, people's organizations, and communities, can make the work of aiding and comforting disaster victims and at-risk communities less difficult and more fruitful through standard guidelines for applications and reporting.

Community-based disaster management provides a fresh approach and opens up a new arena for mobilizing the support of less vulnerable local groups to disaster management initiatives at the community level. With imagination and creativity, local support can still be substantially boosted. The unique character of such support can be effectively combined with overseas contributions to create a synergy that external substantial grants by themselves might not be able to achieve. There is enough evidence to show the positive contributions of overseas support to the transformation of at-risk communities into more resilient ones. The full potential of local support is just not being actualized. The challenge to all disaster management actors — vulnerable sectors, people's organizations, non-government organizations, and donors — is to contribute their share to unleashing the power of combining overseas and local support to building disaster resilient communities and replicating them all over the country.

NOTE

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Socioeconomic Influences on Livelihood Recovery of Filipino Families Experiencing Recurrent Lahars[1]

Kathleen S. Crittenden, Corazon B. Lamug, Gloria Luz Nelson

In the aftermath of the 1991 eruption of Mt. Pinatubo in Central Luzon, the residents of Bacolor town in Pampanga Province incurred recurrent threats to life, livelihood, and property from lahars—flowing mixtures of volcanic debris and water—triggered by heavy monsoon and typhoon rains. A series of lahars beginning in 1991 severely damaged all but one of the villages of the town, burying them one or more times in deposits up to nine meters thick. We report findings based on interviews with 163 women in Bacolor households sampled from three buried communities. Drawing on a vulnerability perspective, we consider the damage to these households from exposure to the lahar hazard (event vulnerability) and also to their ability to recover from such exposure (consequence vulnerability). Multiple regression is used to predict the lahar damage experienced by a household in 1991, 1994, and 1995. Lahar damage was so widespread it was an equal-opportunity hazard, unrelated to family income, education, or home ownership. However, recovery from disaster varied by social class. Using multiple ordinary-least-squares and logistic regression, we ask what factors influenced family recovery of livelihood. The family's ability to recover their livelihood was greatly affected by level of education. The lahar years exaggerated the economic distinctions between families with more and less education.

INTRODUCTION

The 1991 eruption of Mt. Pinatubo, a volcano in Central Luzon Island, was the world's largest in the past 100 years (Janda et al. 1996). The explosive eruption expelled sand-sized ashfall that blanketed hundreds of square kilometers. In addition, pyroclastic flows — rapid, ground-hugging, searingly-hot mixtures of gas and volcanic debris — deposited on the volcano slopes several cubic kilometers of particles ranging in size from silt to boulders. In the aftermath of the eruption, residents in the surrounding area incurred recurrent threats to life, livelihood, and property from lahars (Rodolfo 1995). Lahars are flowing mixtures of volcanic debris and water—triggered by heavy monsoon and typhoon rains. Resembling freshly-mixed concrete in behavior and consistency and containing 60-90 percent solid materials by weight, lahars flow down the channels of rivers that drain the volcano at speeds of up to 35 kilometers per hour on the slopes. As they reach the plains, lahars spread out and can bury large areas in debris several meters thick in a few minutes (Umbal and Rodolfo 1996).

The municipality most affected by the Pinatubo lahars is Bacolor, Pampanga, 39 km east-southeast of

the Pinatubo summit and 65 km north-northwest of Manila. At the time of the eruption, this historic town had 67,259 residents and 21 *barangays* or villages (NSO 1990). The townspeople spoke Capampangan as a first language and were predominantly of Catholic faith. This pretty town with 600 years of rich history had been the provincial capital of Pampanga for 160 years until 1904; for a brief period (1762-1764), the capital of the Philippines; and from 1942 to 1944, even the main headquarters of the occupying Japanese Imperial Army (Henson 1955). It had been a commercial center even before the Spanish arrived in Pampanga in 1571. During the periods of Spanish and American colonial rule, Bacolor was known for its culture, arts, and fine ancestral homes (Larkin 1993). Located in the heart of the fertile central Luzon agricultural district that supplies rice and sugar cane to much of the Philippines, Bacolor at the time of the eruption was a quiet farming and bedroom community nestled between three urban centers – San Fernando to the east, Guagua to the west, and Angeles City to the north. The Pasig-Potrero River, a lahar channel that drains the volcano, passes through the town just before it enters the flat plain of the Pampanga delta and spreads out. Between 1991 and 1995, almost the entire town of Bacolor was buried at least once in lahar deposits up to nine meters thick. All of its barangays were affected, and all but one was severely damaged.

An extreme natural hazard event such as a major lahar does not necessarily constitute a disaster, becoming one only when it causes so much damage to a human community that it swamps the community's ability to cope with it. In the words of Oliver-Smith (1992: 13):

> …a disaster occurs when a natural phenomenon brings damage or loss to the major social, organizational, and physical facilities of a community to the degree that the essential functions of the society are interrupted or destroyed, resulting in individual stress and social disorganization of varying severity.

By this definition, there is no question that the lahar experience constituted a disaster for Bacolor residents. The town had experienced various natural, medical, and political calamities in the past but none recent or of such magnitude (Lamug et al. 1999).

The multiple years of lahars and the widespread destruction and displacement of people damaged the regional economy, increased the demands on the national as well as the provincial and local governments, and devastated the finances of affected families. This study examines the effects of the lahars on the town-people's lives — their economic wellbeing – and the factors that predict the extent of these effects. The very first step in a family's financial recovery is to reestablish *hanapbuhay*, or livelihood. We focus on this first step, using as our unit of analysis the family or, more precisely, the household – which often comprises an

extended family. Our specific research questions are as follows: 1) What factors predict the lahar damage experienced by a household in three years of major flows? 2) What factors influenced the ability of a family to rebuild their livelihood capacity?

History of lahars in three Bacolor barangays

Not all Bacolor barangays had the same experience with lahars in any given year, although all were affected eventually. Over a several year period, lahars buried all the houses in most barangays up to the second-story level or higher. Yet many families were determined to stay. Struggling to reclaim their homes and to protect them from future flows, some townpeople raised their houses on stilts or added rooms or new stories on top of their existing houses.[2] The following is a brief history of the lahar burial experience in three buried barangays in the five-year period following the 1991 eruption.

Cabambangan is the poblacion or downtown barangay in the town proper of Bacolor. According to household heads, the barangay was buried by 1 meter of lahar deposits in 1991, 1 meter in 1992, 1.5 meters in 1994, and finally 2.5 meters in 1995, a year of several lahar events. Over the five year period, the total deposition was 6 meters (Lacsamana and Crittenden 1997). By 1996, 73 percent of the families in Cabambangan had raised their house at least once, including 12 percent who had done so twice.

Cabetican, a residential community in the town proper, was buried 2 meters in 1991, 1 meter in 1994, and another 3.5 meters in 1995. In all, the barangay was buried by 6.5 meters of deposits. By 1996, 52 percent of the families had raised their house one or more times, including 8 percent who had done so twice and 5 percent who had done so three times.

Cabalantian, a suburban community to the east of the town proper, experienced flooding but no lahars from 1991 through most of the 1995 rainy season. Then, in October 1995, the entire barangay was buried by 8 to 9 meters without warning in a single calamitous event lasting six hours. In 1996, no families resided in the barangay and no rebuilding activity had occurred.

Vulnerability, entitlement, and deprivation

A disaster involves an encounter between an extremely hazardous event and a vulnerable human population. According to Blaikie and others, the defining characteristic of a disaster is that "a significant number of vulnerable people experience a hazard and suffer severe damage and/or disruption of their livelihood system in such a way that recovery is unlikely without external aid"(Blaikie et al.1994: 21).

But what is vulnerability? Given the occurrence of an extreme natural hazard, vulnerability is the likelihood that a person or community will be negatively affected by that hazard (Bolin and Stanford 1998). It is the

degree to which life and livelihood are put at risk (Blaikie et al. 1994). As such, it is grounded in people's *capacity* to avoid, cope with, resist, and recover from the impact of the hazard (Blaikie et al. 1994, Bolin and Stanford 1998).

The human effects of disasters are not random. It is well documented that some societal groups, particularly the poor, are more susceptible than others to loss and suffering from natural hazards, and are less likely than others to recover from these effects (Hewitt 1983, Blaikie et al. 1994, Bolin and Stanford 1998, Morrow 1999). Risks are unevenly distributed among individuals, households, communities, and nations.

The vulnerability perspective, first systematized by Hewitt (1983), has emerged as a scholarly response to these observed social patterns. According to this perspective, vulnerability to a natural hazard is largely a social characteristic grounded in the socioeconomic processes that structure daily life circumstances (Wisner 1993, Blaikie et al. 1994, Cannon 1994, Hewitt 1997, Bolin and Stanford 1998). In addition to an understanding of physical hazards, vulnerability analysis considers the social inequalities that affect people's capacities to cope with these hazards. In sum, risks are viewed as a complex combination of hazard and vulnerability.

Groups differ in their vulnerability to natural hazards not because of their intrinsic characteristics, but because of the resources they can mobilize when confronted with a potential calamity. People's vulnerability comes from exposure to a hazard in combination with the social, economic, and political factors that constrain their ability to cope with it (Bolin and Stanford 1998). The most vulnerable are those with the fewest choices, whose lives are constrained by socioeconomic factors such as poverty, education and access to employment (Blaikie et al. 1994). Vulnerability analysis considers how socioeconomic and political inequality structures the impact of a natural hazard on people's lives.

Access to resources, always unequally allocated across society, affects not only the losses that people experience in a disaster, but also the recovery strategies available to them (Bolin and Stanford 1998). Thus, to understand why a disastrous event harms some people more than others, one must consider unequal exposure to hazards and unequal access to resources for dealing with them, both of which may be structured by socioeconomic status (Cannon 1994).

Sen's (1981) analysis of deprivation and entitlement can be applied to the problem of securing livelihood in a damaged economy. This approach suggests that a family's unemployment or underemployment (a deprivation) is best understood not as a simple function of the supply of jobs but also as a function of the family's entitlement, based on the resources its members command, to the means of livelihood (a commodity) that are available. The family's ability to exchange its resources, such as land, capital, skills, educational credentials,

or labor power, for livelihood will depend on the family's place in the class structure as well as prevailing rules governing entitlement to convert these resources into livelihood. These rules depend in part on social and political factors as well as the nature and health of the economy. Sen's approach encourages us not just to describe patterns of vulnerability but also to seek explanations for these patterns.

Differential vulnerability may also reflect political, religious, ethnic, and national divisions. Given its ethnic and religious homogeneity, the Bacolor populace is stratified primarily in terms of social class. Its political sources of vulnerability, arising from external factors such as a chaotic, indecisive, and overstretched national government and from fierce competition between towns to influence hazard mitigation policy and practice, are discussed elsewhere (Crittenden 2001, Lamug et al. 1999). In this article we focus on differential vulnerability among Bacolor families.

To facilitate understanding of the effects of the lahars on the lives of Bacolor families over a period of time, we elaborate the vulnerability perspective by drawing on the Nigg and Miller (1994) distinction between event and consequence vulnerability. Event vulnerability refers to vulnerability to damage from the direct impact of a hazard. Consequence vulnerability is that associated with the process of recovery from exposure to the hazard. Our first research question focuses on factors that predict event vulnerability in the form of damage experience. The second question, concerning factors related to recovery of livelihood, addresses the issue of consequence vulnerability.

Event vulnerability

Disasters caused by natural hazards are global phenomena, but increasingly their burden is disproportionately borne by people in developing countries and, within these countries, people lower on the socioeconomic continuum (Aptekar 1994). Several explanations have been offered for the relationship between socioeconomic status and vulnerability to the direct impact of a hazardous event. First, for economic reasons, an increasing proportion of people live on land that is susceptible to damage from physical hazards, such as a floodplains, steep hillsides, or volcano slopes (Aptekar 1994, Blaikie et al. 1994, Berke and Beatley 1997, Morrow 1999). To the extent that they recognize the hazard, people with more economic resources can avoid these dangerous places. If they nonetheless choose them, like wealthy Californians who desire the prestige and view of a mountainside building site, their resources allow them to anticipate, mitigate, and cope with the risk (Aptekar 1994, Bolin and Stanford 1991, 1998). For example, they may purchase housing insurance that will reduce any losses incurred as a result of an untoward event. Second, people with higher socioeconomic status tend to live in more substantial housing or housing that is better engineered to withstand known hazards (Bolin and Stanford 1991, Aptekar 1994, Nigg

and Miller 1994, Berke and Beatley 1997, Morrow 1999). These first two explanations may not apply to the Bacolor lahars as well as to other disaster contexts. Mt. Pinatubo had not erupted within recorded history, so there was no reason to suspect that Bacolor was unsafe or, for that reason, an undesirable place to live. Rich and poor lived in close proximity in all the study barangays. Clearly, wealthier families lived in more substantial houses than poorer families. However, once lahars flowed out of the river channels as they approached the plain, they slowed down and filled and surrounded every structure, however flimsy or sturdy, without destroying it in the process. The only advantage a more substantial house might have would be its height. Except in the calamitous Cabalantian event, a taller house was less likely to be totally buried in any given lahar event. A second story might remain intact above the buried first story.

A final explanation is that people with more resources have greater access to protection from the hazard agent in the form of preparedness and hazard mitigation on the part of the household or community (Wisner 1993). Although little preparation for the initial lahars was possible, this explanation is more plausible with respect to the impact of later lahar seasons.

Consequence vulnerability

To recover from exposure to a hazard is to achieve a state that would have been achieved if the hazard had not occurred (Bolin and Stanford 1991). Recovery involves restoration of physical and psychological health, physical resources, and the social relations required to use them (Blaikie et al. 1994). The adverse effects of a disaster on employment may last for years (Berke and Beatley 1997). We focus here on recovery of livelihood.

Social class is an important predictor of the extent and timing of household recovery from a disaster (Bolin and Bolton 1986, Oliver-Smith 1992, Berke and Beatley 1997). The disaster may produce losses for wealthy and poor families alike, but poorer and less advantaged households recover more slowly and less completely (Bolin and Stanford 1991). Families with fewer resources have more difficulty reconstructing their livelihoods. This means they may be more vulnerable to the effects of subsequent hazard events. Disasters caused by natural hazards often magnify social inequalities that existed beforehand (Oliver-Smith 1992, Bolin and Stanford 1991, Nigg and Miller 1994).

Residential tenure — whether a family owns or rents its home – is an important aspect of class (Bolin and Stanford 1998). Some disaster assistance programs explicitly exclude the poorest families. For example, the Philippine government resettlement program for families dislocated by Pinatubo lahars was limited to those who could prove ownership of their house and lot.

Families with more resources are better able to invest in human capital, such as education, enabling them to

obtain more stable, better-paying jobs (Becker 1993). Education is a general, transferable resource that promotes one's ability to adjust to changing labor market conditions, and that retains its value when one moves to a new location. Thus, education is a particularly valuable resource for maximizing employment opportunities in a depressed post-disaster economy. Education may also be associated with proficiency in gaining access to assistance programs (Morrow 1999).

METHODS

Design and sample

Our research is based on a community survey conducted in 1996 about the experience of families in the aftermath of the eruption (Lamug et al. 1999). We interviewed 163 adult women informants, those designated as the "woman of the house", whose families had resided at the time of the eruption in the three barangays chosen because of their differing histories of burial by lahars. We did not consider the many outlying barangays that were completely destroyed before 1994 nor two additional barangays in the town proper whose lahar history was similar to Cabambangan and Cabetican. Also excluded from this analysis was Calibutbut, the only barangay whose residential areas never were reached by lahars.

We sampled families from these barangays in four categories of resettlement status: those who stayed in the community; those involved in the national government's temporary staging centers; those in newly constructed resettlement communities; and those who had relocated to other towns without government assistance. The particular sites we chose were popular destinations for families from the selected barangays. Table 1 summarizes the distribution of respondents by barangay of origin and resettlement status. The sample from the three affected barangays includes mainly those who were relocating with

Table 1. Distribution of Respondents by Barangay of Origin and Current Status of Resettlement (in percent)

	Barangay of Origin			
Resettlement Status	Cabalantian	Cabambangan	Cabetican	Total
Stayed in Barangay		26.8	27.1	16.6
In Staging Center	79.4	7.3	11.9	36.8
In Resettlement Community	4.8	56.1	42.4	31.3
Moved Elsewhere	15.9	9.8	18.6	15.3
Total	100.1	100.0	100.0	100.0
(Base N)	(63)	(41)	(59)	(163)

government assistance, but also a few who stayed or resettled on their own. Almost 80 percent of the residents of Cabalantian, the most recently hit community, were in temporary staging centers, and none resided in the barangay. Cabambangan and Cabetican residents were in all four categories of resettlement status. Our results are limited in generalizability to the particular barangays and resettlement sites included. We treat barangay and resettlement status as fixed factors in our analysis.

Outcome measures

To answer our research questions, we considered several outcomes: the damage experienced by the family in each of the lahar years – 1991, 1994, and 1995 – and overall; and family livelihood over the five-year period following the eruption.

Damage experience

Respondents reported the level of damage to their family's neighborhood, house or home, and place of livelihood for each year of lahars. The damage experience index, assessed in 1991, 1994, and 1995, was a count of items for which the woman reported moderate or severe damage (range: 0 to 3). In addition, we computed a cumulative damage index by summing damage across the three years (range: 0 to 9).

Family recovery of livelihood

We assessed livelihood recovery over the five-year period with three indicators: a) whether the father of the family was employed in 1996; b) family monthly per capita income in 1996; and c) poverty status in 1996, estimated according to the annual per capita poverty threshold for 1994 (NEDA 1995). For each indicator, the 1991 level was used as the baseline.

Analysis

For each major outcome, we began our analysis by describing the trends over time. Then, to answer our research questions we used ordinary-least-squares multiple regression for continuous outcome measures or multiple logistic regression analysis for dichotomous outcomes, in our predictive models.

Predictors

We used two dummy variables for Cabambangan and Cabetican to represent the barangay of origin. Cabalantian was the omitted reference category.

Cumulative damage experience was used as a predictor in the models for predicting recovery of livelihood.

Several indicators of socio-economic status (SES) were used as predictors in the models. Poverty status in 1991 was determined using the NEDA (1991) formula. Monthly per capita income in 1991, computed from respondent reports, was logged to normalize the distribution. With respect to level of education, mother's education and father's education yielded such similar results in all our analyses that we combined these into a single variable, family level of education. We coded the respondent's

and her spouse's level of education as 1 for less than high school, 2 for high school, and 3 for a credential beyond high school. The family's level of education was an average of these two. By this definition, 43.6 percent of the families had less than high school education (< 2) and 16.6 percent had more than high school education (3). High school education was the omitted reference category in the regression equations. Home ownership was defined as family ownership of their house and its lot. By this definition, 67 percent of the families were home owners.

Resettlement status was represented by three dichotomous dummy variables: staging center; resettlement community; and elsewhere. Stayed in the barangay was the omitted reference category.

RESULTS

Damage experienced

Trends

For the total sample, the reported damage experienced by families increased over time, with a mean of 1.08 for 1991 (SD = 1.24); 1.62 (1.28) for 1994; and finally, 2.31 (1.03) in 1995.

Predicting damage

We estimated models for predicting the damage experienced by families each separate year as well as cumulative damage experienced. Predictors in these models are the community and indicators of socioeconomic status: home ownership, 1991 poverty status or log per capita monthly income, and family education. Table 2 summarizes the version of these models that includes poverty status as an indicator of family economic level. In each of the four models, damage experience was a function of where a family lived. Reported damage in 1991 and 1994 was greater in barangays Cabambangan and Cabetican than in Cabalantian. In 1995, the damage was greater in Cabalantian. Respondents from Cabambangan and Cabetican reported more cumulative damage over the three lahar seasons.

In all four models, reported damage experience was unrelated to family socioeconomic characteristics, including home ownership, poverty status, or education. An alternative set of equations not shown in Table 2, with 1991 logged per capita income substituted for poverty status as a predictor in each model, yielded similar results. The models explain comparable proportions of the variation in damage, and family income had no predictive power, except in 1994, when 1991 log per capita income was positively related to damage experienced that year ($b = .58$, $p < .05$). The effects of other predictors were unchanged.

Lahar burial was so widespread in these communities as to represent an equal-opportunity hazard, with damage unrelated to family income, education, or home ownership. In this sense, the lahar crisis in Bacolor was an atypical disaster. All of the families

Table 2. Multiple Regression Equations Predicting Damage Experienced by Families by Year and Overall

	1991			1994			1995			Cumulative 91-95		
Predictors	B[a]	SE[b]	P[c]	B	SE	P	B	SE	P	B	SE	P
Community												
Cabambangan	1.00	.24	< .01	1.68	.22	< .01	-.55	.23	< .05	2.13	.49	< .01
Cabetican	1.55	.20	< .01	1.90	.19	< .01	-.71	.19	< .01	2.74	.40	< .01
SES												
Home Owner	.13	.19	N.S.	.04	.17	N.S.	-.20	.18	N.S.	-.03	.37	N.S.
In Poverty 1991	.30	.28	N.S.	-.31	.25	N.S.	.02	.26	N.S.	.01	.55	N.S.
Family Education												
Less than H.S.	-.08	.20	N.S.	-.05	.19	N.S.	.10	.19	N.S.	-.04	.41	N.S.
More than H.S.	.39	.26	N.S.	-.19	.24	N.S.	-.25	.25	N.S.	-.06	.52	N.S.
Intercept	.16		N.S.	.56		< .05	2.82		< .01	3.53		< .01
R^2 (Adjusted)	.320		< .01	.467		< .01	.100		< .01	.249		< .01

[a] Unstandardized regression coefficient

[b] Standard error

[c] Two-tailed probability

in our study – poor or rich – lost their houses by the end of the 1995 lahar season. Many also lost livelihood and a few, even loved ones. All of them faced the monumental challenge of rebuilding homes and lives in the midst of turmoil, the threat of future lahars, and a crippled economy. Rebuilding a residence is a major expense for any family, and the lahar crisis had limited the resources available to families for meeting even day-to-day needs. A family with a mortgage on its destroyed home was faced with the prospect of repaying the debt in addition to securing a new domicile. Private home insurance is prohibitively expensive and quite rare, and insurance attached to a government mortgage protects only the lender, not the homeowner. Except for assistance from family members living elsewhere, loans for homebuilding were not available. Many families also needed to find new livelihoods.

Although lahars are an equal-opportunity hazard, the ability to recover from disaster is not the same for the rich and the poor. We turn now to ask what factors helped families in the lahar-stricken barangays to recover their ability to earn a livelihood.

Recovery of livelihood

What were the effects of the lahar years on the livelihood capacity of Bacolor families? Eighty-six percent of our survey respondents reported that the lahars had harmed their family's ability to earn a living. When asked to specify the harm, their most common responses fell into the

following categories: loss of work or decreased income (39%); burial of farm land (12%); necessity to seek employment far from home (7%); and loss of everything (6%).

Trends

Table 3 summarizes the changes in the economic wellbeing of families from 1991 to 1996, with respect to livelihood. In 1991, 42 percent of the respondents and almost all of their spouses were employed. By 1996, employment had declined to 31percent of the wives and 72 percent of the husbands. Over the five year period, monthly per capita income increased by a tiny amount, P150 per capita. However, the per capita poverty threshold (NEDA 1991, 1995) increased much faster, so that the poverty rate for families in the sample almost tripled, reaching 30.5 perent by 1996.

Predicting father's employment in 1996

We estimated two logistic regression models for predicting whether the father of the family, or the respondent's husband, was employed in 1996, summarized in Table 4. In the first model, predictors were community of origin, cumulative damage, home ownership, family education, and resettlement status. The second model added a control for the father's employment in 1991.

In the 27 families with more than high school education for both parents, all of the fathers were working in 1996. This "perfect" relationship made it impossible to estimate the models. To solve this problem, we looked for families in which one spouse had high school education and the other had more than high school and in which the father of the family was not employed. There were five such families. We reclassified one of them as more than high school to weaken the relationship between education and employment. Which family to reclassify was an arbitrary choice, but all choices yielded equivalent results. After this adjustment, the first model accounted for about 35 percent of the variation in the likelihood of working; the likelihood of the father working was lower in families from Cabambangan, relative to Cabalantian, and those who owned their home.

Table 3. Economic Wellbeing of 163 Families, 1991 and 1996

Indicator	1991	1996	Change
Wife working (%)	41.60	31.30	-10.30
Husband working (%)	92.20	72.50	-19.70
Monthly per capita income (pesos)	1,800.00	1,950.00	+ 150.00
In poverty (%)	11.30	30.50	+ 19.20

Table 4. Multiple Logistic Regression Models Predicting Father's Employment in 1996

	Model 1			Model 2		
Predictors	**B[a]**	**OR[b]**	**P[c]**	**B**	**OR**	**P**
Community						
Cabambangan	-2.48	.08	< .05	-2.55	.08	N.S.
Cabetican	-1.43	.24	N.S.	-1.52	.22	N.S.
Cumulative Damage	-.22	.80	N.S.	-.26	.77	N.S.
SES						Home
Owner	-2.09	.12	< .01	-1.97	.14	< .01
Family Education						
Less than H.S.	-1.10	.33	< .05	-1.26	.28	< .05
More than H.S.[d]	2.66	14.36	< .05	2.75	15.67	< .05
Father Employed 1991	—	—		3.47	32.03	< .01
Resettlement Status						
Staging Center	-1.46	.23	N.S.	-1.37	.25	N.S.
Resettlement Community	.74	2.09	N.S.	1.65	5.21	< .05
Elsewhere	1.12	3.08	N.S.	1.10	2.75	N.S.
Intercept	5.47		< .01	2.29		N.S.
-2 Log Likelihood	114.144			100.922		
Nagelkerke R^2	.352			.460		
Model C^2 (df)	35.396 (9)		< .01	48.618 (10)		< .01

[a] Logistic regression coefficient

[b] Odds ratio

[c] Two-tailed probability

[d] Adjusted to weaken the relationship

Father's employment was least likely in families with less than high school education ($p < .05$) and most likely in those with more than high school education ($p < .05$). In the second model, which accounted for about 46 percent of the variation in the dependent variable, the likelihood of the father working in 1996 was decreased by home ownership and low family education. The father was more likely to be employed if he was working in 1991, if both parents had more than high school education, and if the family was located in a resettlement community.

Predicting monthly per capita income in 1996

We estimated two multiple regression models for predicting log monthly per capita income (Table 5). The first model predicted income on the basis of community, cumulative damage, home ownership, family education, and resettlement status. This equation explained about 30 percent of the variation in income as

Table 5. Multiple Regression Models Predicting Log Monthly Per Capita Income in 1991 and 1996

	Model 1			Model 2		
Predictors	B[a]	SE[b]	P[c]	B	SE	P
Community						
Cabambangan	-.12	.10	N.S.	-.10	.13	N.S.
Cabetican	-.10	.09	N.S.	-.08	.08	N.S.
Cumulative Damage	-.01	.01	N.S.	-.02	.01	N.S.
SES						
Home Owner	.10	.06	< .10	.05	.05	N.S.
Family Education						
Less than H.S.	.01	.06	N.S.	.02	.06	N.S.
More than H.S.	.46	.08	< .01	.38	.08	< .01
Log Per Capita Income 1991				.44	.07	< .01
Resettlement Status						
Staging Center	-.08	.10	N.S.	-.15	.10	N.S.
Resettlement Community	.06	.08	N.S.	-.02	.07	N.S.
Elsewhere	.11	.11	N.S.	-.03	.10	N.S.
Intercept	.07		N.S.	.18		N.S.
R^2 (Adjusted)	.299	< .01	.447	< .01		

[a] Unstandardized regression coefficient

[b] Standard error

[c] Two-tailed probability

a positive function of home ownership (one-tailed $p < .05$) and more than high school education ($p < .01$). When log monthly per capita income for 1991 was added as a control, model 2 accounted for almost 45 percent of the variation in 1996 income. In this final model, the only significant predictors were 1991 income and education greater than high school, both positively related to 1996 income. Controlling for initial per capita income, families in which both spouses had an educational credential beyond high school earned Php2,610 more per person in unlogged 1996 monthly income than did those in which one had only high school education. Income in 1996 was not related to the original community of origin, the total damage experienced, home ownership, or resettlement status.

Predicting poverty status in 1996

Table 6 summarizes two multiple logistic regression models for predicting the likelihood that a family would be poor in 1996. The first model predicted this likelihood on the basis of community of origin, home ownership, family education, and resettlement status. The second model was the same except that poverty status in 1991 was added as a control. The first model, in which education was the only significant predictor, accounted for approximately 16 percent of the variation in 1996

Table 6. Multiple Logistic Regression Models Predicting Family Poverty Status in 1996

	Model 1			Model 2		
Predictors	B[a]	OR[b]	P[c]	B	OR	P
Community						
Cabambangan	.37	1.44	N.S.	.29	1.33	N.S.
Cabetican	.32	1.37	N.S.	.34	1.41	N.S.
Cumulative Damage	.09	1.10	N.S.	.13	1.14	N.S.
SES						
Home Owner	-.23	.79	N.S.	-.17	.84	N.S.
Family Education						
Less than H.S.	-.44	.65	N.S.	-.50	.61	N.S.
More than H.S.	-2.46	.08	< .05	-2.36	.09	< .05
Poverty in 1991	—	—		1.79	5.98	< .01
Resettlement Status						
Staging Center	.28	1.32	N.S.	.52	1.68	N.S.
Resettlement Community	-.60	.55	N.S.	-.35	.70	N.S.
Elsewhere	-.64	.52	N.S.	-.34	.72	N.S.
Intercept	-.74		N.S.	-.17		N.S.
-2 Log likelihood		157.623			145.788	
Nagelkerke R^2		.163			.244	
Model X^2 (df)	17.425	(9)	< .05	26.215	(10)	< .01

[a] Logistic regression coefficient
[b] Odds ratio
[c] Two-tailed probability

poverty status. In particular, if both parents had more than high school education, a family's likelihood of being poor in 1996 was less than one tenth as high as if at least one had only high school. The second model, with initial poverty status added as a predictor, accounted for about 24 percent of the variation in 1996 poverty status. Not surprisingly, a family that was poor in 1991 was more likely than others to be poor in 1996. Controlling for poverty status in 1991, education beyond high school still decreased the likelihood of a family falling into poverty by 1996 by over 90 percent. In both models, poverty status was unrelated to the original community, the total damage experienced, home ownership, or resettlement status.

The importance of education in recovering livelihood

We have examined the factors that related to a family's ability to begin economic recovery from the eruption and its aftermath. In particular, we have considered the predictors of three aspects of the family's ability to earn a livelihood in 1996: whether the father of the family is employed; monthly per capita income; and

poverty status. In each case, after controlling for the pre-eruption level of the livelihood indicator, we have found that the most important factor determining the family's economic wellbeing in 1996 is the educational background of the parents. Higher education on the part of the respondent and her spouse markedly enhanced the family's ability, when faced with the personal and community devastation from the Pinatubo lahars, to recover income, to secure employment in a damaged economy, and to avoid plunging into poverty. Less than high school education had the additional effect of hindering the family's ability to secure employment for the man of the household.

Table 7 summarizes the relation of family education level to the three aspects of livelihood before and after the lahar devastation. In 1991, most of the men of the household were employed, and their likelihood of having a job was not significantly related to level of education. By contrast, each increase in level of education increased the likelihood of the father's employment in 1996. Monthly per capita income was positively related to level of education even in 1991, but the relationship was much stronger in 1996. Over the five-year period, per capita income increased only in families with higher education, whereas those with high school education suffered an absolute decline. The poverty rate for families in the three communities was much lower in 1991, and the level of education in the family was not significantly related to poverty status at that time. By 1996, there was a marked difference in the poverty rates of families with and without higher education.

Table 7. Economic Wellbeing by Family Level of Education

	Level of Education					
Indicator/Year	**< H.S.**	**H.S.**	**> H.S.**	**F[a]**	**g[b]**	**P[c]**
Father Working (%)						
1991	91.9	91.5	95.0		.075	N.S.
1996	61.0	74.6	100.0		.533	< .01
Monthly Per Capita Income (mean pesos)						
1991	1,343.	1,620.	3,483.	9.89		< .01
1996	1,344.	1,424.	4,599.	32.95		< .01
In Poverty (%)						
1991	12.9	14.3	0.0		-.269	N.S.
1996	32.8	38.1	7.4		-.238	< .05

[a] F-test for comparing means
[b] Goodman and Kruskal gamma, a measure of ordinal association
[c] Non-directional p value for F, directional value for g

Table 8. Distribution of Father's Occupational Category in 1991 and 1996, Ranked by Modal Educational Credential for the Category

Occupational Category	Modal Education	1991 (%)	1996 (%)
Professional, Technical, Administrative	More than high school	4.3	5.1
Clerical	More than high school	6.4	5.8
Sales Manager	More than high school	5.0	4.3
Other	High school or more	3.5	5.0
Service	High school	5.7	5.1
Construction	High school	28.4	23.9
Skilled Labor	High school	21.3	18.8
Overseas Contract Worker	High school	6.4	4.3
Not Working, Retired	High school	7.8	27.5
Production	High school or less	1.4	0.0
Agriculture	Less than high school	9.9	0.0
Total		**100.1**	**99.8**

Why was education so much more important to a family's livelihood capacity in the troubled post-lahar economy than before the eruption? Of course, employment was a scarcer commodity in 1996 than in 1991. However, Sen's (1981) approach directs us to seek an explanation for variation in deprivation of and entitlement to this commodity in the mode of production in the economy and the relationship of families to these modes. Before the eruption, both the economy and the status system of Bacolor were primarily based on land ownership. The majority of families did own land, often inherited land. In addition to housing the family, this land often provided livelihood. Land owners farmed their land, rented it to others, and opened business enterprises on it. People without land worked for livelihood in the enterprises of land owners.

Within the limitations of our small sample of families, we can gain some insight into the changes in the economy during the lahar years by considering the occupations fathers held in 1991 and 1996 and the typical (modal) level of education for men in those occupations in 1991. Our occupational categories, based on respondents' open-ended reports are crude; for example, the agricultural category might include large land-owning farmers, farmers working their own small plots, and farm laborers. Table 8 shows that father's employment contracted overall, from 92 percent in 1991 to 72 percent in 1996. Most occupational categories contracted between 1991 and 1995,

but those in which the modal educational credential was lowest – agriculture and production, together comprising over 11 percent of the fathers in 1991 – disappeared during the five years after the eruption. These likely were the occupations most tied to local land, which could no longer be converted into livelihood. Occupations for which the typical educational credential was more than high school – professional, technical, administrative, clerical, and sales manager — contracted little, from 15.7 percent to 15.2 percent over the same period.

CONCLUSIONS

We have used a vulnerability perspective to understand the patterning of the effects of the Pinatubo eruption and its laharic aftermath on families in three Bacolor communities. For this particular disaster context, the distinction between event and consequence vulnerability is a useful addition to the perspective, because the factors that predicted initial damage differed markedly from those that predicted recovery of livelihood and psychological wellbeing.

The lahars that buried Bacolor in the five years following the Pinatubo eruption were no respecters of social stature and privilege. Damage and losses were incurred equally by rich and poor, more and less educated, and were determined only by location relative to the hazard.

Although families with more or fewer resources all suffered major losses, they had unequal capacity to recover their livelihoods. In general, destruction from the post-eruption lahars exacerbated existing inequalities and created new ones.

Education was the most important socioeconomic resource in the recovery period. It was not very important in determining a family's level of economic wellbeing before the eruption, and it was unrelated to the damage that a family suffered from the lahars. However, the ability to recover livelihood was greatly helped by higher education. Sen's entitlement and deprivation approach provides insight into why the years of lahars exaggerated the economic distinctions between families with more and less education. Other forms of wealth, such as home ownership, were of little use to an affected family in the five-year eruption aftermath. Most real estate was damaged by lahars and could not be used for livelihood production. Before the eruption, education beyond high school was a useful, but not necessary credential for employment. It became a critical resource when livelihood was scarcer and land ownership in Bacolor could not be used to create livelihood. Unlike real estate and other material goods, education is a transferable resource that *cannot* be taken away by a disaster and that can be exchanged for livelihood in various localities.

NOTES

1 Funded by the Center for Integrative and Development Studies, University of the Philippines. A previous version was presented at the meeting of the Asian Association of Social Psychology, Manila, Philippines, July 30, 2003.

2 See Crittenden (2001) and Crittenden and Rodolfo (2002) for more details on the house-raising processes developed by town residents.

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Endogenous System of Response to River Flooding as a Disaster Subculture: A Case Study of Bula, Camarines Sur[1]

Emmanuel M. Luna

People, communities, and institutions prone to disasters develop learned responses to them. For instance, constant exposure and experiences with flooding have given rise to endogenous systems of managing floods. While such systems alleviate suffering in the course of disaster, they do not often adequately address the roots of vulnerability. In some instances, they may even be used legitimation tools for inappropriate and unwarranted responses. For this reason, disaster management systems that develop endogenously would have to be open to innovations and facilitate change.

INTRODUCTION

The development and responses to river flooding have been conventionally biased for highly technical and capital intensive structural measures such as dams, embankments, dikes, underground tunnels and the like. In many cases, however, mitigating measures such as these are resisted because of their inappropriateness, the lack of consultation with people in the site of the physical intervention and the perceived negative impacts of these measures on other aspects of community life.

This paper does not argue against the role of technological advancement in the development process. It simply asserts that by itself, technology is not a sufficient response to disaster.

The discussion in this paper is based on field research in 1999-2000 that aimed to discover endogenous systems of community and local institutional responses in areas vulnerable to flooding. The ultimate objective of the study is to contribute to the eventual formulation of a more appropriate, integrated and disaster-sensitive local development planning system. The municipality of Bula, a flood-prone area in Camarines Sur was selected as the study site. The Bicol River meets another river, the Pawili River, in Bula. Although flood control projects were implemented in the past, the municipality continues to suffer from flooding because of the intersection of the two rivers and Lake Bula in the area.

Although the people in the locality are the first to suffer the consequences of floods in the area, the responsibility of responding to the affected communities have generally

fallen on support groups such as the local governments, the nongovernment organizations (NGOs), the voluntary private groups, the local church and other entities in the area. For this reason, the study involved these stakeholders in various research activities. The researcher visited the community to obtain people's perspectives on disaster, their vulnerability, and the endogenous system of responding to flooding in the area. In-depth interviews of key informants including officials were conducted to gather information and validate findings. Workshops and focus group discussions were also organized to reconstruct, critique, and validate responses to disasters. A total of 178 individuals provided data for the study. This number excludes community respondents and other LGU officials from within and outside Bula who shared valuable information and insights in informal discussions. In this regard, the *pakikipag-usap*[2] and *pagtatanong-tanong*[3] methods of Filipino psychology proved extremely useful in generating data from informal respondents who spontaneously shared their views while riding in a banca or a tricycle, eating in a *turo-turo* restaurant, waiting for a meeting, or just relaxing and having fun.

A DISASTER SUBCULTURE

It is hypothesized that developing countries with extensive experience in disasters have more enhanced abilities to respond to them. The frequent occurrence of disasters in these countries account for the emergence of of disaster subcultures involving an interrelated set of attitudes and practices among groups at various levels that make them better prepared to cope with and respond to new disasters" (Dynes 1992: 19, citing Wenger 1978).

As one of the world's most disaster-prone countries with inadequate resources to invest in disaster reduction programs, it is logical to assume the coexistence of various disaster subcultures in Philippine communities. An exploration of these subcultures—systems of preparing for disasters, mitigating their adverse impacts, managing emergency situations, and rehabilitating communities affected by river flooding would not only yield inputs for community-based disaster management but also demonstrate the operation of Filipino values such as *bayanihan*[4], *pakikiisa*[5], *pagdadamayan*[6], *pagmamalasakit*[7], *pakikiramay*[8].

FLOOD HAZARD AND PEOPLE'S VULNERABILITY

The effects of flooding on people vary with their vulnerability. While communities that have developed capacities to manage hazards reduce the overall vulnerability of their constituents, some members even of such communities are still more vulnerable than others. In the Philippine context, the poor are the most vulnerable. They do not usually have the means to protect themselves such as having better houses, insurance for their crops, extra food and supplies to store, or a life saver

or banca for evacuation. Moreover, they are the ones more likely to live in dangerous areas such as flood plains and riverbanks.

ENDOGENOUS SYSTEM OF RESPONSE

An endogenous system of disaster response approximates the disaster subculture posed by Wenger (as cited by Dynes 1992:19) In this paper, the endogenous system covers the whole range of disaster management activities of people and institutions within the affected space, from prevention, mitigation, preparedness, emergency response during the disaster,and rehabilitation and development. While the activities and norms surrounding them may not be purely indigenous, they may nevertheless be part of an endogenous system because practices that may have come from outside the community fuse with indigenous practices and adapt to the particular setting of the community.

Endogenous systems can be effective tools to minimize, if not to prevent the adverse impact of flood hazards. As flood hazards escalate into disasters, the initial responses are expected to come from within communities and local institutions since they are the ones directly affected. The endogenous responses of both the community and the local institutions are followed by exogenous responses only after some time. Based on experiences with previous disasters in the country, there is always a time gap between disaster impact and response from the outside (Luna 1997; Conaco, Hernandez, Racillo, and Sycip 1993). The initial responses are instinctive and are geared towards survival and salvaging whatever can be salvaged. They also include the organized efforts of people learned through several experiences with flooding.

Both community and the institutional responses are supposed to be complementary. However, there is usually a gap between the two that makes the local disaster management process more problematic. Theoretically, it is best if the community's endogenous system is integrated into the planning of institutional responses. It is even better for the community to be involved in these processes. After all, planning and action would have to be at the community level for them to have the greatest potential impact in disaster mitigation.

> Local communities are those social units where there is the greatest potential for impact....as a collectivity has greater resources to respond to the social disruption than do individuals, groups and organizations.....local communities are likely to become involved in responding to disasters prior to the involvement of social units in the larger society or international system....In addition, the local community is a generic form of social organization in every society, since it has a territorial base and is organized to "solve" certain problems for that population (Dynes 1992: 16).

Among the endogenous systems developed by communities are coping mechanisms that help individuals and families through difficult periods. At the institutional level, they include the family, the extended family, religious organizations and clans...formal organizations such as villages and local government" (Cuny 1983: 80). At the person level, coping mechansms include various means of taking stock of the situation (e.g. religion) and transcending the traumatic experience.

A comparative study of coping mechanisms in two Third World countries by Holand and Vorasdaler (1986) reveal how people and communities respond to disasters. They found out that:

- Traditional "open" peasant communities wait for government aid whereas "closed" ones initiate the recovery process;
- Familial ties, reciprocity, supernatural beliefs, and certain customs aided the villagers to satisfactorily cope with the physical and psychological effects of the disaster;
- Emergency preparedness can be improved in these areas by enhancing the indigenous coping mechanisms already present within the impacted population – through the use of large graphic illustrations and posters which depict simple emergency preparedness measures;
- Another way of enhancing awareness of indigenous coping mechanisms is to train development and disaster workers to be aware of such concepts...so that they can be more sensitive when helping villagers;
- It is important to take a systems approach (economic, environmental and sociocultural) in understanding the effects of marginality in creating a context for disaster and the importance of traditional mechanisms when accessed and activated in bringing about recovery (cited by Elangovan 1992: 55).

In the Philippines, research has shown various elements, processes, issues, problems, and effects of community responses to disaster. The following are some of the significant findings in the literature.

A survey among 16 villages on how the people's organizations (POs), NGOs and government agencies respond to natural and human-induced calamities, specifically typhoon and internal refugees, found out that the victims had the "capacity of mounting a certain level of response". However, these were often inadequate because of their failure to take preventive and mitigating measures. NGOs and other grassroots organizations can facilitate in mobilizing a variety of resources and structures to meet the people's emergency needs. But there were problems of coordination among them and "lack of integration of the necessary processes, resources, skills, attitude, and disaster awareness at the community level" (CPD 1989:78-80).

A study was also done on the dynamics of the total help system

during the disaster impact and rehabilitation phase in Ormoc City where more than 4000 people died due to a flash flood in 1991. The study looked at the experiences and insights of fieldworkers. Being victims themselves, the disaster workers were not able to respond immediately to the needs of the community. They also had to attend to their own personal problems. There were strong indications in this study that disaster victims would like to be involved in the process of helping. Thus, they were frustrated and angered by the inability of some outside NGOs workers to involve the victims, and the tendency of these workers to be too aggressive and pushy. At the other extreme were victims who thought differently believing government and other agencies should take care of them since they already suffered tremendous losses. Another significant insight was the realization that "Filipino values and virtues are good fallback positions and are often best demonstrated during times of crises" (Conaco, Hernandez, Racillo, and Sycip 1993: 337-348).

A study on disaster management during the Ormoc disaster "confirmed that victims living in riverside areas had the characteristics commonly associated with the poorer class, i.e. low income, low educational background, limited options in terms of employment and a place to live and low priority given to disaster management" (DPB 1994: 19). However, as in the Conaco et al. study, survivors in the sample were willing to participate in disaster management activities.

The way communities respond to disaster is also influenced by exogenous factors that introduce or apply new technologies and approaches to disaster management. For example, in the field of community development (CD), the principles of participation, empowerment and people-centered development, as well as the processes of community analysis, community education and conscientization, community organization and mobilization, and participatory planning have been integrated into community-based disaster management processes. Unlike in the past where the responses to disaster were associated with relief bags that only engendered a dole-out mentality and dependency, there have been several efforts, especially among NGOs to break away from these practices. The CD approach maintains that relief operations only play a significant role at a particular stage of disaster management. At the end of the day, it remains an emergency response; the paramount goals are still to rehabilitate and develop self-propelling communities (Luna 1998).

One of the popular approaches applied by NGOs involved in disaster management today is the Citizenry–Based Development Disaster Response (CBDO-DR). Developed in 1984 by the Citizens' Disaster Response Center Foundation, Inc., the approach is seen as an alternative approach in the Philippines.

The CBDO-DR nurtures partnership with grassroots organizations that carry out disaster management function as well as other sectoral and

local issues in the community. These grassroots partners are called Grassroots Disaster Response Machineries (GDRM) whose organizational expression ranges from a committee of an existing people's organization, to a full-blown community organization, or even a network of POs and NGOs engaged in disaster response. In an exploratory study of one NGO and five GDRMs in Camarines Sur and Albay, a strong development orientation was observed. "TABI (Tabang Sa Biktima sa Bikol) considers its disaster response work as part of the people's movement to change social and economic relations and structures which marginalize and restrict the development of Bicolanos" (Victoria 1998: 72-73). The same study identified the tasks and functions of the GDRMs as:

- Giving warning/calls for pre-paredness;
- Surveying damages immediately after a disaster;
- Coordinating with the barangay council for the emergency activities, relief, rehabilitation and disaster preparedness;
- Working with TABI for relief, rehabilitation, and disaster preparedness;
- Ensuring the smooth conduct of the relief delivery operation;
- Assisting beneficiaries; and
- Conducting mass education on disaster preparedness and disaster-related issues (Victoria 1998: 82).

These functions cover the pre-, during, and post-disaster activities. Thus far, the GDRMs have been successful in "harnessing the initiatives and participation of women, formation and strengthening of community organizations; participation of the victims themselves/vulnerable groups in the various phases of disaster response and community development efforts; mobilization of the support of the less vulnerable groups; inter-barangay coordination; and more assertion of rights" (Victoria 1998: 108-109).

FLOODING EPISODES: ENDOGENOUSLY SIGNIFICANT, EXOGENOUSLY UNKNOWN

Flooding in the municipality of Bula is a taken-for-granted reality because of its perennial occurrence. However, in the flood of 1995 is remembered for being one big flood. It was never publicized and other parts of the nation were unaware of it. Athough it was not as severe as the Ormoc flash flood,or as devastating as the lahar flood in Central Luzon, the 1995 flood in Bula is was nevertheless damaging to the affected municipalities. The old Bula residents claim that the floods of 1994, 1995 and 1996 were bad compared to what they experienced in their youth. Of these three episodes, the 1995 flood was the worst and the most unforgettable.

It was All Saint's Day when typhoon Rosing struck. Unexpectedly, by 2 November 1995, floodwaters rose to a height of 7-20 feet. Although the rise occurred at different times

because of the varying elevations of the areas, 11 barangays were submerged and the whole poblacion comprised of three barangays was under water. Floodwater above the provincial road was three-feet high while the residential areas were four to ten feet under water. Floodwater reached 12-20 feet in other rural barangays. As people recalled, "Everywhere you saw water. It was like the sea. There was no land transportation and Bula was isolated. Only boats were used for transport. It was a very difficult situation".

The flood lasted for weeks and even months in some areas. In the poblacion, the road was flooded for two weeks. In Barangays San Jose, San Miguel, and Ombao Polpog, the water remained until January 1996 or almost two and a half months. The people did not celebrate Christmas that year. "Wala kaming makain. Walang hanapbuhay. Huminto lahat. Ang mga bata lang ang masaya dahil walang pasok at naglalaro sa tubig. [We had nothing to eat. We had no livelihood. Everything stopped. Only the children were happy because they had no classes and they played in the floodwater]" For the people of Bula, the 1995 flood was different because the water rose very fast to higher levels than before; it also took a long time to subside, resulting in bigger damages.

One municipal worker, a lady and a graduate of an exclusive college for girls in Naga City kept on shaking her head as she narrated her story. She was18 years old and a college student at the time:

Nagising kami ng umagang iyon na basa ang tinutulugan namin. Naivacuate ng tatay ko yong kapatid kong maysakit. Pero noong ako na, masyado nang mataas ang tubig at hindi na namin kayang umalis. Sa bubong kami tumira ng tatlong araw. Ang hirap.....ang hirap-hirap talaga. Ang lamig-lamig sa gabi, tapos ang init-init ng bubong kapag tanghali. Hindi ka makaapak sa init kaya naglalagi kami sa puno ng mangga. Pinilit kong umalis dahil hindi ko na kaya. Lumubog yong bangkang sinasakyan ko. Buti na lang sinundan ako ni Tatay at naisalba niya ako.

We woke up that morning wet in our bed. My father evacuated my sick brother, but when it was my turn, the floodwater was already very high. We were not able to leave. We stayed in the rooftop for three days. It was very difficult. It was very cold in the evening and very hot at noontime. You can not step on the roof so we stayed in the mango tree. I tried to leave because I could no longer bear it, but the banca I was riding capsized. It was good that my father followed and saved me.

There were very few lives lost, only five, a feat that people attributed to their resilience and familiarity with flooding events in their community. But the damages as summarized in a special report were enormous, amounting to Php115.78 million. There were 3,626 housing units partially damaged and 1,107 totally destroyed.

Despite these damages, the 1995 flood in Bula did not receive wide attention. One barangay captain said that she heard a radio report for the province mentioning the names of all the municipalities affected by flood. Sad to say, she never heard Bula mentioned. She went to the radio station to inform the province that Bula was highly devastated also. Apparently, the report overlooked Bula because the poblacion is not along the national highway.

The researcher's interaction with the people of Bula reveals that they were very much aware of the causes of flooding. There was general acceptance that their municipality was prone to flooding. "Basin kasi itong Bula. Parang palanggana na sinasahod ang tubig na nanggagaling mula sa Albay at sa Camarines Sur. Tapos, bagyuhin pa ang Bicol." [Bula is like a basin that holds the floodwater coming from the provinces of Albay and Camarines Sur. The Bicol region is also very prone to typhoon.] Interestingly, the people understood in layman's terms the natural explanation for the occurrence of flood in their area.

The physical or topographical attributes of Bula, the climate and the social forces all contribute to flooding in the municipality. Four types of flooding have been identified in Bula.

1. Run-off Flood without River Overflow – Almost all barangays in the lowland areas experience flooding right after heavy rainfall. Because of the volume of rainwater and the limited capacity of the drainage system, or the lack of it, the rate of input is much faster than the rate of drainage, causing the run-off to accumulate while seeking its own level. This happens when the rivers are not yet full and therefore can still accommodate the run-off. The people refer to this as "dumaraan lang na baha" [passing floodwater]. This kind of flood subsides after one to three hours.

2. Lake Overflow – Lake Bula rises and sometimes overflows when it rains. However, the people consider floods resulting from this as not dangerous because water rises very slowly. The areas affected are the rice fields surrounding the lake. Because this flooding happens every time there is heavy rain, the fields are usually flooded more than once a year. The height of the flood ranges from leg to waist deep, depending on the amount of rain and the location of the field relative to the lake.

3. Basin Flooding without River Overflow – The lowest portion of the basin is found in the rice fields in Barangay San Miguel, Sagrada and Ombao-Polpog. In these areas, the flood can be as high as breast deep even if the two rivers, Pawili and Bicol, are not overflowing. The floodwater comes from upper areas in the north that drains into the basin through simple gravity. Since the rivers do not overflow, the basic is still able to accommodate the flood from the field. However, the floodwater does not drain easily because of infrastructure projects such as the irrigation regulation control, bridge

construction and the absence of an effective drainage system. The flood in these areas usually takes from one day to one week to suside.

4. River Overflow – Two days and two nights of continuous heavy rains can cause both the Pawili and Bicol rivers to flood all the barangays in the basin. According to those who have witnessed this, the Pawili River current flows downstream very fast. When the water flows back, then it means that the Bicol River downstream is already full. The current then flows backward and sideward instead of draining downstream, spreading into nearby communities. Even if the rain stops, rivers continue to flow strongly and, in fact, become heavier due to the run-off coming from the upper provinces of Camarines Sur and Albay.

PEOPLE'S LOCAL KNOWLEDGE AND INNER WILL

Bula is vulnerable to perennial flooding, which, as the 1995 flooding shows, occasionally reaches disastrous proportions. However, the lack of national awareness of the municipality's situation increases the vulnerability of its people. As the 1995 flood experience reveals, external support was not provided immediately, prolonging the suffering of affected communities. Needed resources were not allocated and people felt unduly neglected. The principle of the "invulnerable helping the vulnerable" did not take place. The people felt that they were left on their own when the disaster struck. Even local government officials felt this way, saying that the focus had been the city of Naga, even if the degree of flooding was worst in their municipality.

The vulnerability of people in Bula differed on the basis of age, sex, physical attribute, and economic status. There was more mention of children, the elderly, women and those with disabilities whose lives were put in danger more than the men, the adults, and those without physical disabilities. For example, a girl jumped out from the window when she saw the floodwater coming into her house, unmindful of the fact that the water outside was higher. A boy accidentally slipped from his mother's arms while evacuating form a breast–deep flood. A grandmother who could not walk had to wait for her children so she could be brought to safer ground. The women and children were also more vulnerable to social harassment as mothers ended up in conflict with each other over petty quarrels among their children. Women and children were also the most affected by the health and sanitation situation.

Access to resources and decision-making processes are factors that affect levels of vulnerability. Lower income groups and the poor have very limited access to land, occupation, income and services and are, therefore, most vulnerable. The location of their homes aggravate their situation.

Four levels of vulnerability are apparent in the study:

Level I: The most vulnerable group with less inner capacity and very limited support system from the community. They are the poor who live in depressed rural communities with very inadequate facilities and resources.

Level II: The 'vulnerable group with less inner capacity but greater support system within the community. They are the poor who live in urban barangays which are more accessible and have more facilities and resources.

Level III: The less vulnerable group with inner capacity but less support system within the community. They are the higher income families who have more resources but similarly suffer from flooding in rural communities.

Level IV: The least vulnerable group with inner capacity and greater support system within the community. In addition to their family resources, they also live in the poblacion that is very accessible and provided with greater facilities and amenities.

Those who belong to the less or the least vulnerable groups are endowed with greater resources and have greater capacity and options to respond to disasters, enabling them to provide a support mechanism to the vulnerable and the most vulnerable groups.

Interestingly, even the most vulnerable population is able to rise to the occasion when the disaster struck. Key informants narrated stories of courage and determination that reflect the people's inner strength and capacity. For instance, a mother bravely threaded a breast-deep flood to save her children. When one of them accidentally slipped from her arms, she plunged back into the water and grabbed the boy's hair.

There were also instances during the fieldwork when the researcher's attention was caught by an interviewee's local knowledge. For example, while an outsider might consider a rubber tire as a safety floater during a flood, the farmers said that they do not use tires because they puncture too easily once hit by bamboo, sharp wire or other objects. Instead, the Bula residents use banana rafts. Another farmer said that these rafts are fenced with bamboo poles to prevent animals from falling into the floodwater. The banana rafts virtually serve as floating pens for chicken, ducks or pigs. As the floodwater rises, the floating pen also rises with the animals on it.

THE ENDOGENOUS RESPONSE AS A WAY TO MOVE FORWARD

Communities vulnerable to flooding have developed an endogenous response system that enables them to adapt to disaster events. Such adaptation does not mean that people would avoid losses but that communities have developed mechanisms for responding to those losses, enabling them to move on once the disaster event is over. A local and endogenous response system connotes not just the spatial dimension

of the activities but also the social dynamics underlying it. For purposes of the discussion, these responses are categorized into those elicited before, during, and after disaster events.

Pre-disaster responses

The residents of Bula have shown their capacity in the past to resist an exogenous project that they deemed contributory to flooding in their communities—the national government's Bicol River Flood Control and Irrigation Project (BRFCIP). The project aimed to construct dykes along the river and lake banks to control flooding and store water for irrigation. Since the project entailed dredging and enlarging the river and lake area, the people believed that its implementation would increase their vulnerability. They claimed that they would be dislocated by the destruction of their economic and social base. After all, they used the land to be submerged for planting crops during the dry season and as a fishing ground during the rainy months. Accordingly, their displacement would also destroy their endogenous response to floods which is anchored in neighborliness. By resisting the project through petition, mass mobilization and advocacy, they successfully prevented its implementation.

To reduce their vulnerability, a number of families redesigned and reconstructed their houses to make them more resistant to flooding**.** Both the lower income and the upper-income families have their own way of improving and reconstructing their houses, depending on the resource available. Among the lower-income group, the most common improvements include the installation of a platform near the ceiling where they can place their belonging. They now use hollow blocks for walls instead of light materials such as sawali, bamboo and nipa. Those who could not afford a concrete housing strengthened their houses by tightening the support system at the base.

Among the upper-income group, the improvements include the construction of a mezzanine or a second floor. One family fenced-in the house to redirect the floodwater but this proved effective only when the river was not yet overflowing. Those who can afford construct new houses that are bigger, higher and sturdier. As one approaches the poblacion of Bula, one notices a housing construction boom. The new design and the construction of the houses itself is not only preparing the people for flooding, but is giving the municipality a facelift. Even some of the mausoleums in the cemetery have now a second floor.

Another preparedness mechanism employed by the community is the procurement of tools, equipment, and other instruments that can be used in the event of a disaster. The barangay council and some families have purchased boats that can be used for rescue, evacuation and transportation during a flood. In Barangay Ombao-Polpog, the boat is also used for their religious procession on the river. The municipality also allotted an amount for the purchase of a boat and

handsaw. Unlike in other barangays where development funds are spent on beautification projects, the Bula communities focused on reducing their vulnerability to flooding.

Community preparedness through the organization and mobilization of the people was also evident. Both government and nongovernment organizations have mechanisms for preparing the people for disaster. The barangay tanod trained by the Department of Local Government in rescue operations. On the other hand, there are Disaster Management Committees trained by an NGO in the various phases of disaster management. They have counter disaster plans and socioeconomic activities that increase their capacities.

Emergency response during disaster

There are community-based systems of warning and rescue operations. While the mass media is an important source of information on typhoons, the people rely more on an endogenous warning system that is more personal and direct. Their experiences with previous typhoons and floods and their observation of the behavior of the river form the basis of their predictions about flooding. Warnings made by community leaders through house-to-house calls were effective, especially when people saw their neighbors and relatives moving out towards the evacuation centers. The bandwagon has played an important role in mass evacuation in Bula.

When the flood struck in 1995, there were limited places where people could evacuate. There were very few houses with a second floor that could accommodate other people. The schools and the chapels were also flooded. The evacuation centers used were also right in the center of the flooded community. Nevertheless, the *bayanihan* spirit was alive and well in Bula. Upper income groups in the municipality opened their houses to their neighbors for temporary shelter and shared their boats for transporting goods and people.

Post-disaster response

The post disaster response was the weakest point in the disaster management system. After a brief period of relief distribution, the people were left on their own.

The amount of losses suffered by families in the wake of the disaster depended on their socioeconomic status. In absolute term, the higher-income families had greater losses since they had more property destroyed, or opportunities lost. But in a real and moral sense, the poor were the ones who lost more—their cooking utensils, bedding and literally the shirts on their back. The higher–income families were able to recover at a faster rate than the poor because they had more resources, opportunities, and means of recovering. On the other hand, the poor found it very difficult to recover. It took years for some of them to do so. Some have not even able to repair their houses at the time of the study in 2003.

Despite the losses, people did not feel the need to account for them.

Although the government estimated the damages inflicted on infrastructure and agriculture, the people themselves did not exert any effort to cost the impact of the disaster on whatever assets they possessed. Doing so would not only have made them sad but dwelling on their losses would have prolonged their agony. They simply moved on psychologically.

The role of kinship in rehabilitation was very significant**.** For those whose houses were totally destroyed, families temporarily lived with their relatives. Some lent them money so that they could rebuild their house or buy new household utensils. There was no mention of people receiving assistance from the government for rehabilitation purposes.

In the absence of effective means for the rehabilitation of agriculture, farmers had no other recourse but to borrow again from private lenders who charged them high interest rates. In effect, they had to pay two sets of loans for one cropping season. Worse, there were situations when the new seeds planted had not yet matured but were destroyed by another typhoon or flood. In this regard, farmers would simply say that the situation was beyond their control.

It is interesting to note that psycho-social intervention was never mentioned as a rehabilitation measure by any of the staff or people in the community.

Institutional response

The respondents of the study agree that the responses of local institutions such as the local government units (LGUs) and NGOs were inadequate. The endogenous system of the community has not been integrated into institutional processes of disaster management.

The relief distribution was not commensurate to the material needs of the flood victims. For a flood that lasted more than two months in some communities and that destroyed the crops and other sources of livelihood, the relief consisted of three kilos of rice, three cans of sardines and packages of noodles. It might have satisfied hunger for a day or two; in effect, the families were left on their own to source food and income.

What is notable is that the demand for relief goods did not come only from the poor. Those from higher income groups also felt bad when they did not receive relief goods. The importance of the relief pack was more than just a few days food. The respondents also saw it as symbolic of “pakikiramay, pakikiisa, pakikidalamhati”. It was akin to giving a condolence card to a middle-income family who might not need the money but the sympathy.

The interviews reveal an interesting dimension of relief operations. While it is imperative for disaster victims to receive adequate relief goods, the act of distributing such goods is double-edged. While it can foster dependency and apathy, it can also be used as an expression of concern that could ease the healing process for victims. They would feel that other people cared about them. Moreover, they did not have to suffer the added burden of worrying about

where their next meal would come from.

On the part of LGUs, key informants expressed the difficulty of re-channeling their services to disaster victims when they themselves were victims of the same disaster. Nevertheless, many of them heroically attend to their duties. The staff of the Health Office went to the communities and provided chlorinated water and health and medical services. The Department of Social Welfare and Development led in the distribution of the relief. The Integrated National Police led in the rescue and in the security function. Despite their heroism, however, the staff interviewed were one in saying that the resources of the municipality were not enough for a disaster of that magnitude. For instance, transportation facilities were inadequate. The municipality did not have any boat to reach far-flung communities.

Similarly, planning for disaster management was very inadequate. Based on the researchers' assessment of the disaster plan, it seemed that the plan was done just to meet the minimum requirements of the law where each municipality must have a counter disaster plan. It merely listed activities without any assessment of the hazards; specification of strategies for disaster prevention, mitigation and preparedness; and an outline of the means of implementing the plan. Similarly, the comprehensive plan of the municipality showed little concern for flooding in the municipality. While it recognized that the municipality was prone to flooding, there was no outright statement on how to prepare communities to manage flooding.

As noted previously, the people of Bula have their own way of responding to flooding. However, they do not have access to the institutional processes for disaster management in the LGU, which hardly exist. It is ironic that the municipality does not have the necessary preparations for floods. The local plans were not attuned to this perennial hazard. Of the five barangays covered, only Barangay San Joe and Barangay Fabrica had disaster preparedness plans drawn up with the assistance from an NGO based in Naga City.

As expected, the disaster mitigation measures that require structural development were also beyond the capacity of the LGU**.** Due to limited financial resources for structural development, the LGU has to rely on external assistance, either from the DPWH or from the Office of the Governor. This is the reason why all the Sangguniang Pambayan could do was to pass resolutions requesting the national agencies to allocate budget for their structural projects. Some NGO and community leaders expressed concern about the ability of government to plan and undertake large scale and capital-intensive projects like the Bicol River Basin Flood Control and Irrigation Project and their inability to underwrite small-scale structural projects to mitigate the adverse impact of flooding.

CONCLUSION

As a consequence of continuing interaction with the environment, people and communities have learned to adapt to situations that put them in danger. However, there are times when the environment has changed considerably that the learned behavior for managing hazards is no longer good enough. The people in the perennially flooded communities of Bula are used to flooding. But it is evident in their case that when the 1995 floods came, they were not prepared to mitigate its impact..

It is heartening that endogenous responses in true *bayanihan* spirit were observed by Bula residents at the height of their suffering. However, such responses can be seen as reinforcing a subculture for reactive and ameliorative behavior to disaster events. In the long run, relying on these responses might distract from addressing the underlying causes of people's vulnerability.

What is needed is a more progressive endogenous response that addresses the roots of vulnerability – the inequitable distribution of resources, the apologetic and conformist consciousness, the unresponsive institutions with lopsided programs and policies, and the oppressive relationships in the communities that leave the vulnerable at the mercy of those who are in power.

Small municipalities and local governments that are very vulnerable to disaster are in the same situation as their people when they are matched against other areas that are much more endowed with natural and human-decided resources. Just imagine a poor municipality having an annual budget that is smaller than that of the annual budget of a barangay in 'rich' Metro Manila. How can such a municipality respond effectively when the resources are so disproportionately allocated? Money is not all that matters. Their capacity to respond is limited by existing institutional and structural arrangements that require some modifications. Unfortunately for the municipalities, the power to decide on these modifications is not in their hands but in the hands of the legislative and national administration.

The endogenous system of response by both the communities and institutions are not a closed system that excludes the possibility of assimilation and innovations from the outside. For example, as a result of this research, a Disaster Response Sectoral Plan was developed for the the municipal comprehensive plan of Bula. It is time now for the LGU to seriously consider the integration and implementation of the sectoral plan, the basic part of which is the institutionalization of disaster management planning by enhancing the LGU's capacity to respond.

The integration of the community's endogenous system of response to disaster with development concerns is another factor to consider in the planning process. This can be facilitated if the working relationship between the communities and nongovernmental organizations specializing in disaster management

are strengthened. At this time, there are already linkages among NGOs and individuals who can be mobilized as partners in this endeavor. What is needed is to open up existing systems of managing disasters to this partnership.

NOTES

1 The research from which this paper was based was supported by the Office of the Vice-Chancellor of Research and Development, University of the Philippines, Diliman.

2 Casual conversation.

3 Informal way of asking questions.

4 Voluntarily providing help and support to a person in need in the community.

5 Being united with as one in support to a person.

6 Acting together in mutual support.

7 Expressing one's concern and providing help to prevent an untoward event.

8 Expressing one's concern and providing help during and after an untoward event.

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In Times of Affliction: God and Preparedness are our Protection

Manuel Abinales

The Environmental Constraints Map of San Mateo, Rizal depicts Libis in Doña Pepeng Subdivision as one of the thirteen areas that is prone to flooding. Libis is more or less a seven-hectare patch of land located at the embankment of a major waterway, the San Mateo-Marikina River and its tributary, the Nangka River. Dwellers have set-up their houses on this elongated strip of land. The southwestern tip of Libis community abuts onto the juncture where the Nangka River feeds into the San Mateo-Marikina River on an almost 45 degree angle. During heavy and continuous rains, the waters of the Nangka River slam into the turbulent flow of the San Mateo-Marikina River and pushes water back upstream. Floodwaters then begin to inundate houses, arable land, and, in the last few years, erode the river banks and undermine the foundation of houses, causing them to slide into the river.

The origins of Buklod Tao date back to October 1995 when the inhabitants of Doña Pepeng subdivision, North and South Libis of Barangay Banaba in San Mateo contested the legality of on-going activities on an adjacent patch of agricultural land that residents used as their *tumana* – i.e., their piece of arable land planted with vegetables, corn, watermelon, and other root crops. The land was degraded by a construction company that was erecting a cement batching plant right on top of the tumana. Buklod Tao was formed at the height of this community protest. It registered as a non-stock, non-profit peoples' organization on 1 February 1996 with the Securities and Exchange Commission.

THE ORIGINS OF BUKLOD TAO

All organizations have their initial acid test. Ours came with the monsoon rains that accompanied Typhoon Ibiang on 18 August 1997 – only month and 27 days after the formation of our rescue services. The three newly formed all male rescue teams and the all-female health and relief teams implemented a disaster-preparedness plan that quickly formulated in time for the flooding season.

The plan evolved from a one-day seminar-workshop on hazard mapping conducted on 22 June 1997 at our community chapel. The workshop concretized the concepts of hazard, vulnerability and risk assessment as applied to our community. The

afternoon session focused on the formation of three rescue teams: one each for South Libis, North Libis, and the *sentro* of South and North Libis. Our newly organized CBDM charged each team with the following tasks: (1) setting up an early warning system utilizing megaphones; (2) rescuing flood victims using boats, ropes, and flashlights; (3) providing evacuation assistance to two identified evacuation centers in the community; and (4) formulating a simplified counter-disaster plan. Our seminar-workshop culminated in an oath-taking by new members, the inspection of the fiberglass mould for our boats, and its transport (hand-carried by members) to the shop of another member who fabricates fiberglass items for motorcycles. The three rescue teams were subsequently equipped with boats, ropes, megaphones, first-aid kits, and flashlights. They drilled by the river with neighborhood children loaded inside the boats.

Typhoon Ibiang (international code name, Winnie) with 160 kph winds, rising to gusts of 195 kph near the center was inside the Philippine Area of Responsibility from 15-17 August 1997. On its way to eastern China, the typhoon enhanced the southwest monsoon, bringing heavy rains to the western sections of Luzon and Visayas. On 18 August 1997, the Mt. Oro rainfall intensity gauge in Montalban recorded a total rainfall of 146 mm, up from the 5mm registered the previous day. Similar rainfall figures were documented at the Boso-Boso rainfall intensity gauge. The readings were significant for the CBDM because the river systems of Mt. Oro and Boso-Boso feed into San Mateo-Marikina river. With very high accumulation of surface runoff, the water level gauge for the San Mateo-Marikina River in Montalban topped 25 meters at 10:00 p.m. on 18 August.[1] It started to recede at only 5:00 a.m. on 19 August.

Throughout that ominous night on 18 August until dawn the following day, all our DM teams were dispatched with their paraphernalia to their respective areas to conduct early warning, rescue families trapped in the flood, evacuate people to the chapel and elementary school, and keep a record of the number and whereabouts of evacuees. We realized this was preparedness *during* a disaster event.

The Buklod Tao Reading Center was the site of our emergency operations. The meetings throughout the typhoon and the evaluation after the flooding were held in the Center. On normal days, the Center, based at the carport of our residence as founding President, offers reading materials on the eonvironment to adults and children. When the weather was fine, children from two to twelve years old, usually congregate in the Reading Center to read or simply gaze at the colorful pictures of land and sea animals, trees, rocks, shells and minerals. Some would choose to color outline sketches of houses, boys, girls, animals and trees on the pages of donated used books.

In the wake of the typhoon, there were still hungry evacuees at the chapel and the school turned

evacuation center. The third phase of disaster management commenced. Buklod Tao's CBDM called for relief deliveries to those most affected by the flood. After the one-hour emergency evaluation meeting, Buklod Tao's EOC contacted the National Office of the Department of Social Welfare and Development (DSWD) and the Citizens Disaster Response Center (CDRC). DSWD advised Buklod Tao to coordinate their relief operations with the local DSWD. Upon the advice of the parish priest who saw the extent of the needs of the evacuees, I, as the association's president went to the Municipal Hall to see the local DSWD head who endorsed the request for relief packs for the Dona Pepeng evacuees.

The Typhoon Ibiang experience, however, disclosed a good partner in CDRC. Its Metro Manila Coordinator assured us over the phone that the needed relief items would be delivered either that afternoon or early the next morning.

On the morning of 20 August, a CDRC pick-up vehicle arrived at the Buklod Tao Emergency Operations Center (EOC) and unloaded: two sacks of rice, forty-five small cans of sardines, three kilos of mongo beans, one kilo of dried fish (dilis), and two five-gallon containers of potable water. CDRC staff also provided blank forms to be filled in by the head of our relief team for appropriate reporting on the manner in which Buklod Tao conducted its relief delivery operations. Numbered stubs were distributed to the evacuees that afternoon, while the lady members of our relief team weighed and repacked the goods. Actual distribution commenced mid-afternoon and lasted till 9:00 p.m. that night.

This was the first official contact of Buklod Tao with CDRC. It was not my first time to interact with the Center, however. In August 1995, a group of trainers from CDRC were commissioned by the Ministry of Social and Human Development/ Social Action Center of the Diocese of Antipolo to conduct a three-day live-in seminar/workshop on Disaster Management. I attended the training as a *tagadiwa* (animator) for the Basic Ecclesial Communities (BEC) of the parish at the time.

The BEC formation is one of the programs of the Ministry. It aims to introduce peripheral communities of the parish to the life of communal prayer, love, and communion that characterized the small communities of early Christians. The poor and marginalized are given priority in the BEC, which envisioned a participatory church with preferential option for the poor. In line with the participatory character of the BEC, I organized as tagadiwa, six *buklod* or cells of 10 to 12 neighbors in North and South Libis that met weekly. Since the meetings were held on weekdays, the housewives were the ones who represented their family in the buklod's liturgical discussions.

The participatory spirit of the BEC and the existence of community-based cells made it easier to tap into the CDRC training on CBDM because their underlying philosophies resonated with each other. The training inspired me

to integrate the approach in the buklods, an idea that was not immediately acceptable to the majority of buklod members. It took another two years for the seeds of CBDM to germinate in our community. Following is an account of how this came to be.

MOBILIZING A COMMUNITY

In the latter part of September 1995, Sitio Dońa Pepeng (the site of Buklod Tao) was surprised to learn that the nearby tumana, an 18,105 square meter-piece of arable land located on the embankment of the San Mateo-Marikina River was purchased by a construction company. Since 1947, the community had been self-sufficient in fresh vegetables, thanks to the plants grown and harvested in the tumana. Apart from its provision of food, the tumana also served as a natural catchment for floodwaters from the San Mateo-Marikina and Nangka Rivers. The tumana no longer serves this function. A free patent land title awarded to a well-to-do physician and resident of the nearby town of Marikina in 1968, which was sold to the construction company, gave the latter discretion to disregard the provision in the land title to demarcate and preserve as permanent timberland a 40 meter strip of land from the riverbanks. The proviso stipulated that the land strip was to be planted exclusively to trees of known economic value and ought not be cleared even for ordinary farming purposes.

The construction company did not follow this proviso. It started drilling a deep well within the 40-meter easement to extract groundwater for the industrial use of its proposed cement batching plant. Interestingly, an earlier attempt in 1991 by a quarry operator from the town of Montalban to establish a rock crushing plant on the tumana had been overwhelmingly rejected by subdivision homeowners. However, the cement company had a much easier time because it acquired the title to the land in November 1995 after winning the contract to construct the Batasan-San Mateo Bridge located about 200 meters from the tumana. Inquiries lodged at the municipal office revealed that the construction of a cement batching plant was allowed to expedite the construction of the bridge. In fact, the company had the full support of the Sangguniang Bayan and the Mayor who passed a series of municipal resolutions (Resolutions No. 95-110 and 95-112) approving the project and re-classifying the tumana from agricultural land to industrial use.[2]

The six buklods were consulted during their weekly 'bibliarasal', a one and a half hour session in which cell members pray the rosary, read the gospel for the coming Sunday, engage in a few minutes of silent meditation and share insights. Since the sharing was headed by the tagadiwa, the discussions after the liturgical exercises served as the group's informal perception survey at the grassroots level on the construction. The discussions revealed an overwhelming opposition to the construction of the cement batching plant for many reasons, among them:

- Exposure of children to the very real risk of being run-over by traversing cement mixer trucks;
- Inhalation of cement dust day in and day out;
- Pollution of the San Mateo-Marikina River with cement sludge;
- Disappearance of our tumana;
- Likelihood of water shortage;
- Possible illegality of the cement batching plant near a major river and its being built on agricultural land despite municipal resolutions and ordinances to the contrary;
- Noise levels; and
- Changes to the elevation of the tumana area as dumped filling materials would make the level of our houses lower, increasing our vulnerability to flooding.

Our community wasted no time in organizing ourselves to oppose the construction of the cement batching plant. For its part, the construction company quickly commenced its illegal activities: dumping filling materials at the tumana area until late at night, drilling holes to extract underground water for industrial use, and constructing a perimeter wall to protect the site from floodwaters, so rendering the immediate residents more vulnerable.

These acts aroused our communal survival instinct. We had no choice but to move against perceived hazards and risks. We foresaw our vulnerability and witnessed it increase with the construction and eventual operation of such a cement batching plant adjacent to our community. As a community, we decided to have none of these.

We embarked on a program of community advocacy for our own and our children's sake and instituted a program of disaster mitigation, albeit of a non-structural nature. First, we sought assistance from Saligan, an alternative lawyers group based at the Institute for Social Order in Ateneo de Manila University. Saligan, in turn, referred us to Tanggol Kalikasan, the legal arm of the Haribon Foundation, since our issue was environmental in nature. We wrote the Sangguniang Bayan requesting a public hearing to discuss the merits and demerits of the project and were accompanied to the subsequent session by a lawyer from Tanggol Kalikasan who acted as our counsel. A signature-gathering campaign was launched in the community to dramatize to the Mayor of San Mateo our strong opposition to the establishment of a cement batching plant in our vicinity. To prevent the truck haulers from dumping filling materials on the tumana, we barricaded the entrance to the site with tree trunks, cement posts and old galvanized iron sheets and posted placards with messages denouncing the project. People joined the picket, lighting bonfire through the long nights of protests.

Through our own initiatives, the issue was elevated to the office of the Sangguniang Panlalawigan of Rizal province and letters were sent to all the board members stating our case and requesting their support. On two separate occasions, three board

members conducted on-site inspections to acquaint themselves with the situation. The municipal agrarian reform officer of San Mateo followed suit and also conducted her own investigation. In February 1996, the whole community including the school children staged a protest march to the town plaza to gather in front of the munisipiyo. Just as we were leaving the subdivision, our way was blocked by a squad of policemen determined to prevent us from proceeding any further. However, thanks to the timely intervention of SP board member Atty. Enrique Rodriguez who was able to mediate with the police officer-in-charge, we were permitted to continue with our protest march.

Through the legal assistance of *Tanggol Kalikasan,* we also lodged a formal complaint to the executive director of the National Water Resources Board (NWRB) on the issue of the illegal extraction of ground water for industrial use by the construction company. The complaint resulted in two appearances at the quasi-judicial board of the NWRB. Key officers and members of Buklod Tao were present at a conference called by the technical director of the Environmental Management for Protected Areas Systems of the Region 4 Office of the Department of Environment and Natural Resources (DENR). Moreover, we were summoned to attend a public hearing at the Laguna Lake Development Authority in the provincial capitol to discuss air, water and noise pollution relative to the cement batching plant. At all times, I was anxious to maintain close communication and liaison with the diocese. The presence of the diocesan in-charge of BEC and the diocesan program coordinator for the Social Action Center during the public hearing at the Sangguniang Bayan greatly uplifted all the buklods. As a final step, we sent an open letter to the Mayor, questioning the legality of the municipal resolutions and ordinance that approved the conversion of the land from agricultural to industrial use.

Throughout the protests, our buklods were undergoing a rite of passage, a maturing of sorts. From a mere liturgical-bible reading-meditation-sharing of insights group that held weekly gatherings, we had journeyed to a new level of liberation that I had been told about during the BEC-CO training of the diocese. Although this word 'liberation' was never uttered during the entire advocacy process, it manifested itself in the praxis for the community: we had no other option but to act and free ourselves from the clutches of political arrogance, utter disregard for the welfare of the marginalized by the more influential and the rich, and the eventual enslavement of the entire community to the clutches of flash floods, inundation, siltation and pollution of the nearby rivers.

Our predisaster, nonstructural mitigation initiatives lasted seven months. Buklod Tao emerged victorious in many different ways. We were able to prove that the united voice of the peripheral communities could become a resounding clarion call for concerned government agencies

Counter Disaster Plan sa Panahon ng Baha

SENARYO I: Patuloy na malakas na buhos ng ulan sa loob ng anim na oras.

PAGKILOS: Bantay-ilog; iaktibo ang EOC at ROC; early warning; pasimula ng komunikasyon sa CDRC, DDMC- parish at diocesan.

SENARYO II: Pag-apaw ng ilog Marikina at Nangka.

PAGKILOS: Paglikas ng mga bata, matanda, babae sa classroom at sa kapilya; headcounting ng mga evacuees; ibayong warning/alarm.

SENARYO III: Baha umabot sa buong tumana at kalsada at dalawang libis.

PAGKILOS: Malawakang paggamit ng rescue boat, rescue rope, ibayong warning, ibayong communication link. Paglikas ng mga pamilya o tao na hindi kumilos sa senaryo II at nakulong na ng lumaking baha.

SENARYO IV: Baha umabot na sa buong subdivison at aabot pa sa Gen. Luna National Road

(Worst Case Scenario).

PAGKILOS: Ibayong warning – matagal na pagrepeke ng kampana ng kapilya, pagdulog sa transportasyon ng mga tao, rescue ng mga naiwan pa sa mga bahay, massive evacuation ng buong sitio papunta sa BANCOM at MARVI HILLS, ibayong communication link sa CDRC, DDMC, sa parokya at head-counting ng mga evacuees.

and civil society to take notice and eventually extend support to a legitimate cause. It was a triumph for the rule of law in upholding the Water Code of the Philippines, the rules and regulations of the National Water Resources Board, and the Laguna Lake Development Authority. Even if we did not find allies in the Sangguniang Bayan of San Mateo, we were able to establish rapport with the Region 4 Office of the DENR and the Sangguniang Panlalawigan of Rizal province which issued a Cease and Desist Order and a resolution nullifying and voiding the municipal ordinances that were directed against our welfare. The whole episode also served notice to the local politicos of our town that they could not just simply adopt resolutions and ordinances at whim or upon the dictates of the rich and the influential without first consulting the affected stakeholders.

Despite our relative success, damage had been inflicted on our immediate environment. Thus, our pre-disaster preparedness needed to be

reinforced. Preparedness after all is an on-going process rather than a one shot deal. We could not stop with obtaining a single policy or piece of legislation. We had to keep our functional cohesiveness intact for the common good by developing plans to sustain and reinforce our organization.

Buklod Tao was a mere fledgling peoples' organization in 1996. Freshly scarred from political innuendos, harassments, and even legal suits, we set our goals towards the acquisition of much needed resources.

Earlier this paper described the formation and equipping of our three DM teams in a one-day seminar. Buklod Tao was able to conduct the activity with a small grant from the Royal Netherlands Embassy in Manila. Thirty thousand pesos were earmarked for the disaster preparedness component of our project with the Embassy. That small amount was well spent: Php 6,000 for the production of training kits and the Citizens' Disaster Response Center DM Handbook, *Bagyo, Lindol, Bulkan at Iba Pa*; and Php 26,000 for the fabrication of three rescue fiber glass boats, and the purchase of ropes, flashlights, batteries, megaphones, and first aid kits.

The second phase of our pre-disaster preparedness initiatives (following the first phase or the community's all-out opposition against the cement batching plant) can be chronicled as follows:

June 22, 1997: One-day seminar/ workshop on disaster management in our community chapel;

June 24, 1997: Purchase of ropes, megaphones, flashlights, and first aid kits;

June 27, 1997: completion and delivery of our first fiber glass boat;

June 30, 1997: completion and delivery of our second fiber glass boat;

July 2, 1997: completion and delivery of our third fiber glass boat;

July 5, 1997: Meeting of DM teams and the creation of a Counter Disaster Plan; and

July 12, 1997: Rescue drill at the river and distribution of equipment to the three teams.

On 18 August or 57 days after we formally organized for disaster management, Typhoon Ibiang brought its heavy rains. Although several houses were swept away by the waters, no one was killed and many people were able to save their belongings. Since then, everyone felt less insecure during typhoons because of flood-level monitoring, early warning monitoring, rescue operations, and the relief assistance activities of the DRC and Buklod Tao.

POSTSCRIPT

Although Buklod Tao is the only people's organization in the newly formed Philippine Disaster Management Forum, it ensures that the presence, voices and interests of communities in CBDM are felt, heard, and upheld. After successfully engaging in disaster preparedness and

emergency response activities, Buklod Tao has expanded the scope of its operations to other vulnerable communities in building-up their own capacities in CBDM.

Word of Buklod Tao's activities have gone the rounds and neighboring communities have requested assistance in the training and formation of their own Disaster Rescue Committee (DRC). Aside from engaging in major community programs, Buklod Tao members have also helped Banaba Extension prepare for disasters. A one-day Disaster Management Orientation (DMO) was followed by a two-day Disaster Preparedness Training (DPT) in January 2002 culminating in the formation of a DRC. Buklod Tao has continued to help this DRC by passing on its old but still serviceable preparedness logistics.

Hazard, capacity, and vulnerability assessments workshops with Buklod Tao leaders as resource persons were also conducted with villagers in four other nearby communities: Riverside Libis, Riverside Dulo, Riverside Bungad, and Pulang Lupa, all part of Barangay Santo Niño. In June 2002, a two-day DPT was held in Sitio Gipit. A year later, a counter disaster planning session was held and a DRC formed. Upon referral by the Social Action Center of the diocese of Antipolo, Buklod Tao even assisted in the formation of a disaster management committee in a far-flung rural community at Barangay Calawis (Antipolo City), some 40 kilometers from Manila. After a two-day DPT, the Calawis Community-based Disaster Group was formed.

Buklod Tao was even given the opportunity to present its disaster response and mitigation activities in the First National Conference on Community-based Disaster Management that was organized by the National Disaster Coordinating Council, the National Defense College of the Philippines, and the Philippine Disaster Management Forum on 28-30 January 2003 to showcase "good practices" in CBDM and to aid in the process of building safer and more disaster- resilient communities.

NOTES

1 Effective Flood Control Operation System (EFCOS) posted the following water level information for the same river on that night: 11:00pm – 25.19 meters.; 12:00am – 25.23 meters; 1:00am, 19 Aug. – 25.36 meters; 2:00am – 25.52 meters; 3:00am – 25.71 meters; 4:00am – 25.84 meters; 5:00am – 25.87 meters.

2 These ordinances and a subsequent one (Ordinance No. 96-02) reaffirming this intent were later overturned by a resolution of the Sangguniang Panlalawigan (SP) of Rizal province (Resolution No. 96-38) that adopted: "A Resolution declaring Ordinance No. 96-02 of the Municipality of San Mateo, Rizal as null and void." Furthermore the SP Resolution also "resolved to order the Municipal Government of San Mateo and their assignees to cease and desist from any further action relative to same ordinance."

Natural Hazards and Cultural Change Among Traditional Philippine Communities: An Alternative Framework of Analysis

Jean-Christophe Gaillard

Natural hazards are natural phenomena that pose a threat to people, structure or economic assets and which may cause disasters (adapted from UN-DHA 1992). Natural hazards include earthquakes, volcanic eruptions, landslides, tsunamis, storms and cyclones, droughts, floods and storm surges, among others. The cultural impact of natural hazards on traditional communities has been the object of debate in the international literature. There is particular disagreement on the capacity of traditional communities to recover on their own without relying on external support, which is itself a possible vector of cultural change.

This article focuses on this issue. It begins with a critical review of existing models of responses of traditional communities to natural hazards as illustrated by examples from the Philippines. An alternative framework incorporating factors accounting for culture change in the wake of hazardous natural events is eventually proposed. It is worth mentioning that this study only covers fast-onset and contemporary events and thus excludes ancient disasters and those resulting from slow-onset hazards like droughts, subsidence, and climatic changes.

NATURAL HAZARDS AND TRADITIONAL COMMUNITIES IN THE PHILIPPINES

The existing literature on natural hazards and traditional communities in the Philippines is very sparse. Most of the studies dealing with this issue concern the 1991 eruption of Mt. Pinatubo and its impact on the Aeta communities living on the flanks of the volcano (Shimizu 1992, 2001; Seitz 1998, 2000, 2004; Gaillard and Leone 2000). Other notable works include the 12-volume compilation made by the Philippine Institute of Volcanology and Seismology (Phivolcs), the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), and the Ugnayang Pang-Aghamtao Foundation, Inc. (UGAT) during the late 1990s on disaster management among Filipino cultural communities (see Phivolcs et al. 1998, for a summary). This overall assessment covers 'cultural communities' of the Caraballo Mountains, Cagayan Valley and Batanes, the Igorots of the Northern Luzon Cordillera, the Negritoes of Luzon, Visayas and Mindanao, the Mangyans of Mindoro,

the Subanen of the Zamboanga Peninsula, the Manobo and Mandayas of Central Mindanao, the T'Bolis, Tedurays, Bagobos and B'laan of Southern Mindanao, and the Maranaw, Maguindanao, Tausug, Samal and Yakan Muslim groups. However, it chiefly focuses on coping mechanisms and indigenous mitigation strategies rather than on the impact of natural hazards on cultural and ethnic identity. Blolong (1996) also studied the cultural adaptation of the Ivatan of Batanes to typhoon hazards, while Insauriga (1999) concentrated on the awareness and preparedness of Bagobo communities to face different hazards. When seen in tandem with the larger spectrum of the international literature, it is possible to differentiate three models of response of Philippine traditional communities (Figure 1).

The first, so-called dominant, model (Kates 1971, Burton 1972, Mileti et al. 1975, Dynes 1976, Burton et al. 1992), maintains that traditional communities, which closely depend on natural resources for a living are fragile and incapable of overcoming the occurrence of large natural hazards by themselves. Environmental damage is usually so severe that affected communities are deprived of their main resources and are thus forced to rely on acculturating external aid in order

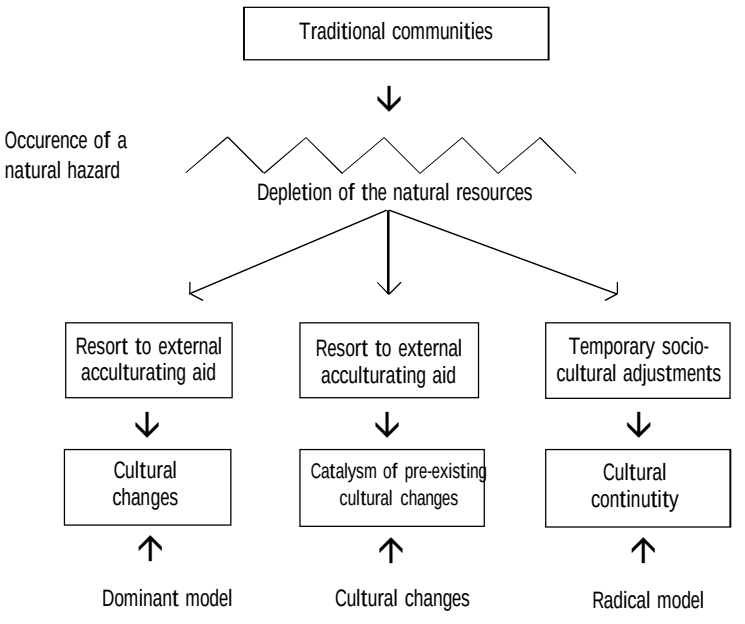

Figure 1. The Different Models of Response of Traditional Communities Following Natural Disasters

to survive. This model correlates the results of several studies conducted following the brutal awakening of Mt. Pinatubo among the Aeta Negrito communities who previously resided on the upper slopes of the mountain (Shimizu 1992 and 2001; Seitz 1998, 2000, and 2004; Gaillard and Leone 2000). The thick and hot pyroclastic and ash deposits blanketing the upper flanks of the volcano prevented the Aetas from going back to their ancestral lands and forced them to relocate on the foothills of Mt. Pinatubo, which were already occupied by lowland ethnic groups. This caused increasing and intense economic, social and political interactions that led the Aetas to integrate foreign socioeconomic and cultural elements including settlement pattern, religion, language, medicinal treatments, clothing, diet, land tenure, and farming activities.

The second model of response of traditional communities is based on a radically different thesis. Some researchers (Sjoberg 1962, Torry 1978 and 1979) have indeed demonstrated that traditional communities may be very resistant and capable of overcoming the occurrence of serious natural hazards by themselves. This approach asserts that the environmental consequences of large scale events force traditional communities to temporary or more permanent adjustments which do not modify the fundamentals of their social organization. In the Philippines, this model is fuelled by the studies of Blolong (1996) and Cayabyab and de Guzman (1998) among the Ivatans of the Batanes who are able to surmount by themselves the havoc brought on by repeated typhoons, thanks to a wide range of indigenous techniques: multi-cropping, crop compartmentalization, and crop rotation.

The third response model adopts a moderate and intermediary approach. This approach (Blong 1984, Oliver-Smith 1996) argues that natural hazards act as catalysts for ongoing cultural changes. The acceleration of trends of pre-existing acculturation has been witnessed among the Aeta communities that were inhabiting the lower eastern flanks of Mt Pinatubo before its violent awakening in 1991 (Gaillard and Leone 2000). Unlike their ethnic counterpart from the upper slopes of the volcano, the Aetas of the foothills were already living for a long time in close contact with lowland groups and American servicemen on duty at the neighbouring Clark Air Base. By further increasing the social, economic and political dependency of the Aetas on the lowland people, the eruption accelerated the diffusion of western socioeconomic references already widespread before the eruption.

In this short synthesis of studies dealing with the responses of Philippine traditional communities following the occurrence of violent and contemporary natural hazards, I distinguished three theoretical models. It is our contention that further empirical evidence implies that these require further critical reflection.

LIMITATIONS OF THE MODELS

The opposing conclusions of the models described above lead to a questioning of the validity of such generalizing approaches. Two issues may be raised. The first one, recently tackled by Hoffman (1999) and Torrence (2003), is the scale of temporal analysis. Indeed, socio-cultural changes viewed as major transformations a few months, years or even decades after the occurrence of a natural hazard may be seen as slight adjustments over the longer term. The example of the 1991 Mt. Pinatubo eruption and its impact on the Aeta Negrito communities is significant. Ten years after the eruption, the changes that occurred among the communities previously located on the upper slopes of the volcano may seem important (Gaillard and Leone 2000, Seitz 2004) but when placed in a longer temporal frame, the impact of this event appears to be far less significant. During their long history which may date back to the Pleistocene period, the Aetas have had to cope with major environmental and cultural disturbances, including several powerful eruptions of Mt. Pinatubo and earthquakes, climate changes, the arrival of the Austronesian agriculturists, the coming of the Spaniards, and finally the establishment of American military bases on their territory. Yet, they have managed to retain specific cultural traits that still distinguish them from the majority of Filipino ethnolinguistic groups today. Cultural changes and adjustments in the wake of the 1991 Mt. Pinatubo eruption, therefore, should be more nuanced and replaced within a longer temporal scale.

The second problem encountered when trying to model the cultural impact of natural hazards on traditional communities is linked to the difficulty of comparing different events. This trouble has its roots in the uniqueness of each case. During the last two decades, considerable attention has been given to this question in the hazard literature (e.g., Susman et al. 1983, Maskrey 1993, Blaikie et al. 1994, Hewitt 1997). Natural hazards like volcanic eruptions, earthquakes, landslides, typhoons or floods have different inherent characteristics such as diverse speeds of onset, temporal spacing and magnitudes. Moreover, they occur in very different geographical, social, political and cultural contexts that shape the responses and adjustments of the victims. The distinctiveness of the events and the dissimilarity of their contexts of occurrence lead me to question the existence of universal models or patterns of cultural response to natural hazards as those mentioned above. It seems that cultural changes are commanded by an intricate interrelation of several factors that vary in time and space, from one event to another. These factors are physical, sociocultural, geographical, and political in nature. The following discussion describe each of them in light of a new framework for approaching the cultural impact of violent and contemporary natural phenomena on traditional societies.

The nature of the hazard

I have already mentioned that natural hazards have different intrinsic characteristics. The magnitude and the temporal spacing of the hazards directly control the impact of such event on traditional communities. In the Philippines, several studies have demonstrated the capacity of such communities to deal with moderate-magnitude and recurrent phenomena like the frequent typhoons that sweep the archipelago during the rainy season. This is particularly true for the Ivatans of Batanes (Blolong 1996, Cayabyab and de Guzman 1998), the Igorots of the Northern Luzon Cordillera (Ramos 1998), the Mangyans of Mindoro (Rellin 1998), the Manobos of Central Mindanao, the Mandayas of Southeastern Mindanao (Villar 1998), the Yakan of Basilan, the Samal and Tausug of Sulu (Valeroso and Javier 1998) who developed a wide spectrum of indigenous practices to cope with these phenomena (e.g. adapted agricultural strategies, typhoon-resistant houses, typhoon shelters, seawalls, forest conservation, etc.). Conversely, the magnitude of the 1991 Mt. Pinatubo eruption, which led to significant short and middle-term cultural changes among the Aeta communities, was far greater. Moreover, the Aeta had to deal with an unfamiliar phenomenon because the eruption occurred after five centuries of volcanic inactivity.

The extent of damages also played a crucial role in the impact of natural hazards on traditional communities. In the case of the 1991 Mt. Pinatubo eruption, most of the Aeta villages were buried under several meters of hot pyroclastic and onward ashfall deposits, preventing the immediate reoccupation of the upper slopes of the volcano. Relocation downhill in the immediate vicinity of other ethnic groups, with whom acculturating interactions eventually occurred, was a must and no other alternatives were open to the Aetas. On the other hand, phenomena like typhoons and floods more easily allow post-event reoccupation of the stricken area thus helping the victims to recover promptly, as shown by the sample of the Ivatans of Batanes.

The sociocultural context before the event

The pre-event sociocultural context includes the level of acculturation, the relationships between the affected group and its neighbours, the diversity of livelihoods, the cultural attachment to the devastated site and the size of the affected community. The international literature indicates that the deepest cultural changes in response to the occurrence of a natural hazard happen among the most traditional communities. Among the most acculturated communities, the natural phenomenon rather acted as a catalyst for pre-existing processes. Following the 1991 Mt. Pinatubo eruption in the Philippines, the deepest sociocultural changes similarly occurred among the communities which were less acculturated before the eruption, while the most acculturated communities in 1990 underwent little adjustments to

the new environmental and socio-economic contexts (Gaillard and Leone 2000).

The second factor influencing cultural change among traditional communities is the amplitude of socio-cultural differences between the affected ethnic group and its neighbours, as well as the intensity of inter-group interactions before the event. It seems that the larger the gap and the less the interactions, the deeper the cultural changes. Following the 1991 eruption of Mt. Pinatubo, the Aetas from the upper slopes of the volcano, who discovered the way of life of the lowlanders during their stay in the evacuation centres, were the most permeable to cultural change. Conversely, changes were less profound among communities from the foothills of the mountain that had long interacted with neighbouring groups.

The diversity of livelihood is another factor of cultural resistance. The communities that are most vulnerable to cultural changes seem to be those relying on a unique livelihood. It is evident that communities relying exclusively on the natural resources available in their immediate environment are much more vulnerable in the event of partial or total destruction of these resources. In the case of the 1991 Mt. Pinatubo eruption, uphill communities exclusively dependent on agriculture for their living were rendered helpless by the destruction of their fields by metres of pyroclastic deposits. On the other hand, the communities located on the foothills of the volcano which used to rely on several livelihoods turned out to be less affected by the eruption. The wider range of resources allowed them to rely less on external and acculturating support. Similarly, the Ivatans of Batanes plant a large variety of crops guaranteeing food security in the event that some would be damaged by typhoons (Blolong 1996, Cayabyab and de Guzman 1998). This strategy prevents them from depending on external assistance in times of crisis.

The cultural attachment to the site devastated by a natural hazard is also decisive. In the cases of Mt. Pinatubo, the mountain plays a major spiritual role and is the centre of traditional religious beliefs (LAKAS 1991). The post-disaster relocation away from the slopes of the volcano constituted a painful cultural rupture for the Aetas communities affected. Likewise, T'boli people resettled following the 1976 tsunami and the 1995 floods that devastated the southern coast of Mindanao displayed a strong attachment to their homeland and rapidly returned to their former settlements after the events (Phivolcs et al. 1998).

Finally, the size and extent of the community affected seem to be directly linked to cultural change. If the whole community is hit by a hazardous natural phenomenon, resistance to cultural changes looks unlikely, especially because of the absence of communities that are able to play the role of guardian of the pre-event traditions. The 1991 Mt. Pinatubo eruption did not spare any Aeta community (Seitz 1998, 2000,

and 2004; Gaillard and Leone 2000). All the Aetas experienced the evacuation and resettlement centers where contacts with the lowlanders first occurred for the uphill communities. The absence of any intact village, which could have maintained Aeta traditions, did not allow a retreat toward a preserved sociocultural environment.

The geographic setting

The importance of the geographic setting in cultural change following the occurrence of natural hazards is directly linked to the magnitude of the event, the extent of damage and the pre-event sociocultural context. It essentially includes the existence of enough space in homeland-like environment for relocation without encroachment upon other ethnic groups and cultures. In the case of the 1991 Mt. Pinatubo eruption, there was definitely no space available in homeland-like environment for spontaneous relocation. The resettlement sites selected by the government encroached on lowlander territories and favoured contacts between Aetas and their neighbours. Foothill sites, where other Aeta communities spontaneously resettled, also trespassed on lowlander's lands (Gaillard and Leone 2000, Seitz 2004). The role of the geographic setting would be even more evident in the event of a natural phenomenon striking a small island, as has occurred elsewhere in the world (e.g. Tristan de Cunha) and that might happen in the Philippines.

The rehabilitation policy of the affected area set up by the authorities

The fourth and last factor affecting cultural change among traditional communities is the post-event rehabilitation policy pursued up by the authorities. Several studies all over the world (1976 Guatemala and 1982 Yemen earthquakes, 1994 eruption of Mt. Rabaul in Papua New Guinea, 1943-1952 eruption of Paricutín volcano in Mexico) have shown that some cultural changes have been premeditated by the authorities in charge of the rehabilitation of the affected areas. In the Philippines, following the 1991 Mt. Pinatubo eruption, some government officials were also boasting of trying to "civilize" the Aeta through the rehabilitation program set up following the disaster, especially through the resettlement policy and social programmes (Bennagen 1996). However, if it is true that education within the resettlement centres contributed to enlarging the cultural references of the young, major socio-cultural changes among the Aeta communities did not occur directly in response to inputs of the government but rather as a progressive process due to geographic proximity which led to increasing interactions with external lowland culture. This is particularly evident because a large number of Aetas spontaneously chose to leave the relocation centers to settle on available lands in the surrounding foothills (Gaillard and Leone 2000, Seitz 2004).

The post-event rehabilitation program cannot be detached from the national government policy toward traditional communities. In most developing countries severely affected by natural hazards, the recognition of traditional communities is often non-existent. For example, at the time of the 1991 Mt. Pinatubo eruption, there were no specific governmental guidelines to protect and defend ethnic minority rights in the Philippines. Hence, it was most unlikely that the Philippine government had appropriate measures for the preservation of the Aeta culture at this time.

CONCLUSION

The previous discussion described several factors influencing the responses of Philippine traditional communities in the face of violent and contemporary hazardous natural events (Figure 2). It is evident that the nature of the hazard, the pre-event sociocultural context, the geographic setting, and the rehabilitation policy set up by the authorities greatly vary in time and space, from one case to another.

The nature of the hazard is certainly one of the most significant elements because it largely conditions the existence or absence of a homeland-like-environment for relocation (geographic setting) and the rehabilitation policy set up by the authorities. It turns out that volcanic eruptions, due to their relative rarity, their violence and the large areas covered by volcanic deposits are among the most powerful vectors of cultural change among traditional

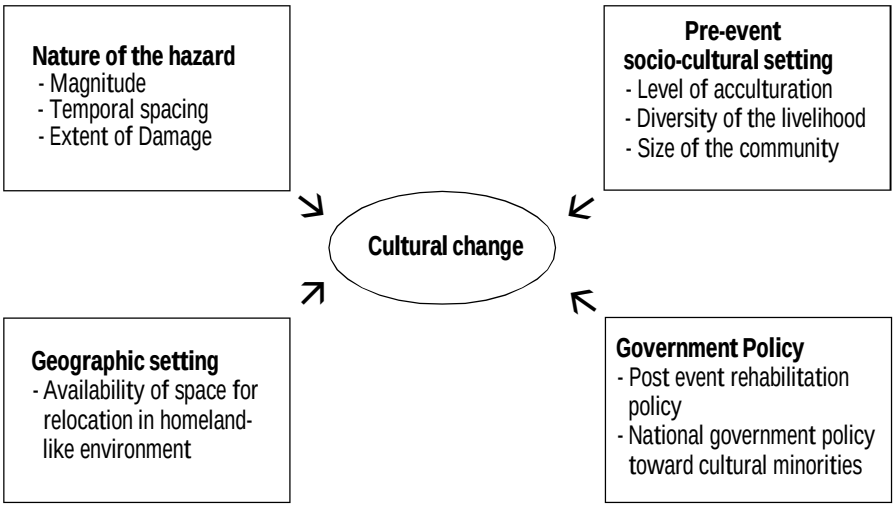

Figure 2. Factors of Cultural Change among Traditional Communities

communities. This is clear in the case of the 1991 Mt. Pinatubo eruption and its impact on the Aeta ethnolinguistic group. Conversely, traditional communities seem to be very resistant to recurrent phenomena like floods or tropical typhoons, which allow the immediate reoccupation of the stricken site, as shown by the Ivatan inhabitants of Batanes Islands.

The capacity and latitude of response of traditional communities to a given hazardous natural event rather lies in the pre-event sociocultural context. Indeed, the level of acculturation, the relationships between the affected group and its neighbours, the diversity of livelihoods, the cultural attachment to the devastated site and the size of the community affected are of great importance in constraining or facilitating the recovery of traditional communities. Small, "very traditional," isolated, and exclusively environment-dependent communities seem to be the most exposed to cultural change in the event of the occurrence of a hazardous natural phenomenon while larger and fairly acculturated groups look less vulnerable.

This remark regarding differentiated vulnerabilities leads to the larger debate of coping strategies and resilience to hazardous natural events. Burton et al. (1993: 221) have named "loss acceptance" the mode of coping of traditional communities. This means that the loss is recognized and tolerated. They further note that "people prefer to bear known ills rather than take action the outcome of which may be equivocal or uncertain" (Burton et al. 1993: 223). The sociocultural mechanisms leading to such behaviour remain to be explored and research perspectives at the societal level require further examination.

Finally, the relatively easy differentiation of the hazards and pre-event sociocultural contexts mentioned above should not hide the fact that cultural changes in the wake of natural hazards are deeply anchored in local sociocultural and political contexts. These deserve the proper attention in the larger field of natural hazard management. Limited for a long time to the transfer of experience, knowledge and technologies from industrialized to developing countries, natural hazard management programs are now focused toward a more local approach of the problems (see Chester 1993 and Chester et al. 2002, for a comprehensive account). From this point of view, theoretical models, like those existing to evaluate the cultural impact of natural hazards on traditional communities, are not as useful from an instrumentalist perspective. Instead, I highlight a need to assess the local variations of several factors as detailed in the present paper. Together, these factors may constitute an alternative framework for anticipating the consequences of future hazardous natural events.

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2. Include a brief abstract of 100-200 words summarizing the findings and at most five key words on a separate sheet of paper (without author information).
3. Title, author's name, affiliation(s), full address (including telephone and email address) and a brief biographical note should be typed on a separate sheet.
4. *Notes* should contain more than a mere reference, although it is recommended to use notes only for substantive observation and to limit the length. They must be numbered serially and presented at the end of the article in a separate endnotes section that appears before the References.
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   (Lynch & Makil 1968)
   Zialcita (2005)

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   Source: Saloma 2001

   "After all," he said, "*pinoy* can be seen along national lines."
   Source: Saloma 2001

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Scholars (Karaos 1997, Porio 1997, Tapales 1996)

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Article from the Internet

Mershon, D. H. 1998. "Star Trek on the Brain: Alien Minds, Human Minds." *American Scientist* 86, 585. Retrieved 29 July 1999, from Expanded Academic ASAP database.

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