not disabled. Equal treatment is necessary but not sufficient; an added allowance (or, as the UN terms it, a 'reasonable accommodation' to cover what Sen calls the 'conversion gap') is necessary to make rights 'real' for people with disabilities. The United Nations has passed 22 Standard Rules on Equalisation of Opportunities for Persons with Disabilities. These fall into three categories. The first is 'preconditions for equal participation' such as awareness-raising, medical care, rehabilitation and support services. The second is 'target areas for equal participation' such as accessibility, education, employment, income maintenance and social security, family life and personal integrity, culture, religion and recreation/sports. The third consists of 'implementation measures' such as information and research, policy making and planning (Yeo and Moore, 2003). Where disabled people have been consulted, they put highest priority on equal treatment, restorative equipment, sexual fulfilment, access to rights and entitlements, mobility, credit, employment and livelihoods (Erb and Harriss-White, 2002). If development is self-realisation through social agency as well as improvements in material conditions then the quality of the lives of people with disabilities must be one of its most sensitive indicators.

BARBARA HARRISS-WHITE
DEVI SRIDHAR

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Disaster Mitigation

What is disaster mitigation?

Disaster mitigation as a development concept largely has its origins in the context of disasters and disaster risk management. It specifically describes measures, strategies and activities that minimise the adverse impact of natural, technological or other threats through what are known as 'structural' and 'non-structural' mitigation measures. Disaster mitigation efforts primarily focus on managing the 'risk factors' that drive the potential for disaster loss by targeting the hazard or threat itself (for instance an upstream dam designed to avert downstream flooding). This is often referred to as 'structural mitigation',

as it requires infrastructure or engineering measures to 'keep the hazard (that is, the flood) away from those at risk'.

However, disaster mitigation efforts also target those that are at risk, by reducing their vulnerability to a specific threat (for instance, through the enforcement of land-use regulations and public education in a flood plain). This is often called 'non-structural mitigation', as it promotes risk-reduction behaviours and attitudes to 'keep people away from hazards and threats' (in this instance, a potential flood). Non-structural mitigation efforts also include education, empowerment and social mobilisation initiatives that reduce the vulnerability of specific at-risk groups, such as women- and child-headed households in areas that are exposed to natural and other threats.

Why is disaster mitigation relevant to development?

Although mitigation as an organising concept has been extensively applied in disaster-related fields, it has been less explicitly applied in developmental contexts. This is in part due to past and continuing disjunction between developmental action and what is popularly viewed as disaster management – a perception which defines actions that are disaster related as somehow separate from development concerns. Yet, there is increasing evidence that sustainable development and poverty reduction objectives are not achievable if disaster risk is not more effectively managed, and losses avoided or minimised wherever possible. This applies at all scales, from regional and national levels to the experience of individual households and families.

Repeated disaster losses undermine development

For instance, extreme weather events such as cyclones, hurricanes and powerful winter storm systems can trigger widespread flooding and disruption to services, as well as damage and destruction to physical infrastructure that result in sizeable losses and development setbacks even in developed nations. Similarly, poor families affected by repeated drought shocks in areas isolated from essential public services are also witness to the erosion of their already precarious asset base, levels of health and potential for sustaining their livelihoods. In urban areas, poor residents of densely congested informal settlements may find their homes destroyed by recurrent fires, landslides or floods that might never be declared 'national disasters'.

It is clear that this repeated destruction of household assets as well as erosion of household livelihoods sets back development potentials at household, community, national and even regional levels where powerful transboundary threats – including extreme weather systems – have the potential to trigger severe losses across many countries.

What is also clear is that poor households, communities and countries bear disproportionately high losses compared with their wealthier neighbours. Evidence suggests, for instance, that poor countries repeatedly shocked by tropical storm systems, other extreme weather events, earthquakes, droughts and epidemics, sustain significantly larger losses proportionate to GNP than wealthier nations, who have the capacity to absorb the impact and recover more quickly.

These examples illustrate reasons why ongoing strategies to 'mitigate' the effect of expected shocks and stresses such as extreme weather events should be viewed as integral elements of development planning. This is because they help avoid the unnecessary losses

and hardships that compromise and undermine potentials for development – particularly in poor households, communities and countries.

However, it is not only people who sustain losses when exposed to external shocks and stresses. Our natural environment, especially with respect to its more fragile ecological zones, is particularly vulnerable to external forces. Intense and rapidly spreading wildfires can destroy natural vegetation, which in mountain areas have the potential to destabilise steep slopes. Intense and protracted drought processes can accelerate rates of soil erosion.

In these instances, robust development planning and action in fire or drought exposed areas should ideally incorporate appropriate *disaster mitigation* strategies to minimise the chance of such destructive losses. In the former example, this might include restoring the natural fire regime in a wooded area. This would allow ecologically robust natural burn processes to occur within controlled parameters and avoid the accumulation of an ageing and highly dangerous fuel load. In the second, the use of careful ploughing techniques that minimally damage the topsoil of drought-prone agricultural land can assist in mitigating the impact of rainfall scarcity. In this context, many effective mitigation measures are drawn from generations of indigenous knowledge, which reflect a deep understanding of naturally occurring hazard processes. Examples of this include the use of contour ridges or terraced agricultural practices in Asia to reduce the risk of land instabilities on steep hillsides. They also include the long-established practice of flood-plain recession cultivation in riverine areas of Asia, Africa and the Middle East that face recurrent drought risks. In this instance, residents protect their livelihood security in the dry season by cultivating the nutrient-rich flood-plain as the floods recede.

'Development' has potential to increase disaster losses

In the same way we recognise that repeated losses from disasters undermine development opportunities, it is now understood that poor development practices also increase the probability of disaster loss and hardship. As 'development' forces expansion into areas that are more ecologically vulnerable, our exposure to potential losses increases. This includes urban, recreational and commercial development in coastal zones as well as estuarine areas that increase the likelihood of losses triggered by storm surges and coastal flooding. It also includes development of wooded mountain regions and risks associated with land instabilities, fires, flash floods and avalanches. Moreover, the expansion of agricultural activities into areas that are already under pressure increases the likelihood of losses from drought. Today, we are especially conscious of the links between disasters and the rapid growth of cities, particularly those in developing countries, characterised by the rapid in-migration of poor households seeking to escape rural poverty or – in many instances – armed conflict. In addition to pressing needs for social and other essential services, affordable housing is an urgent priority. However, this rapid largely unplanned urban growth is reflected in non-engineered formal and non-formal housing, seldom built in compliance with building codes and regulations. These homes, and the families who live within them, are highly vulnerable to natural and other threats, which may include landslides, earthquakes, extreme weather, communicable disease outbreaks and informal settlement fires. Such 'development' within cities places the lives and livelihoods of tens of thousands of people at risk annually.

Sound and sustainable development minimises disaster loss

Disaster mitigation has a direct role to play in minimising the processes of risk accumulation that drive the possibility of disaster events. For instance, the protection of wetlands has long been valued for ensuring the continuity of rich and diverse ecosystems. It is increasingly recognised that wetlands also offer 'free environmental services' that include the properties of flood attenuation and flood mitigation. It makes environmental sense to nurture not only these protective services, but also good mitigation practice, to minimise the potential for destructive floods.

Similarly, effective poverty reduction and social assistance programmes that support the most economically at-risk members of a community are important disaster mitigation mechanisms. In wealthier countries where grants and pensions are accessible as government-supported social safety nets, those most at risk are economically cushioned from external shocks. In other contexts, community-based saving schemes, money clubs and farming cooperatives also provide a buffer against modest shocks for their individual members – even if these are not sufficiently robust to withstand extreme loss.

In countries where HIV/AIDS and other communicable diseases compromise individual and household capabilities to manage everyday stresses, let alone more extreme shocks such as drought and flood events, accessible equipped and affordable health services are crucial disaster mitigation mechanisms. In fact, health and education services have been identified as central to the developmental reduction of disaster-related losses. It is recognised that measures should be taken to reduce the risk of disaster-related losses to such services and facilities wherever possible. This, in the case of health services, ensures service continuity in times of stress when life-saving medical services are most needed, and similarly for schools, avoids costly disruptions to learning. Schools and other buildings are also often depended on as community evacuation centres when an area is affected by an endangering weather system, flood, fire or earthquake – and, unknowingly may place large numbers of children at risk if they are not appropriately risk proofed for expected threats.

As our knowledge of effective risk-reduction measures increases, it is possible to apply and adapt mitigation solutions in different contexts. For instance, Latin America and the Caribbean's extensive experience in hurricane- and earthquake-proofing schools and health facilities is equally relevant to other developing contexts that face similar threats.

Disaster mitigation and risk reduction

In the past, disaster mitigation was largely viewed as an element of disaster management. Today it is regarded as a critical component of developmental risk reduction, in which vulnerabilities and disaster risks are reduced and sustainable development opportunities strengthened. This approach shifts from a focus on 'managing disaster events' to the developmental and ongoing 'reduction of disaster risks'. In this context, disaster risk is viewed as the likelihood of loss due to the interplay between an *external* threat (such as a drought or extreme weather event) and *internal* conditions of vulnerability.

An example of this would be the impact of a significant – but not necessarily severe – wind and rainstorm. Residents of well-built houses with solid foundations, walls and roofs would withstand this without difficulty. This might be in contrast to the experience of informal settlement residents whose homes are made of wood and corrugated iron

sheeting and who live in areas without municipal storm water drainage, and who might be flooded out, lose their possessions, be temporarily displaced or become ill.

In this example, it is not the external threat (the storm) that was responsible for the disproportionate impact on the informal settlement residents. It was their underlying conditions of economic, social and environmental vulnerability that contributed to the storm's adverse impact and hardship. In many developing countries, the risk profile of informal settlements is significantly driven by this interplay of economic, social and political marginalisation processes. Located far from a city's main business and commercial nodes, and with limited access to dependable transport, informal settlement residents are economically and spatially marginalised. Moreover, as many have their origins in outlying areas characterised by minority political, ethnic or religious affiliations, their political leverage is limited in achieving appropriate support developmental intervention from the local authorities.

In this instance, among the disaster mitigation strategies that may be considered are those that focus on structural measures, including effective low-cost techniques to better weather-proof flimsy non-engineered structures. They might also involve the rehabilitation of neighbouring wetlands if applicable and strengthened systems for disseminating weather-warning information to the residents of settlements at risk. Appropriate non-structural mitigation measures may also include the establishment of representative consultative processes between the local authorities and settlement residents to collaboratively upgrade the areas most at risk.

Effective disaster mitigation today calls for greater attention to these developmental drivers of disaster risk, and gives greater emphasis to measures that reduce the vulnerability or, its reciprocal, to, enhance the resilience of those most at risk. In flood-, fire-, storm- and drought-prone areas, effective mitigation practice requires the same transparent and participatory decision-making processes that are applied to other forms of development.

In the same way, our investments in development are less likely to be undermined if they incorporate disaster mitigation measures for known and expected risks – irrespective of whether they are capital-intensive housing projects or community-based rainwater harvesting initiatives. However, the relative effectiveness of selected mitigation interventions is itself determined by the degree to which chosen measures are sustainable and/or can adapt to a rapidly changing physical and social environment. For instance, structural coastal defences to prevent erosion and storm surges can eventually be pounded away by the ceaseless motion of waves. Moreover, rapid unplanned urban growth can overwhelm municipal capabilities to provide essential protective services and also lead to unplanned occupation of high-risk areas.

We live in a world characterised by increasing climate variability and population densification in hazard-exposed areas – both accompanied by the likelihood of increased disaster loss. If indeed we are to achieve our aspirations for sustainability in this increasingly risk-prone environment, then disaster mitigation is a non-negotiable component of development planning and implementation.

AILSA HOLLOWAY

Further reading

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