

# 'VULNERABILITY': A MATTER OF PERCEPTION<sup>1</sup>

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*Disaster response agencies increasingly use the concept of 'vulnerability' to analyze processes and conditions that lead to disasters, and to identify disaster responses. Because no common definition of 'vulnerability' exists, agencies use the concept in the way that best fits their usual practice. Ironically, 'vulnerability' is not a concept that grassroots communities use. They approach recurrent 'adverse events' as part of 'normal life', while rare or new disasters are dealt with from a perspective of survival. People take risk-related decisions from a range of alternatives based on local knowledge, past experience, experiments, opportunities and existing coping mechanisms. While outsiders might label two households as equally vulnerable – because they live in apparent similar conditions – the two households might still perceive risk differently and, as a consequence, prefer different risk reduction measures. The degree of perceived risk varies greatly among households and depends on class, gender, location, and other particular conditions shaped by economic, social and political processes. Communities at risk would benefit from a framework that links poverty, disaster risk reduction and development efforts. People's participation is essential and should be empowering to address the root causes of their vulnerability.*

## **Various views on 'vulnerability' and its users**

Concerned by the increasing number and impact of disasters, the International Decade for Natural Disaster Reduction (IDNDR) was initiated in 1990 to serve as catalyst for disaster reduction. One of its major goals was reducing vulnerability to natural disasters, "requiring concerted and coordinated efforts of government, UN-system organizations, the world's scientific and technical community, volunteer organizations and educational institutions, the private sector, the media, and individuals at risk. Vulnerability assessment....[is] essential" (United Nations IDNDR, 1992). The international community was alerted to the fact that if we ever want to control and prevent disasters, we must be able to assess and identify vulnerabilities in order to design timely, affordable and effective strategies for reducing the negative effects of disasters (Anderson, 1995). Most disaster response agencies now use the concept of 'vulnerability' to analyze the various factors and processes underlying the impact of disasters on society. Most of the agencies further recognize that vulnerability is a bigger concern for the poor, and that the most vulnerable sectors in society need special attention. This does not mean, however, that disaster agencies share a common understanding or definition of 'vulnerability'. It largely depends on the user and its role in society, what definition is acceptable and attached to 'vulnerability'.

Various authors have come up with historical overviews on how understanding of vulnerability has shifted and enlarged, or how different actors perceive disasters and vul-

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nerability (Cuny, 1983; Anderson and Woodrow, 1989; Cannon, T. 1994; Anderson, 1995; Smith, K, 1996). In short, three different views and resulting strategies to address vulnerability are distinguished:

1. *Nature as cause → technological, scientific solutions*: this view blames nature and natural hazard as the cause of people's vulnerability, which fluctuates according to the intensity, magnitude and duration of external shocks. Vulnerability results from hazards (including intensity) and risk (exposure to events, measured in terms of proximity). To reduce vulnerability, systems for predicting hazards, and technologies to enable human structures to withstand negative impacts are designed and applied (equipment to monitor seismic activity, weather forecasting, remote sensing for drought and fire monitoring, water control systems, building code regulations, etc.)
2. *Cost as cause → economic and financial solutions*: in spite of increasing technological and scientific capacity, people continue to suffer, because prediction and mitigation technologies are so costly. Economists develop and still improve methods to assess the costs of losses from disasters to calculate whether, when, how and where reducing vulnerability is viable. In this view, vulnerability will be reduced if national governments adapt safety nets, insurance, calamity funds and provide financial assistance to build up people's assets (World Bank, 2001:135).
3. *Societal structures as cause → political solutions*: this view observes that disasters have differential impact on people who live in hazard-prone areas. It is not only the exposure to hazards that puts people at risk, but also socio-economic and political processes in society that generate vulnerability. These create the conditions that adversely affect the ability of communities or countries to respond, to cope with or recover from the damaging effects of disaster events. These conditions precede the disaster event, contribute to its severity and may continue to exist even afterwards (Anderson, 1989:10; Blaikie, 1994: 9). "Reducing the vulnerability of the poor is a development question, and such a question must be answered politically" (Cuny, 1983:7). In this perception, a safer environment can only be achieved if disaster response changes the processes that put people at risk. The long-term solution lies in transforming the social and political structures that breed poverty and the social dynamics and attitudes that serve to perpetuate it (Heijmans and Victoria, 2001: 16).

The three views are not exclusive. In big aid agencies more than one view exists among policy makers and implementers. Most disaster response agencies combine the first two views in their analysis and actions, like most international humanitarian agencies. They perceive 'vulnerability' as the result of both external dynamics and lack of financial capacity. In their analysis, poor people are plagued by critical trends, shocks and seasonal problems, which lie far beyond their control. To help them, support focuses on relief and disaster prevention, like scientific forecasting and warning equipment to give vulnerable populations time to move out, and on financial assistance to build up people's assets – including insurance (DFID, 1999: sheet 2.2; Annan, 1999; Bender, 1999). The third view is mainly supported by environmentalists and activists.

### ***Absence of people's perspective in vulnerability assessments***

Although most actors agree and recognize that poor people are the most vulnerable and require special attention, none of the three categories mentions explicitly how people at risk experience and understand disasters. This invisibility will be illustrated by the case

of the Indonesian fires of 1997-98, which explains the various actors' perceptions of the fire hazard, its causes and their proposed solutions (*box 1*).

**Box 1: Interpretation of the 1997-98 fires in Indonesia and its consequence for disaster response (Harwell, 2000)**

During the El Niño drought in 1997-98, fires devastated Indonesia's forests, creating a vast shroud of smoke that reached as far as mainland Southeast Asia. The Indonesian government, international donors, environmental activists and local communities interpreted the causes of the fire differently, and therefore, their solutions to respond to the fires also varied.

The majority of the **Indonesian government officials** blamed El Niño and global warming – caused by industrialization in the First World - for the disaster. They saw fires as a result of unpredictable and uncontrollable nature, and of insufficient development to suggest that if the government had more modern technology, it could predict nature more precisely and respond more quickly. Government, therefore, emphasized the need for better technology to predict, monitor and address fires. This interpretation of the fires was blind for human factors causing the fire, and lacked the political will to address these.

**International donors** conducted wide-spread damage assessments, mainly through remote sensing – satellite photos showing area, thickness and content of smoke, and location of hotspots. Their interest was to estimate the impact on wildlife and natural resources. No one had collected any systematic field data of impacts on local communities, or investigated the cause of the fires. In fact, they kept silent about the role of the plantation sector in the fires, unwillingly to mix in "local politics". Instead they constructed an analysis that Indonesian forests are of global interest, a source of priceless biodiversity. It is nature that is most vulnerable in this case. People inhabiting the forests are poor and degrade their environment in order to survive. Therefore, what the Indonesian government needs, is modern technology (like GIS) to slow the process of environmental degradation and to protect valuable resources. This interpretation blames poor local people for the fires, not the wealthier plantation sector.

The **local NGO community** revealed – using remote sensing as well – that the majority of hotspots originated on logging and oil palm plantation land. Since the 1960s, Suharto's economic development initiatives, supported by the IMF and World Bank, promoted capitalization of large scale 'natural resource production'. Government policies allowed plantation owners to use fire as a cheap and effective means of clearing land to establish plantations. This process of forest exploitation contributed to the outbreaks of fires, more so since the government lacked the political will to enforce the 'Zero Burn' legislation enacted in 1995 prohibiting the use of fire in commercial land clearing. This process created ecological and social landscapes vulnerable to fire. The NGO community blamed the plantation sector for the fires, as well as the inequitable government forest practices. Although the NGO sector advocated for local indigenous control of resources, it represented 'the forests that cannot represent themselves' rather than the local people. In this context they envisioned reforms of forest management policies to address fires and further environmental degradation.

While the rest of the world focused on the smoke visible from satellites, on the ground **farmers** endured the hardship caused by the fires. They lost both their gardens and fallback resources. The fire had destroyed everything, including their life savings invested in the landscape. Farmers blamed the land clearing activities of adjacent oil palm plantations for the fires. They even believed they were victims of arson, a means employed by plantation owners to displace farmers from their land in order to stake claims to locally-held lands. In cases where timber or oil palm plantations caught fire, the owners could not count on local help to extinguish the flames, indicating that the roots of the disaster lie with struggles over ownership of land and forest resources. It is not poverty or the 'slash and burn' practices of poor farmers that set the degradation of nature in motion, but the greedy and unjust behavior of concessionaires, politicians, and law enforcement officers involved in the conversion of forests to plantations. This created the vulnerable ecological and social conditions for the fire disaster.

The case of the Indonesian fires reveals that the responses - forecasting technology, remote sensing and reforms of the government's forest management policies – ignore the role of the palm oil and timber sectors and related government departments, which are in fact responsible for creating the onset of the fire disaster. The IMF even included

as a condition of its 'rescue package' loan (following the 1997 financial collapse) the further expansion of the oil palm sector and the inclusion of foreign investment in the forestry sector (Harwell, 2000:325). In this way existing relations of power are being reproduced. None of the actors involved considered the local people's views and their situation important, since it would only put more oil on the conflict (and fire). Fire in Indonesia will continue to happen, if economic and political power relations do not change.

As vulnerability reduction and targeting the most vulnerable groups are in fact related to social order and politics, Bender (1999) argues that there is little reason to expect that the IDNDR would have dealt with natural disaster reduction in a serious way. For many countries and donors, vulnerability reduction is too political.

At this point, I would like to raise some issues regarding 'vulnerability' that need further clarification and discussion. The first issue is how communities – (repeatedly) affected by disasters - view and respond to 'vulnerability'. This issue is relevant since most of the aid agencies just make assumptions regarding local people's needs and priorities, and treat them as recipients or beneficiaries of their programs, not as creative actors in disaster risk reduction. The second issue is what the consequences are of local people's perceptions and actions for disaster policies in general, and assessment tools in particular. The third issue is of a different level and relates to the political nature of the concept: if most disaster management agencies and governments ignore the social and political origin of disasters, how can disaster risk reduction ever happen?

This paper does not aim to present clear-cut answers, but merely reflections from a practitioner's point of view. While working with grassroots communities in disaster-prone areas – mainly in the Philippines and Nepal - I often encountered contradictions between local people's behavior and preferences on one side, and the disaster policies and practices of aid agencies (including donors) on the other side. Vulnerability reduction and the selection of appropriate measures is often a competition between different actors, who seek to realize their needs and interests.

### **Local people's perception of 'vulnerability'**

Hazards have always been part and parcel of the world's reality, and populations inhabiting hazard-prone areas adapted strategies to deal with extreme events, using their own capabilities, skills, talents, knowledge and technologies. Learned from their ancestors and their own experiences, these adaptation strategies are made part of their traditions and culture (Blolong, 1996: 15). When hazards strike, people have always been ready to cope and did not rely much on support and assistance from outsiders such as government. In this historical perspective, local people have no concept of 'vulnerability'. In local dialects, there is seldom an appropriate translation for the term.

Unfortunately, this picture is disappearing. Political, demographic and global economic processes have put adaptation strategies under great pressures and given rise to vulnerability (and reproduction of vulnerability over time), affecting the allocation and distribution of resources between different groups of people (Blaikie et al, 1994: 24). The farmers in Kalimantan, Indonesia - affected by the fires in 1998 -, have lived there for generations making their living from a combination of subsistence and commercial agroforestry including swidden agriculture, rubber, pineapple and rattan gardens. In times of drought, excessive rains or pests, they have always had other resources to fall back on. With the arrival of the oil palm plantations in the area, competition for land and

forest resources intensified. And arson – allegedly applied by plantation owners – resulted in destruction of farmers' savings and their inability to cope with extreme pressures. And this was unprecedented (Harwell, 2000: 328).

Similarly, local communities in the uplands of the Philippines have been increasingly exposed to the negative impact of typhoons and drought since the seventies. They blame the government's logging policies, mining operations and the construction of hydroelectric dams for the increasing occurrence of flashfloods, landslides, pollution of water and fish kill. Nowadays, local people also observe that even normal monsoon rains trigger adverse disastrous events like landslides and floods, which never occurred before. In their view, the conceptual difference between a typhoon (*hazard, extreme event*) and monsoon rain (*normal climatic condition*), has become negligible, since effects at community level have become similar. The vulnerable condition in which people live, can now turn not only extreme events, but even normal events into disaster situations.

Another concern for local communities, and perceived as more disastrous than natural hazards, are the government's 'development' projects like dams for electricity generation and irrigation, mining operations, plantations and recreation areas that require conversion of prime agricultural land to industrial and commercial uses<sup>i</sup>. These projects might favor national and global interests; local communities, however, are not consulted, but get displaced, losing their livelihoods and rights to cultivate (ancestral) lands<sup>ii</sup>. The San Roque Multi-Purpose Dam Project, currently under construction in Benguet Province, Philippines, will displace 61,700 individuals (IBON, 2000). These kinds of projects with immediate negative effects on local poor communities are referred to as '*development aggression*'<sup>iii</sup>, and are considered by local people as human-made disasters. It is much more difficult to cope with the adverse effects of '*development aggression*' than with those of a typhoon; typhoons destroy crops, houses and infrastructure, but do not necessarily undermine the basis of people's means of survival. Displacement, as a result of '*development aggression*', deprives people of their land which is the most crucial resource to sustain their livelihood. Government or private investors offer compensation that is far below the amount needed to rebuild a livelihood elsewhere, and land is not made available.

It is commonly accepted among researchers and disaster managers that development creates new forms of disasters, for instance technological hazards and pollution. But '*development aggression*', causing displacement of people, is not recognized as a human-made disaster, except by the affected communities themselves and a few supportive local NGOs. Discussing the issue results either in a political debate or in a conceptual discussion of terms and definitions.

In the 'disaster pressure model', Blaikie et al (1994) extensively explain the progression of vulnerability from root causes through dynamic pressures resulting in local unsafe conditions. In this model, government policies and programs are considered the result of unequal power relations that create vulnerability and unsafe conditions at the local level. These deprive people of the resources to cope with extreme events (Bankoff, 2001, 7). According to the 'disaster pressure model', the *decision* to construct a dam might be considered a root cause of creating unsafe conditions at local level, particularly the threat of flashfloods in case the dam breaks. But the actual forcible *eviction* is a disaster, according to the affected families; even more so because no decent and permanent relocation settlement is provided for<sup>iv</sup>. In this situation people's usual coping strategies

have become irrelevant. The only valid and appropriate response local people see is political activism to oppose the kind of development that violates their human rights in all dimensions – economic, social, cultural and political -, and to promote an alternative development agenda.

In a fast changing environment, local people experience that traditional coping strategies are no longer valid or appropriate. They continuously look for new ways to adjust their livelihood strategies with the aim of reducing risk, sustaining their livelihood, and avoiding entering irreversible strategies, i.e. strategies that undermine the basis of their means of survival (Walker, 1989; 50). Although local people do not use the concept of 'vulnerability' to describe their worsening situation, they feel the stress, face difficulties, talk about 'risks', and make risk-taking or risk-avoiding decisions. They do not only take into account the possible exposure to danger and future damages (i.e. what outsiders generally refer to as 'vulnerability'), but also their capacities, options and alternatives, and the implications of their decisions. It is important that outsiders understand both sides that make up local people's perception of risk, rather than analyzing and measuring their vulnerability with outside criteria. Outsiders might label two households, who live in similar conditions, equally vulnerable. But the two households might still perceive risk differently and, as a consequence, prefer different risk reduction measures. Examples in the following sections will illustrate this point.

### **People's perception of risk**

For a long time, there was a strongly defended belief by scientists, and also disaster managers, that there was such thing as 'objective' risk. It was just a matter of convincing and warning the public of the scientific objective risk 'reality' (Löfstedt et al, 1998: 4). Scientists and experts calculate risks, using statistical formulas based on probability and negative impacts of past hazard events, while they treat people's risk behavior as irrational. Sociologists criticized the idea of objective risk. They argue that perceptions of risk are not irrational, but must be seen as individual judgements under uncertainty. People make the best choice from several alternatives, and take actions regarding hazards based on their personal perception of risk rather than on some objectively and scientifically derived measure of threat (Smith, 1996: 55; Löfstedt et al, 1998: 4).

This paper presents several examples of how local people perceive risks, and what they do to reduce them. The examples reveal aspects important for outsiders, who tend to imagine how at risk others might be, instead of understanding how local people themselves assess risks. One aspect is the perception of the nature and behavior of hazard events: is the hazard occurrence perceived as 'chronic', 'part of normal life', 'rare', or is the hazard threat new and never experienced locally? Factors like local knowledge, past experience, household composition according to gender and age, and existing coping mechanisms determine the opportunities people have to reduce risk. People's risk perception is further determined by the experience they have had in the past with outsiders, such as local government officers, aid agencies, warning signals, and other affected communities.

Two examples (*box 2 and 3*) show how local residents perceive 'objective' predictions and warnings from the government. Difference in perception often creates tension when provincial government gives evacuation orders to local communities without prior consultation with local authorities or people at risk. The two examples illustrate how past experiences with floods, credibility of the warning source, and the nature of preparedness and coping measures influence the risk perception of local communities.

**Box 2: Government flood forecasting in Canada perceived by local residents (Buckland, 1999)**

During the 1997 Red River Flood in Canada, the provincial government ordered local authorities to evacuate citizens to safe places. Local authorities, however, had difficulties in following the provincial evacuation order, since most citizens refused to evacuate. In return, the provincial government used exaggeration and intimidation to encourage the evacuation, like arguing that a four-to-six-foot 'wall' of water was approaching the communities along the Red River. Local residents, who had previously experienced Red River floods, correctly understood prairie flooding to progress slowly, and not as a dramatic 'wall' of water.

When water levels rose, the majority of communities protected by a dike complied with the evacuation order, while communities outside the dikes, i.e. more at risk, mostly ignored the warning. These people did not fear any loss of life, but were concerned about their properties. Experience with past floods evolved into precaution measures like elevated flood-paths, and sandbag-dikes. These flood-mitigating precautions, supported by the same government, involve labor-intensive monitoring. This was the main reason why local residents refused to evacuate.

Local authorities, on their turn, considered other factors when the evacuation order from higher level confronted them: if they would follow the order, they could lose community support. If they disobeyed, they feared reduced rehabilitation funds from higher levels.

**Box 3: Risk perception of farmers residing on the slopes of Mt. Mayon volcano, Bicol, Philippines**

Mt. Mayon is the most active volcano in the Philippines, with 46 eruptions since 1616. The last major eruptions happened in 1984, 1993 and in 2000, while threats occur almost yearly.

Living on the slopes of Mt Mayon volcano in Bicol, Philippines, gives marginalized farmers the opportunity to produce food, even without secure land titles. Although Mt Mayon is a very active volcano, the simple fact of earning a livelihood increases the level of tolerable risk of being exposed to a possible volcanic eruption. This is one of the main reasons why people tend to ignore evacuation orders, when the likelihood of eruption increases and an incentive of relief is offered in evacuation centers. People only move if they actually see smoke, ash falling, lava flowing and stones coming down the slopes, i.e. when the highest alert level is reached. In most cases, people are prepared for evacuation and have arranged for transportation in advance, but postpone evacuation as long as possible, because they know that living conditions in evacuation centers are even worse (congested, lack of water, insufficient food and livelihood options). More people die in evacuation centers because of poor conditions, than due to the immediate effects of the eruption. So the benefits of each day's work on the farm near a 'trembling' volcano are perceived as less risky than the physical exposure to the actual eruption, and 'being safe' but hungry in the evacuation centers.

While governments put emphasis on expensive scientific methods for predicting volcanic eruptions to improve 'safety', and then on relief assistance (response focuses on natural hazard), poor residents would have been better off, if the government provided them with land security in safer areas (response focuses on vulnerable condition and root causes). In that case, they would not need to farm on the volcano slopes prone to mudflows every rainy season (risk of mudflow and crop damage is much higher than the probability of volcanic eruption). But the political will of governments to genuinely reduce disaster risks is lacking.

People make risk-taking or risk-avoiding decisions based on individual circumstances and experience. It is this experience which determines perception and both hazard 'victims' and hazard managers will respond to disaster risk in different ways according to their personal understanding and experience (Smith, 1996: 66). To identify effective risk reduction measures, perceptions of both local communities and hazard managers should be considered and combined (e.g. a combination of scientific and indigenous warning signals can lead towards a more reliable and appropriate warning and evacuation plan).

Besides differences in risk perception between local communities and disaster agencies, risks are also viewed differently among people from the same community. Some find certain events or situations unacceptably risky and will do their utmost to avoid being involved, while to others the same event may offer opportunities or is a non-issue, something that can be ignored (Young, 1998: 14).

*Box 4: Risk reducing behavior to deal with changing environment of various upland community members in Panay Island, Philippines*

Upland communities in Panay used to grow traditional rice varieties (TRV) and corn in their '*kaingin*' ('slash and burn') farms. In the early nineteen-eighties these communities started experiencing drought periods, which became more frequent during the nineties. They all blame the large scale logging activities by the elite lowlanders for the increasingly vulnerable conditions for drought. To a lesser extent they think that forest also disappeared because of the influx of more settlers from the lowlands, due to land scarcity over there. The uplands of Panay were never exposed to the damaging effects of typhoons, but since the mountains get more denuded, strong typhoons now damage crops and bamboo. Although the upland communities were confronted with similar events and processes, they developed different strategies to respond to these developments:

- *Settlers in Maasin District, Iloilo Province, Panay*

This area is relatively accessible from the lowland and nearby Iloilo City, the political center of the island. This explains why the area is almost denuded. Farmers no longer practice 'slash and burn, but shifted to permanent farming (TRV and corn). In the eighties, they 'discovered' that through making '*kahon*' (literally meaning 'box' and refers to a local version of rice terraces without canals, but constructed in such a way that they can hold and maximize rainwater for rice production) they could better cope with drought conditions. Farmers developed these boxes where suitable, and grow a combination of TRV and High Yielding Varieties (HYV). The advantages of growing HYV is that it yields faster than TRV, and by optimizing the available water in '*kahon*', a second crop is sometimes possible. They practice direct seeding because there is insufficient water for seedbeds. Farmers make risk-taking decisions to optimize usage of their resources, considering drought and typhoon occurrence: TRV means less expensive inputs but only one harvest after six months. HYV means more expensive inputs like fertilizer, pesticides, and herbicides, but you can gamble on two harvests in the same period. Most farmers risk growing HYV, while on land unsuitable for '*kahon*' they continue to grow TRV and increasingly corn. In case it does not rain for the second HYV crop, they plant mung beans and corn. For additional income families are involved in bamboo weaving, and charcoal production. Drought and typhoons are perceived as part of normal life. People use all their resources to fight hunger.

Although this description of people's coping strategies is typical, among community members you find different versions of these strategies, depending on family particularities and available resources at household level. These influence risk perception and decision-making on how they can best reduce risk:

- Families who are relatively better off and own livestock and working animals, cultivate a relatively larger area of corn. Corn is used to feed animals, which can be sold in times of crisis (a form of savings).
- Families with grown-up sons prefer to earn income through seasonal migration, and do not plant HYV, which is considered more risky than out-migration.
- A female single parent with six grown-up children plants HYV only, because she has control over sufficient labor, and it is the fastest way to produce rice. Additional income comes from three children working in Iloilo City (bakery), and from bamboo weaving.
- A young couple with small children grows HYV, TRV and corn. Farming is their main source of income. For additional income they get involved in (illegal) charcoal making (male) and bamboo weaving (female) rather than out-migration. They do not like to leave small children behind.
- A sharecropper family with small children only grows TRV and corn. They have no resources to buy herbicides needed to grow HYV. He provides paid labor on other farms.

In 1990-91, the farmers experienced a drought period of more than 10 months, causing their coping strategies to fail. They received assistance from a local NGO who perceived the drought problem as a problem of shortage of seeds. A Community-Based Seed Bank Program (CBSBP) was conceptualized and implemented to enable farmers to save seeds for the next planting season. The NGO failed to



analyze the nature and behavior of drought in the past, and how farmers have developed strategies to mitigate effects of drought. Furthermore, the NGO did not recognize the farmers' HYV strategy as viable: it condemned the farmers' solution as environmentally and economically unsustainable. Besides, HYV is not a drought-resistant crop, like TRV, corn, peanuts, or other alternative crops. Farmers would have preferred assistance to develop a marketing strategy for their bamboo products. But they cooperated with the NGO, since they also desperately needed seeds to plant. The CBSBP was not a success, however. Only in one community (out of 18 communities) were farmers able to store seeds after the harvest. But these were used to feed the family before the next planting season.

- *Indigenous tribes in Carbasana, Capiz Province, Panay*

These communities still practice '*kaingin*', a rotating slash and burn system, to grow corn. The area still has some forest coverage. People plant and harvest corn only once a year, and this is their main source of food. The area is prone to drought and rat infestation, which often destroys the only crop they have. As a result they regularly face acute food shortage and people depend then on seasonal out-migration. The area, however, has the potential to be developed into permanent farms like rice paddies or contour farms. Existing capacities like available water sources that can be tapped for irrigation or establishment of fishponds, available labor, the motivation to learn new farming techniques, and the community's land use management plan can be built upon.

To mitigate the effects of crop failure due to drought and rat infestation, i.e. acute food shortage, the community, together with the support of a local NGO, identified the need for working animals, farm implements like plough and shovels, seeds and training on various sustainable agriculture techniques appropriate to the area. Through these inputs a shift in farming systems could be realized, making farmers less dependent on the '*kaingin*' system, which is no longer sustainable, and increasing the number of harvests through diversification of crop production over different seasons.

In a period of two years, most farmers developed ½ to 1 hectare of rice paddy, and could establish eight to twenty contour lines on suitable slopes according to the farmers' land use plan. In this period they experienced again one crop failure; the first rice crop in the paddies was eaten by rats. Farmers say that the biggest achievement of this mitigation response is that the risk of crop failure has been reduced. If one crop fails, they still can harvest products during the two other seasons. As a result the number of months of food shortage people face has been reduced.

- *Internal refugees in Barangay Osorio, Remegio, Antique Province, Panay*

The farmers in Osorio used to practice the same farming system as the farmers from Maasin district to cope with drought. However, in 1985, when military operations intensified, farmers left their original community and evacuated to Osorio, which is a day's walk away. In 1988-89 a military detachment came in Osorio and imposed a curfew and food blockade. People were not allowed to cultivate their farms and became dependent on wage labor and seasonal migration to Negros' sugar plantations. In 1999, the farmers still live in Osorio, because despite the departure of the military detachment, it is still not safe to return to their original farms. Only one-third of the families, whose farms are located at about four hours walk, are farming again, but are not able to fully restore their farms, since they lack working animals and tools. Most of the families depend for their meals on wild crops, like *kayos*, and seasonal farm work in the lowlands of Antique and on sugar plantations in Negros. For most of the year they try to survive on one meal a day. Almost all children are malnourished. Under such circumstances addressing drought is not a priority for people. Their priorities are protection against the greater risks of disease, child mortality and achieving peace and order.

Box 4, providing examples of people's responses to drought, shows that there is not one universal response to a particular disaster, even if communities are located in apparent similar conditions. Moreover, people affected by disasters do not allow themselves to become dependent on external support for their livelihood. Even if ecological and physical conditions become hostile, like the lahar flows after Mt. Pinatubo's eruption in the Philippines, or after experiencing militarization and long-term displacement, communities prefer to depend on their own capabilities and on whatever resources remain. They explore coping strategies that provide for immediate food availability, combined with strategies that ensure livelihood security on the long-term (Mula, 1999: 138). They 'calculate' risks in a multi-dimensional way based on personal circumstances. These

include available resources to feed the family, the moment in the farming calendar (planting season, harvest time, etc), family composition (age and gender) to consider off-farm work, location and escape routes, education and skills of family members, past experience, and fall-back mechanisms. They will make a choice from which they expect optimum benefit and less risk, even if they do not know all the consequences of their choices. Coping strategies are also the result of a process of experiments and innovation through which people build up skills, knowledge and self-confidence necessary to shape and respond to their environment (examples in box 4). This provides people with a sense of 'safety'. Local people approach their circumstances beyond the disaster and emergency paradigm. Even if they are not confronted with disasters, they face many risks like food shortage, diseases, malnutrition, or eviction from the land they till. Hazard events aggravate such living conditions<sup>v</sup>.

### **Local people's perceptions and consequences for disaster response policies**

The relation between 'vulnerability' as defined by outsiders, and 'risk perception' by local people is not univocal. Outsiders label the poorest people as the most vulnerable, while in reality people who face greater everyday threats of disease and food shortages, consider disaster risks not as their priority. Since poor people seldom get the chance to participate in vulnerability assessments, outsiders tend to interpret and assume risk behavior of affected populations as universal (read: like their own expected behavior), which leads to the identification of wrong or irrelevant risk reduction measures. Large amounts of money spent on risk reduction by governments and international donors (e.g. dikes and flood control systems) might be a waste of resources, while the risks prioritized by poor people are ignored (e.g. safe drinking water or primary health care).

Prioritized risks by the poor are embedded in the poor living conditions that also prevent them from responding adequately to disasters. In this sense, they would benefit from a framework that links disaster risk reduction with development efforts, because 'reducing the vulnerability of the poor is a development question'. A first implication of this view for existing disaster management policies is that the disaster cycle model needs a critical review. Secondly, to understand people's perceptions of risk, their participation is essential in assessing their vulnerable conditions and for the identification of appropriate assistance. Poor people at risk should become visible and their interests and needs heard. These two implications have then a consequence for the usage and purpose of assessment tools.

### *Local people's perception and the disaster cycle model*

The disaster cycle model is applied and promoted by almost all agencies involved in disaster management. The model encourages us to look at disaster problems by dividing them into smaller entities, like emergency response, rehabilitation, reconstruction, mitigation, preparedness and early warning. The focus is still very much on the hazard event itself, and organizations and funding agencies specialize themselves in one of the entities, independent from each other. Contrary to what most disaster managers do, poor communities do not perceive disaster preparedness, emergency response, rehabilitation, recovery, and mitigation, as separate phases of a cycle, but as integral parts of their survival and development process. Poor communities accumulate knowledge and skills from previous experiences and manage their resources and capacities to deal with the ongoing process of mounting vulnerability. Disasters are part of that process, either as the result of natural hazard events, or as the result of 'development' that went wrong and does not benefit the people at risk.

Communities at risk would benefit from a framework that shifts from managing disasters as a temporary interruption to development, towards linking poverty, disaster risks and vulnerability to development. The aim of disaster response is not to bring things back to normal like before the disaster, but to increase people's capacities and strengthen their coping strategies to deal with adverse events better. However, this alone would not be sufficient. Disaster vulnerability can only be reduced if conscious and organized communities and the public can pressure governments in such a way that their interests are no longer ignored in government's decision-making and planning (Heijmans A, L. Victoria, 2001: 16). To achieve this, meaningful participation of people at risk in all aspects of disaster risk management is essential.

*Box 5: Searching for a more appropriate disaster response model: experience of the Citizens' Disaster Response Network (CDRN) in the Philippines*

In 1984, when the CDRN was established, it promoted the disaster cycle model as being a developmental framework. In the eighties most aid agencies put emphasis on relief and emergency response only, while the disaster cycle model showed a more comprehensive set of responses and included preparedness and mitigation. Later CDRN realized that the disaster cycle model still focuses on the hazard and disaster event, and not on addressing vulnerability. Besides, in a disaster context of recurring hazards like the Philippines, the phases in the cycle overlap: post-disaster response is at the same time pre-disaster assistance, causing rehabilitation, mitigation and preparedness to become integrated with the aim of reducing disaster risks.

CDRN views its disaster response as a *process of community capacity building*. In the future, this process will lead to the reduction of people's immediate and long-term vulnerabilities. It still uses the terms emergency response, preparedness and mitigation, not to distinguish the different phases of disaster response, but more to indicate the kind of capacities and vulnerabilities to focus on. For example, preparedness strengthens people's capacities to improve warning and organized evacuation to reduce the people's vulnerability of living in an unsafe location. Mitigation focuses on reinforcing people's coping strategies and building organizational capacity to address factors that generate people's vulnerability like unequal distribution of resources, over-expensive basic services, policies and legislation that are anti-people's development. In this way, CDRN integrates disaster response into the people's development agenda.

*Participation of people at risk is essential for effective disaster risk reduction*

Local people have knowledge about their locality, the history of disasters in their place, and how vulnerability to disasters has changed over time. They have the right to participate in decisions that affect their lives directly. People's participation is basic, because safety, stability of livelihood, well being and disaster management is their concern, and not solely that of 'experts' such as government, scientists and aid agencies. The knowledge of scientists and experts is still relevant and needed though, especially regarding rare and new types of (human-made) hazards, like arsenic contamination of water in Bangladesh, which is natural in origin, but induced by human factors, or toxic waste spills from mining sites in various Asian countries. Public awareness, using scientific data in a popular manner, is an important risk reduction measure that can positively influence actions of communities at risk. In turn, scientists and disaster managers should recognize the value of people's perceptions; local and outsiders' perceptions should be considered as complementary.

People's participation is not just the process of consultation and providing information to outsiders during assessments, intervention selection and implementation. If we are serious in addressing vulnerabilities then people's participation should be made part of an empowerment process: joint assessment of capacities and vulnerabilities builds

awareness, and leads to the formation of new local institutions or to the strengthening of existing ones. The voice of people at risk should be made heard.

**Box 6: Capability building towards a resilient community**

In November 1995 a super typhoon hit the village of Libis, San Mateo, Rizal, which is situated along a river in the suburbs of Metro Manila. Floods damaged houses and destroyed home-based livelihoods. Some children almost drowned after being trapped by floodwaters. Blamed for the flood was a protective wall along a middle class sub-division that effectively acted as a dam, but caused the water to rush in the direction of the much poorer community in Libis. Another factor that creates increasingly vulnerable conditions for floods is quarrying upstream (for cement and marble).

After the 1995 disaster in Libis, CDRC provided relief assistance to the typhoon and flood survivors, followed by a Disaster Management Orientation and Disaster Preparedness Training. Here the rescue teams were formed and a community counter disaster plan formulated. Through CDRC's intervention, the existing people's organization "Buklod-Tao", formed a Disaster Response Committee, and undertook the following activities on their own:

- Conducted a disaster preparedness training to the whole community
- Submitted a request for the construction of rescue boats to the Dutch Embassy
- Built three rescue boats after approval
- Conducted a rescue drill in the river
- Finalized a counter disaster plan and a community hazard map
- Monitors the water levels in the river when it rains
- Defined a system for Evacuation Center Management (food, health, daycare, etc).
- Organizes a community kitchen for people in the evacuation center during flooding
- Participates in different environmental awareness and advocacy activities at the municipality and national level to address root causes of flooding
- Updates the counter disaster plan regularly
- Networks with Local Government (Barangay Council), Holy Cross Parish, CDRC, and Haribon (environmental NGO)

*Application of assessment tools to serve the process of people's empowerment*

Aid agencies assess disaster situations in order to target the most affected and most vulnerable families, and to identify appropriate assistance. In general, assessment tools and guidelines are developed according to the disaster cycle model: (1) damage-needs assessments to identify emergency relief assistance (2) capacity and vulnerability assessment (i.e. the matrix promoted by Anderson and Woodrow) to select post-disaster responses, and (3) hazard, vulnerability and capacity assessment to identify preparedness and mitigation efforts. In most cases, these tools are not linked, even if an organization is involved in all phases of the disaster cycle. Given the critique of the disaster cycle model, and considering the importance of people's participation in the assessment, assessment tools require the following features:

- recognize people's perception of risks that goes beyond the emergency and disaster paradigm, including a hazard assessment from people's perspective
- recognize people's capacities and coping mechanisms from a historical perspective
- identify and analyze the dynamic pressures that deprive the people of their resources to cope with adverse events
- increase awareness of people about root causes of vulnerability and future risks
- can be transferred and applied by the community so they can further improve their expertise in identifying and articulating what they need to reduce their vulnerability

The Center for Disaster Preparedness and the Citizens' Disaster Response Network in the Philippines are currently piloting a participatory risk assessment method that has all the above features, and aims to identify community-specific strategies for immediate and long-term (disaster) risk reduction. It builds on CDRN's existing Hazard, Capacity and Vulnerability Assessment (HCVA) method, with two remarkable differences: (1) it tries to better balance people's risk perceptions with outsiders' knowledge, and (2) it uses the 'disaster crunch and release model' to develop people's analytical capacities and to raise the awareness of community members about the root causes of their vulnerability. Box 7 explains briefly the steps of a participatory risk assessment at community level.

**Box 7: Process of Participatory Risk Assessment as piloted by CDP and CDRN in the Philippines**

A participatory risk assessment has basically five steps:

1. *Hazard Assessment:* Community group discussion starts with a concrete event (hazard) experienced by the community. People can vividly memorize what happened when the hazard hit them. The purpose of a hazard assessment is to specify the nature and behavior of past hazards and potential threats to the community. Hazards - natural and human-made - are described and analyzed by people recalling warning signs, forewarning period, speed of onset, frequency, when, duration of impact, and how people perceive these hazard risks – 'part of normal life', 'rare', 'dangerous' or 'new'. Tools often used for the assessment are hazard mapping to locate the scale/ extent of a hazard's impact and elements at risk. A historical profile makes understandable how nature and behavior of hazards changed over time, or when the hazard started to happen. A seasonal calendar visualizes the period, frequency and duration of common hazards.
2. *Description of disaster situation or crisis:* The next step in the risk assessment is that community members are asked to describe the effects of the hazard. They are asked to describe the disaster event: damage to houses, crops, animals, lifelines, effects on people, livelihoods, social relations, organizations, how they coped, etc. This is the same kind of information that aid agencies gather direct after a disaster event, called a 'Damage, Needs and Capacity Assessment'<sup>vi</sup>. If hazards happen less frequently or are new to the community, the questions need to be approached differently: people have to list the elements at risk and to tell how these are likely to be affected.
3. *Analysis of people's capacities and coping strategies:* The purpose is to understand people's previous experiences of crisis and disasters that have enabled them to develop particular strategies, and if these strategies were successful or failed, and the underlying reasons. People are asked how they protect elements at risk, identified in step 2. What do they do individually and what as a community? Various authors have attempted to classify coping strategies according to the immediate aim of the strategy, and the nature of resources involved (Walker, 1989; Blaikie, et al: 1994; Maxwell, 1996; Mula, 1999). Maxwell argues that the choice of certain coping strategies over others may provide insights into perceived security and risk, and may enhance understanding of levels of vulnerability (Maxwell, 1996; 301). Understanding what people do in times of crisis and their selection of coping strategies leads often to eye-openers for outsiders, who need then to adjust their perceptions of people's risk behavior.
4. Explanation of why hazards become disasters, i.e. linking the disaster effects (step 2) to processes that generate vulnerability and deprive people of their resources for coping with extreme events. A useful model for this purpose is the 'disaster crunch model' developed by Blaikie, et al (1994). The model distinguishes three levels or links (root causes, dynamic pressures, and unsafe conditions) which connect the occurrence of a disaster to reasons that are sometimes quite remote from the community and lie in the sphere of policies and laws made by the government. To make the crunch model a practical analytical tool for at-risk communities, the sequence of the different levels is reverted. The first column with the root causes moves to the end, while we start the model with the hazard assessment described in step 1. Figure 1 shows the various columns of the modified 'disaster crunch model' to analyze the armed conflict in Mindanao, Philippines. By applying the 'crunch model', local people 'discover' the root causes of their vulnerable conditions, and realize that disasters are not natural. It works as an awareness raising activity, and foster the need for organized action to improve the conditions at community level and ultimately to change structures and policies that cause people's vulnerability to disasters<sup>vii</sup>.

5. Community people prioritize the elements at risk that need to be protected or strengthened. By converting the 'crunch model' into positive statements the 'release model' is created, providing the direction in which people's capacities (from step 3) should be strengthened to address root causes of vulnerability (from step 4). This puts capacities of poor people in a wider context, and risk reduction measures beyond the emergency and disaster paradigm.

The Participatory Risk Assessment is part of a capability building process to transform communities at risk into resilient communities. To obtain reliable assessment results, there should be a certain level of contact and trust between the community and outsiders. The most common way aid agencies meet with communities at risk, is during and directly after a hazard event when they provide relief assistance. Relief boosts people's moral and motivational senses, rather than fulfilling their urgent basic needs. However, relief aid could be an entry point to establish contact and to build initial rapport with community leaders. From here a process of community capacity building can start to address their vulnerabilities. In the long run the need for relief interventions in a particular high-risk community is reduced.

Figure 1: Modified Disaster Crunch Model to analyze processes in Mindanao, Philippines, that led to armed conflict between Moro Islamic Liberation Front and the Armed Forces of the Philippines, from community members perspective in May 2000.

Hazard: Crisis indicators	Elements at Risk (Disaster Situation)	Unsafe conditions	Dynamic Pressures	Root Cases
<ul style="list-style-type: none"> <li>• Rumors</li> <li>• Harassment</li> <li>• Isolated killing</li> <li>• People disappear</li> <li>• Fire</li> <li>• Rape</li> <li>• Bombing</li> <li>• Shelling</li> <li>• Forced resettlement in protective camps</li> <li>• Curfew</li> <li>• Food blockade</li> </ul>	<ul style="list-style-type: none"> <li>• People – killed, wounded, injured, exhausted, hungry</li> <li>• People are afraid, traumatized, suffer mental illness</li> <li>• Women give premature birth, have miscarriages</li> <li>• Family separation</li> <li>• Divided communities: Moro – Christian</li> <li>• Houses, schools and other assets lost</li> <li>• Animals lost / injured</li> <li>• Low mobility affecting livelihood / harvest</li> <li>• Economic disruption</li> <li>• Education of children disrupted</li> <li>• Destruction of infrastructure</li> <li>• Environmental destruction</li> <li>• Spread of diseases</li> <li>• People are displaced</li> <li>• Cramped / poor facilities in evacuation center</li> <li>• Feeling intimidated by aid workers</li> <li>• Tired of answering questions posed by aid workers / outsiders</li> </ul>	<ul style="list-style-type: none"> <li>• Community situated in or near MILF camp / military detachment</li> <li>• Community located in target area of TNCs, mining companies, etc.</li> <li>• People not able to bring clothes, assets, etc. to evacuation center (EC), because no warning</li> <li>• Too dangerous to continue harvest, therefore acute hunger</li> <li>• Illiteracy (on Human Rights issues, Mining Act, etc.)</li> <li>• No secure evacuation site</li> <li>• No water available in EC</li> <li>• Low employability</li> <li>• Poor health condition / malnutrition</li> <li>• Food shortage</li> <li>• Discrimination by other groups</li> <li>• Accused of being sympathizer with rebels</li> <li>• Dangerous to return to previous home because of vigilantes</li> <li>• Traditional leadership structures not recognized by aid workers</li> <li>• No say in local politics</li> <li>• Feeling inferior, marginalized</li> </ul>	<ul style="list-style-type: none"> <li>• Internal refugees belong to marginalized groups, because of origin or religion</li> <li>• Low income levels and unstable livelihoods</li> <li>• No secured land rights</li> <li>• No access to basic services</li> <li>• GO does not prioritize humanitarian assistance</li> <li>• GO and TNCs force access to exploit natural resources (gas, wood, gold, land, etc)</li> <li>• Incorrect projection of conflict by media</li> <li>• Internal refugees used by politicians for personal (election) gains</li> <li>• Cease fire violations</li> </ul>	<ul style="list-style-type: none"> <li>• Since colonial times domination of 'outsiders' over original population</li> <li>• Land grabbing laws made in Manila</li> <li>• Philippine Government favors TNCs' interests over Moro issues</li> <li>• Philippine Government uses militarization to ensure access to natural resources</li> <li>• Philippine Government uses Abu Sayyaf and biased media to declare total war in Mindanao</li> <li>• Laws, GATT, etc. further marginalize original population</li> <li>• Difference in political and economic Ideology</li> </ul>

Usually, a participatory risk assessment is part of a Disaster Preparedness Training for community members. The output of the training is an initial community-specific Counter Disaster Plan and the formation of a Grassroots Disaster Response Organization (GDRO) or structure appropriate to the community. To make a GDRO functional, follow-up support is often necessary. The particular risk reduction measures that need to be undertaken from here, largely depend on the kind of hazards, existing capacities and the level of vulnerabilities. These can be responses with immediate benefits like a warning system, an evacuation plan and diversification of crops, or long term risk reduction measures like tree planting, community alliance building and advocacy for resettlement and land rights. This process can take several years and some of the root causes might not be eliminated in a lifetime. It may require the effort of generations.

### **Conclusion**

Vulnerability to disasters is a matter of perception, and in most aid agencies' perceptions, the view of local people is lacking. Most agencies tend to think on behalf of the victims, not realizing that disaster-prone communities might interpret their circumstances differently. Assessing vulnerability is just one side of how people take risk-related decisions. If we want our disaster responses to be meaningful, we need to give affected communities a voice and recognize their risk perception as well as their active role in exploring strategies that ensure livelihood security on the long-term. The latter means that we should strengthen these strategies to address the root causes of their vulnerability, and to broaden our perspective beyond the disaster response framework. Part of this, is supporting alliance building among communities at risk, as well as with organizations and groups in society that advocate justice, peace and responsible governance. After all, addressing vulnerability is a political issue.

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<sup>i</sup> As of December 1997, the Philippine government has approved that 56,168.53 hectares of prime agricultural lands can be converted. In 1998 alone, 554,350 farmer households lost their primary source of livelihood (IBON, 1998).

<sup>ii</sup> According to the International Rivers Network (IRN), roughly two million people are displaced yearly by large dams. In almost all case studies, the majority of people evicted are usually poor farmers and indigenous people (IBON, 2000).

<sup>iii</sup> The term 'development aggression' has been in use among communities and the NGO-movement since 1995, when the Philippines started to implement 'development' programs on a large scale. The Mining Act was approved, the country prepared itself for the APEC meeting to be held in 1996, and it targeted to enable the country to reach the status of a newly-industrialized country (NIC) by the year 2000.

<sup>iv</sup> The 'disaster pressure' model is a very effective instrument to encourage local people to analyze their conditions, to discover root causes of why they endure hardship and to mobilize them for action. It raises people's awareness about the political origins of the disaster and their vulnerability.

<sup>v</sup> It is necessary to distinguish between hazard-types, since each hazard has a particular impact on people's resource base. River erosion, lahar flows and landslides affect people's entitlement to land. Typhoons and floods destroy mainly seasonal crops.

<sup>vi</sup> The 'D' in the DNCA is not just material damage, but includes social and motivational 'damage' as well. Internal refugees, for example, displaced by armed conflict, might have lost their homes, crops, livelihood and access to their land, but more often they also experienced human rights violations and lost their relatives, resulting in trauma. Likewise, not only physical needs, like food and clothing, are identified, but also support like psycho-social assistance, advocacy, fact-finding missions, public information campaigns, education on human rights, etc.

<sup>vii</sup> Vulnerability assessments conducted in different communities and countries, and involving different hazard types, reveal how universal root causes at the global and national levels are channeled through dynamic pressures into particular location specific unsafe conditions (ADPC, 2000).