Vulnerability and Capacity Analysis

Guidance Note 9

Tools for Mainstreaming Disaster Risk Reduction *is a series of 14 guidance notes for use by development organisations in adapting programming and project appraisal and evaluation tools to mainstream disaster risk reduction into their development work in hazard-prone countries. The series is also of relevance to stakeholders involved in climate change adaptation.*

This guidance note introduces basic approaches to vulnerability and capacity assessment and analysis[1] (VCA), explains how it can be integrated into the project planning process and shows how natural hazards and disasters can be factored into it. It focuses on the use of VCA in development projects, but the approach can also be used in disaster reduction and post-disaster recovery. It is aimed at staff from diverse disciplines.

1. Introduction

VCA is a key component of disaster risk analysis. Its purpose is to:
- identify vulnerable groups;
- identify the factors that make them vulnerable and how they are affected;
- assess their needs and capacities (and empower them to assess these); and
- ensure that projects, programmes and policies address these needs, through targeted interventions or prevention and mitigation of potentially adverse impacts.

Economically and socially marginalised groups in society generally suffer worst from natural disasters (**see Guidance Note 3**). This question of people's vulnerability and capacity in the context of natural hazards is very important for understanding the potential impact of disasters and making choices about how to intervene. More generally, socio-economic vulnerability is also now seen as a key to understanding poverty and designing poverty reduction programmes.

VCA considers a wide range of environmental, economic, social, cultural, institutional and political pressures that create vulnerability. Table 1, produced at a recent workshop on VCA and disaster risk reduction, illustrates the range of factors that may be relevant. However, this is just one way of viewing and categorising the subject, which can be conceived and framed in a variety of ways (for another example, see Box 1). Developing an appropriate framework for analysis is essential when starting a VCA (see Section 3).

Table 1 Hazard-related vulnerabilities and capacities of different sectors

Sector	*Vulnerabilities*	*Capacities*
Social	■ Occupation of unsafe areas ■ High-density occupation of sites and buildings ■ Lack of mobility ■ Low perceptions of risk ■ Vulnerable occupations ■ Vulnerable groups and individuals ■ Corruption	■ Social capital ■ Coping mechanisms ■ Adaptive strategies ■ Memory of past disasters ■ Good governance ■ Ethical standards ■ Local leadership

1 In this note, 'assessment' is taken to mean the process of collecting information, 'analysis' its interpretation.

Sector	Vulnerabilities	Capacities
	■ Lack of education ■ Poverty ■ Lack of vulnerability and capacity analysis ■ Poor management and leadership ■ Lack of disaster planning and preparedness	■ Local non-governmental organisations ■ Accountability ■ Well-developed disaster plans and preparedness
Physical	■ Buildings at risk ■ Unsafe infrastructure ■ Unsafe critical facilities ■ Rapid urbanisation	■ Physical capital ■ Resilient buildings and infrastructure that cope with and resist extreme hazard forces
Economic	■ Mono-crop agriculture ■ Non-diversified economy ■ Subsistence economies ■ Indebtedness ■ Relief/welfare dependency	■ Economic capital ■ Secure livelihoods ■ Financial reserves ■ Diversified agriculture and economy
Environmental	■ Deforestation ■ Pollution of ground, water and air ■ Destruction of natural storm barriers (e.g., mangroves) ■ Global climate change	■ Natural environmental capital ■ Creation of natural barriers to storm action (e.g., coral reefs) ■ Natural environmental recovery processes (e.g., forests recovering from fires) ■ Biodiversity ■ Responsible natural resource management

Source: Davis, Haghebaert and Peppiatt (2004).

Some factors in vulnerability are readily apparent (e.g., threats arising from environmental degradation or human settlement in hazardous locations such as flood plains and unstable hillsides). Less immediately visible are underlying factors such as poverty, population movement and displacement, legal–political issues (e.g., lack of land rights), discrimination, macroeconomic and other national and international policies, and the failure of governments and civil society organisations to protect citizens. The chain of causality, from root causes to local dangers, can be long and complex. Table 2 gives an illustration of this.

Table 2 Chain of pressures resulting in vulnerability to disasters

This table summarises the findings of monitoring surveys carried out by the Citizens' Disaster Response Center in Mindanao and Visayas in the Philippines during a drought in 1997–1998. The causes of vulnerability are separated into categories from the most immediate to the underlying factors; this categorisation is a standard one, taken from Wisner et al. (2004).

Hazard type: drought	Elements at risk (disaster)	Unsafe conditions	Dynamic pressures	Root causes
■ El Niño ■ Deforestation ■ Triggers secondary disasters: epidemics, pests, fire	■ Crops die before being harvested ■ Loss of livelihood ■ Loss of assets (sold to buy food) ■ Children die of malaria and measles	■ Farming does not produce sufficient food to feed family ■ Unstable livelihoods ■ One harvest of corn per year through 'slash and burn' ■ No savings ■ No irrigation facilities	■ 'Slash and burn' system under pressure ■ Logging and mining activities in watershed ■ No secured land rights for indigenous people	■ Laws not in favour of indigenous people ■ Unequal distribution of services and resources with a strong bias against indigenous people

Hazard type: drought	*Elements at risk (disaster)*	*Unsafe conditions*	*Dynamic pressures*	*Root causes*
	■ People die after eating poisonous wild crops ■ Forestland lost due to fire ■ Planting season	■ Steep terrain prone to erosion and landslides ■ Lack of farm tools and animals to cultivate land ■ Many children malnourished ■ Lack of basic services ■ Indigenous people live in remote areas ■ Weak relationships with government structures ■ Low awareness of how to reduce risk of secondary hazards ■ Indigenous practices for coping with disasters lost by younger generation	■ Decline in soil fertility ■ Out-migration of male labour force (seasonal), leaving women, children and elderly in difficult conditions ■ Essential assets are sold, undermining future survival ■ Dependent on money lenders (very high interest rates)	■ National interests are more important than local rights of people ■ Debt crisis, structural adjustment programme, WTO (formerly GATT) force government to promote programmes that do not benefit marginalised groups like indigenous people

Source: Information provided by A. Heijmans, Disaster Studies Wageningen.

VCA also considers the capacities, resources and assets people use to resist, cope with and recover from disasters and other external shocks that they experience. Capacity is a key element in understanding and reducing vulnerability and VCA methodologies should be designed to take it into account.

2. When to use vulnerability and capacity analysis

VCA is used principally as:
- A diagnostic tool to understand problems and their underlying causes.
- A planning tool to prioritise and sequence actions and inputs.
- A risk assessment tool to help assess specific risks.
- A tool for empowering and mobilising vulnerable communities.

In development projects its main purpose is to provide analytical data to support project design and planning decisions, particularly in ensuring that risks to vulnerable people are reduced as a result of the project. It can be applied in a number of different contexts (e.g., poverty reduction, sectoral development, disaster management, climate change adaptation), and at different levels (from national or programme level to community and household). It can perform a range of functions: scoping or screening, programme or project design, research, baseline studies, and monitoring and evaluation. However, despite growing recognition of its value, it is still not systematically factored into development project planning processes, nor even sometimes into risk assessments.

Organisations working in disaster reduction mainly use VCA to identify problems (disaster reduction remains the most common application). In development activity, governments, multilateral organisations, international financial institutions (IFIs) and non-governmental organisations (NGOs) have used it mainly in the project appraisal or preparation phase (**see Guidance Note 5**). Here, VCA commonly forms part of risk analysis[2] or social appraisal, focusing on a particular geographical area or sector. Broad-brush scoping or national-level VCAs (see Section 3) may form part of pre-feasibility studies during the project identification phase.

Other development project planning tools, such as social analysis and social impact assessment, and especially sustainable livelihoods approaches, may address similar issues. They may also use similar data collection and assessment methods; their results can feed into a VCA and, in turn, they can be informed by VCA findings (**see Guidance Notes 10 and 11**).

2 Linked to hazard assessment, which should identify the main hazards to be factored into the VCA (**see Guidance Note 2**).

Many VCA methods have been developed. Academics and practitioners from different disciplines use a variety of concepts and definitions of vulnerability, which leads to different methods of assessment and a focus on different aspects of vulnerability and risk.

3. Basic steps

This section gives general guidance on the basic steps in VCA, illustrating in particular the incorporation of natural hazards and associated disaster risk into the project assessment process.

Vulnerability is specific to time, place and particular hazard threats and groups of people. Each VCA should therefore be planned as a distinct exercise, according to its purpose in the project management cycle and the nature of the project concerned. This will also affect the skills mix required in the project team, and it is important to get the right team in place at the start of the process.

Figure 1 Basic steps in VCA

Step 1. Select a framework for analysis

The starting point is to establish a clear and shared understanding of what is to be analysed (this is linked to the purpose of the project and the role of the VCA in the project cycle). This requires some form of conceptual or analytical framework. Design or selection of a framework is the key to the assessment process.

Whatever form it takes, the analytical framework should:

- be holistic, ensuring that all relevant aspects are considered; sometimes a more narrowly focused VCA may be appropriate, but the initial perspective should be broad to ensure that important issues are not overlooked. Where hazards and disasters are part of the picture, they should be put in context (**see Guidance Note 2**);
- enable identification of the range of elements at risk (lives, health, incomes, livelihood, social ties, property, etc.) and assessment of their exposure to all kinds of external shocks or pressures, including hazards and disasters;
- identify the most vulnerable, recognising that different groups of people are vulnerable to these external shocks in different ways and to different extents;
- look not only at hazardous conditions and the immediate symptoms of vulnerability (i.e., situation analysis) but also at the underlying factors contributing to their vulnerability; and
- examine coping capacities and resilience to shocks and hazards: assessments often fail to pay enough attention to the 'capacities' dimension of VCA.

Analytical frameworks do not have to be complicated. Elaborate conceptualisation may not be appropriate to the practicalities of project planning and management. What is important is that the chosen framework is readily understood, user-friendly and adaptable. The capacities and vulnerabilities analysis (CVA) model (see Box 1) is an example: this framework and variants of it have been in widespread use for some years. Asset frameworks, such as that used in sustainable livelihoods analysis (**see Guidance Note 10**), are also commonly used. There are now many models to choose from or adapt (see Further reading), although they are often similar conceptually. If necessary, frameworks can be refined or made more detailed as planning progresses.

Box 1 **Capacities and vulnerabilities analysis**

Originally developed in the 1980s to make relief interventions more developmental, this model has been used widely in other disaster and development contexts, and many other VCA methods have built on it. The basis of the CVA framework is a simple matrix (see diagram) for viewing people's vulnerabilities and capacities in three broad, interrelated areas:

	Vulnerabilities	*Capacities*
Physical/material What productive resources, skills and hazards exist? (Includes land, climate, environment, health, skills and labour, infrastructure, housing, finance and technologies)		
Social/organisational What are the relations and organisation among people? (Includes formal political structures and informal social systems)		
Motivational/attitudinal How does the community view its ability to create change? (Includes ideologies, beliefs, motivations, experiences of collaboration)		

Five other factors can be added to the basic matrix to make it reflect complex reality. These are disaggregation by gender; disaggregation by other differences (e.g., economic status); changes over time; interaction between the categories; and different scales or levels of application (e.g., village or national levels).

Source: Anderson and Woodrow (1998).

Step 2. Select the unit or level of analysis

This should be clearly identified at an early stage, to facilitate planning the VCA's scope and focus, identifying stakeholder participants and selecting data collection and analysis methods.

VCAs can be carried out on almost any scale, from household and community to national and even international level. Complementary VCAs at different levels could also be considered.[3] They can focus on many different sectors or dimensions of development (e.g., food security, education, gender, transport, trade, disaster reduction).

Box 2 Country-level VCA

A World Bank national-level analysis of vulnerability in Guatemala in 2000–2001 used quantitative data from a recent extensive and cross-sectional Living Standards Measurement Survey, carried out an in-depth qualitative survey on poverty and exclusion in a sample of ten villages and complemented this with other administrative and statistical information including maps and reviews of social protection programmes. The data were then subjected to several formal analytical and statistical techniques.

The analysis covered the different kinds of shock (e.g., economic, social, natural) that were sources of vulnerability at macro- and micro-levels; their frequency and differential impact on household income, consumption, wealth and inequality; coping strategies and their effectiveness; and the value of external assistance.

The findings led to better understanding of the links between vulnerability and poverty, thereby strengthening the analytical and operational content of the government's poverty reduction strategy, as well as the Bank's programmes for poverty assessment and social protection in Guatemala.

Source: Tesliuc, E.D. and Lindert, K. *Risk and Vulnerability in Guatemala: A Quantitative and Qualitative Assessment*. Social Protection Discussion Paper No. 0404. Washington, DC: World Bank, 2004. Available at: http://siteresources.worldbank.org/SOCIALPROTECTION/Resources/0404.pdf

Step 3. Identify stakeholders

For success, VCA depends to a large extent on the involvement of relevant stakeholders in providing and analysing data, whether at national or community level. As well as supplying more valid data through incorporation of a range of expert knowledge and perspectives, this ensures wider ownership of the findings, which can be further enhanced if participatory methods are used. Note that it may not be possible to identify all the stakeholders initially; others may be identified as the VCA process develops and should be incorporated into it.

It is particularly important to include vulnerable people in the process and, in hazard-prone areas, all those who are at risk from those hazards. It is also important to remember that the nature and impact of vulnerability varies across different groups.

Collaborative involvement of vulnerable people and external stakeholders (e.g., government officials) in the VCA process should be encouraged as this can stimulate a shared understanding of the issues and the appropriate solutions, as well as having the potential to influence policy and practice elsewhere.

Box 3 Collecting stakeholder perspectives

In 2000, the Palestine Red Crescent Society (PRCS) carried out a VCA as a first step towards a national disaster preparedness plan. The six-month assessment was explicitly participatory. It drew on interviews with officials and NGOs and 22 focus groups in towns, villages and refugee camps across the West Bank and Gaza, seeking to get a cross-section of Palestinian society. One novel element was the inclusion of children and young people, who expressed their vision of disasters and disaster mitigation through drawings.

3 At national level, VCA will probably be used principally as a diagnostic and risk assessment tool, but at local level its role as a participatory planning instrument may be equally important.

The work was carried out by PRCS staff, who received training in interview and group animation techniques. Two pilot studies were held to test the focus group method. Care was taken to ensure good gender balance in the focus groups and the involvement of other vulnerable groups such as the elderly. Two information-gathering workshops were held involving PRCS employees and a great deal of documentary data was collected.

Key institutional stakeholders were brought into the project's steering committee to ensure that the process would be taken forward. They included Palestinian Authority ministries and local NGOs.

Sources: PRCS. *Vulnerability and Capacity Assessment: A Participatory Action Research Study of the Vulnerabilities and Capacities of the Palestinian Society in Disaster Preparedness.* El Bireh: Palestine Red Crescent Society, 2000; IFRC. *World Disasters Report: Focus on reducing risk*. Geneva: International Federation of Red Cross and Red Crescent Societies, 2002.

Step 4. Select approach for data collection and analysis

The approach and methods must be appropriate to the scale and scope of analysis, as well as the VCA's purpose. There must be clarity and agreement about these aspects before data collection and analysis begin.

The method must be participatory and comprehensive enough to capture the different elements of vulnerability and capacity without becoming too complex and cumbersome an exercise. A rapid VCA can be done in a few days, even occasionally a few hours, although a more deliberative and participatory process is generally more desirable. More extensive VCAs may take weeks or months depending on the type of project and the methods used. In all cases, the allocation of funding, time and human resources should be adequate for the purpose of the VCA.

Some VCA methodologies are generic guidelines or provide toolkits from which to select assessment tools for particular exercises. Others have been developed for specific purposes, such as participatory assessment or food security assessment (see Further reading).

VCA will use a variety of sources and types of information, both quantitative and qualitative, to capture the complexity of vulnerability in the project area (see Table 3 for examples). A wide range of social, economic and demographic indicators can be combined with physical (e.g., topography, hazards, buildings, property) and land (e.g., land use) data to assess current vulnerability and predict trends.

Table 3 Tools for assessing socio-economic vulnerability

Methods	*Application to vulnerability*
Secondary data collection and review (official reports, economic surveys, census data, household surveys and other official statistics, research, early warning systems, reports by other agencies, etc.)[4]	Contextual information on a variety of issues including population characteristics, external shocks and stresses (e.g., rainfall and temperature trends), health (morbidity and mortality), previous disasters' impact
Geospatial data (e.g., maps, satellite images, social mapping, transect walks)	Identify physical and environmental features (including hazards), land use, other resources and infrastructure, location of populations and vulnerable sub-groups
Environmental checklists	Questions to gain information about environmental conditions and concerns, revealing the relationship between vulnerable people and their environment (e.g., what role do environmental resources play in resilience? How do environmental hazards, degradation and changes affect communities?)
Sample surveys	Quantitative data on dimensions of vulnerability (e.g., education, employment, health, nutritional status, household economies)

4 This might include use of national-level risk and vulnerability indices (**see Guidance Note 4**).

Methods	*Application to vulnerability*
Interviews (individuals, households, community groups, key informants), focus groups	Information from different perspectives (among communities, other local stakeholders, external experts) on events and trends that cause stress, differential vulnerability and the effectiveness of adaptive behaviour
Individual and household case studies; oral history	Data on different experiences of vulnerability and abilities to withstand environmental hazards and other shocks
Timelines	Historical occurrence and profiles of longer-term events or trends (e.g., floods, droughts, epidemics, environmental trends and cycles)
Seasonal calendars	Describe seasonal events and trends, identifying vulnerability context, livelihood assets and strategies (e.g., rainfall, food levels at different times of year, crop planting and harvesting schedules, food prices, changes in health status)
Preference, matrix and wealth ranking	Reveal vulnerability of different groups' assets to shocks and stresses, and strategies against this
Problem tree	Identifies problems and their causes, and indicates possible solutions
Venn diagrams and other institutional appraisal/mapping methods	Social capital, relations between groups, institutional and policy environment
Scenarios and computer simulations	Explore possible future outcomes and model social–environmental interactions over time

Sources: CARE/TANGO International. *Household Livelihood Security Assessments: A Toolkit for Practitioners*. Atlanta: CARE USA Partnership and Household Livelihood Security Unit, 2002. Available at: http://www.kcenter.com/phls/HLSA%20Toolkit_Final.PDF); DFID. *Sustainable Livelihoods Guidance Sheets*. Section 4. London: Department for International Development (UK), 1999–2005. Available at: http://www.livelihoods.org/info/info_guidancesheets.html; IFRC. *Vulnerability and Capacity Assessment Toolbox*. Geneva: International Federation of Red Cross and Red Crescent Societies, 1996. Available at: http://www.proventionconsortium.org/?pageid=43; Twigg, J. *Disaster risk reduction: mitigation and preparedness in development and emergency planning*. London: Overseas Development Institute, 2004. Available at: http://www.odihpn.org/publist.asp; Ziervogel, G. 'Vulnerability Analysis'. Advanced Tools for Sustainability Assessment website. IVM – Vrijie Universiteit Amsterdam, 2006. Available at: http://ivm5.ivm.vu.nl/sat/?chap=20

These tools can be applied in particular sequences to facilitate data gathering and analysis. For example, a VCA might start with collection of secondary data, then use tools that generate general information (geospatial data, maps, transects, historical timelines), followed by seasonal calendars and Venn diagrams, before moving on to focus group discussions and individual household interviews. Data gathered can be analysed by communities and project staff using problem trees.

Because vulnerability is multi-faceted, it is easy to lose sight of particular aspects. The assessment should explicitly identify internal (susceptibility to loss) and external (response to hazards) dimensions of vulnerability. Different sets of data collection tools may be needed for each dimension.

An important feature of vulnerability is that it changes over time. Assessment methods should identify trends, not just take a 'snapshot' of current conditions.

Most VCA frameworks place natural and other hazards explicitly within their broader coverage, and there is evidence in practice of VCAs leading to better hazard awareness and identification. Some practitioners working in particularly hazard-prone areas have found it necessary to further emphasise hazards issues in their VCA methods (see Box 4). This is a question that could be considered in the scoping phase of the VCA (see Step 5).

Box 4 Coverage of hazards in VCAs

In the Philippines, the Citizens' Disaster Response Center and Network of NGOs has used a version of the capacities and vulnerabilities analysis method (see Box 1) since the early 1990s as part of a community-based and development-oriented approach to disaster management. It has added a hazards, vulnerabilities and capacities assessment exercise, complementing the standard CVA, as an initial step in counter-disaster planning. This is undertaken relatively rapidly, but involves greater focus on hazards and their likely impact.

CARE has developed guidelines for programming in conditions of chronic vulnerability in East Africa. The approach is a modification of the organisation's standard household livelihood security assessment method, but places extra emphasis on identifying specific indicators for tracking the onset and impact of external shocks.

Sources: Heijmans, A. and Victoria, L.P. *Citizenry-Based & Development-Oriented Disaster Response: Experiences and Practices in Disaster Management of the Citizens' Disaster Response Network in the Philippines.* Quezon City: Center for Disaster Preparedness, 2001. Available at: http://www.proventionconsortium.org/themes/default/pdfs/CRA/CBDO-DR2001_meth.pdf; CARE/TANGO International. *Managing Risk, Improving Livelihoods: Program Guidelines for Conditions of Chronic Vulnerability.* Nairobi: CARE East and Central Africa Regional Management Unit and TANGO International, 2003. Available at: http://www.kcenter.com/phls/2003CVGuidelines.PDF

Capturing every aspect of vulnerability can appear to be a huge task. In order to be manageable, an assessment will seek to identify and focus on the most relevant aspects, but this should be a deliberative process within an overall perspective that remains holistic. The complexity of the task must not be used as an excuse for cutting corners.

Step 5. Collect data

Data collection and analysis are shown here as separate activities, for simplicity of presentation, but in practice the process is cyclical, with reviews of initial findings used to guide subsequent data collection, particularly in participatory assessments. For example, initial data collection activities might identify elements at risk, the principal hazards and other external threats, vulnerabilities directly associated with these threats and key capacities. Supplementary information gathering would be needed for analysis of the underlying socio-economic and environmental pressures causing the vulnerability.

Scoping. The scoping phase generates a broad picture of vulnerability in the project area or affecting it, highlights key issues and priorities and identifies information gaps. This phase relies on secondary data, including maps. Some secondary data collection may take place at a very early stage in project preparation to inform more detailed VCA design.

Detailed data collection. This stage sees more emphasis on collection of additional primary data to complement and challenge the secondary data findings. Full use should be made of existing secondary data but these should not be allowed to dominate the assessment.

Community-level and participatory VCAs are likely to give more weight to primary data findings and use secondary sources to cross-check information generated in the field. This approach often supplies detailed information and insights regarding local conditions. It also allows different groups of vulnerable people to set out their needs and priorities and to challenge externally imposed views and agendas. Participation is, therefore, seen as an essential element in any VCA.

Findings from local-level assessment exercises can feed into VCA and decision-making at a higher level or on a larger scale,[5] although it may be difficult to compare the results from several local-level assessments where these have not used standardised methods.

5 For a methodology for doing this, see ActionAid, *Participatory Vulnerability Analysis: a step-by-step guide for field staff.* London: ActionAid, undated. Available at: http://www.actionaid.org/wps/content/documents/PVA%20final.pdf

Box 5 Outputs and use of vulnerability and capacity analysis

VCAs can generate many different kinds of information, presented and used in a variety of ways, for both improved disaster management and socio-economic development.

In Albania, a VCA carried out by the Albanian Red Cross in 2004, with support from the United Nations Development Programme and the United Kingdom's Department for International Development (DFID), focused on high-risk locations and community experiences and perceptions. A range of data-collection methods was used to provide information on hazard events and their impact, response activities by local and national government, NGOs and international agencies, community understanding of vulnerability and its causes, local views of the effectiveness of official emergency services and people's willingness to volunteer for emergency work. The study made numerous recommendations for strengthening central and local emergency management capacity, which were implemented through a new National Civil Emergency Plan.

In the Caribbean island of Montserrat, the government commissioned an integrated vulnerability analysis in 2002 to present the history of natural and technological hazards, determine the vulnerability of existing and proposed development areas to natural hazards, consider physical and social infrastructural needs and make disaster mitigation recommendations for development planning and disaster management. The outputs generated were primarily in the form of maps, which, though insufficiently detailed for some disaster management purposes, were used alongside government economic and trade statistics, social surveys, a participatory poverty assessment and other data to inform the island's new Sustainable Development Plan.

Sources: UNDP Albania/Albanian Red Cross. *Local Vulnerability and Capacity Assessment in Albania: study report.* Tirana: United Nations Development Programme Albania and Albanian Red Cross, 2004; Ministry of Local Government and Decentralisation. *National Civil Emergency Plan of Albania.* Tirana: Ministry of Local Government and Decentralisation, 2004. Both available at: http://www.undp.org/bcpr/disred/english/regions/europe/albania.htm; Smith, D. *Montserrat Integrated Vulnerability Analysis.* Vulnerability Applications and Techniques website, 2002. Available at: http://www.csc.noaa.gov/vata/VATIII_DSmith.pdf; CDERA. *Status of Hazard Maps, Vulnerability Assessments and Digital Maps: Montserrat.* Bridgetown: Caribbean Disaster Emergency Response Agency, 2003. Available at: http://www.cdera.org/projects/cadm/docs/montserrat_hmvadm.pdf; Government of Montserrat. *Montserrat Sustainable Development Plan 2003–2007.* Government of Montserrat, 2003. Available at: http://www.devunit.gov.ms/documents/mni_sdp_03_07.pdf

Step 6. Analyse data

This step is often the most difficult because of the volume and diversity of data collected. As a result, in some cases the findings of a VCA are more descriptive than analytical, especially where the data are primarily qualitative. This can make it difficult to set priorities for intervention.

There can be no single measure of vulnerability, owing to its multi-faceted nature and multiple causes. Weighting of diverse indicators is difficult. Some aspects of vulnerability and loss (e.g., lives, infrastructure, housing, crops, incomes) are often easier to measure than intangible and unquantifiable aspects (e.g., social cohesion, community structures, cultural losses) although the latter may be equally important. Careful triangulation of the different indicators is needed to build up an overall picture. Use of local knowledge and perspectives can be of great help here in identifying priorities.

The different dimensions of vulnerability have to be linked to present a full picture and to reveal cause–effect linkages. Data on the location, nature and severity of hazards should be reviewed against information on the exposure and resilience of different elements at risk. Estimating resilience to future hazard events is a predictive exercise that is likely to involve some assumptions, which should be stated clearly in the assessment report.

Step 7. Decision-making and action

VCA is a diagnostic tool, but by facilitating understanding of present and potential future situations it helps to direct interventions. Actions that result from a VCA should take the form of improvements to project design and implementation that increase community resilience (including development of new activities to support vulnerable groups), changes in the thinking and practice of the operational agency itself, or policy changes at a higher level.

Specific actions resulting from VCAs might include:

- Selection of alternative project sites (or, in the case of agricultural projects, alternative crops).
- Shift of emphasis to different economic and livelihood activities, or a different mixture of such activities.

- Introduction of economic support mechanisms (e.g., micro-credit, cash for work) and social support systems to increase the resilience of vulnerable communities.
- Repair, strengthening or redesign of vulnerable infrastructure and facilities.
- Relocation of vulnerable communities and facilities.
- New land use, planning or building regulations.
- Preparation of disaster mitigation and preparedness plans.
- Strengthening institutions and communities to enable them to implement recommended actions and provide a basis for initiating future actions.
- Formal contributions to policy debates, especially regarding the broader, underlying pressures contributing to vulnerability in the project area.

In project planning, VCA findings usually feed into broader risk analysis. In practice, the distinction between risk and vulnerability is sometimes blurred and some guidelines present vulnerability and risk analysis as a combined exercise.

At each decision-making stage in the project planning process, VCA findings should be referred to and the impact of those decisions on vulnerability considered. Analyses should be transparent and available to all those who produce and use the information.

Ideally, VCA should be an ongoing process during the project cycle, because vulnerability is itself dynamic. Follow-up VCAs can assess changes resulting from the project and external factors that might require subsequent modifications to project design and delivery. In practice, this rarely happens. VCA can also be a tool for monitoring and evaluation, by identifying changes in baseline conditions (**see Guidance Note 13**).

It is also useful to evaluate the VCA process itself and use those lessons in subsequent assessments.

4. Critical factors for success

- Maintaining a holistic view is crucial to create a comprehensive and coherent analysis.
- Vulnerabilities should always be assessed alongside capacities.
- VCA requires a mix of methods and tools, fitted to the project's scope and purpose and adapted to local conditions.
- The approach taken must be manageable, bearing vulnerability's complex nature in mind.
- Analysis should not be over-elaborate but geared to decisions about interventions based on identification of those components of vulnerability that are most relevant to the project and that the project is capable of addressing.
- Project teams should possess skills for collecting and analysing different types of data (including facilitation skills for participatory assessment).
- Participation of vulnerable people is an essential part of the process.
- Because vulnerability is not simple, and the data will be diverse, organisations carrying out VCAs may have to put some effort into reaching a consensus on priorities regarding how to proceed.
- Carrying out a VCA can raise expectations that the development organisation concerned will intervene to solve all the problems identified. This is rarely possible. It is therefore important to discuss the project's purpose and likely outcomes with other stakeholders at the outset.

Box 6 **Hazard and disaster terminology**

It is widely acknowledged within the disaster community that hazard and disaster terminology are used inconsistently across the sector, reflecting the involvement of practitioners and researchers from a wide range of disciplines. Key terms are used as follows for the purpose of this guidance note series:

A *natural hazard* is a geophysical, atmospheric or hydrological event (e.g., earthquake, landslide, tsunami, windstorm, wave or surge, flood or drought) that has the potential to cause harm or loss.

Vulnerability is the potential to suffer harm or loss, related to the capacity to anticipate a hazard, cope with it, resist it and recover from its impact. Both vulnerability and its antithesis, *resilience*, are determined by physical, environmental, social, economic, political, cultural and institutional factors.

A *disaster* is the occurrence of an extreme hazard event that impacts on vulnerable communities causing substantial damage, disruption and possible casualties, and leaving the affected communities unable to function normally without outside assistance.

Disaster risk is a function of the characteristics and frequency of hazards experienced in a specified location, the nature of the elements at risk, and their inherent degree of vulnerability or resilience.[6]

Mitigation is any structural (physical) or non-structural (e.g., land use planning, public education) measure undertaken to minimise the adverse impact of potential natural hazard events.

Preparedness is activities and measures taken before hazard events occur to forecast and warn against them, evacuate people and property when they threaten and ensure effective response (e.g., stockpiling food supplies).

Relief, rehabilitation and *reconstruction* are any measures undertaken in the aftermath of a disaster to, respectively, save lives and address immediate humanitarian needs, restore normal activities and restore physical infrastructure and services.

Climate change is a statistically significant change in measurements of either the mean state or variability of the climate for a place or region over an extended period of time, either directly or indirectly due to the impact of human activity on the composition of the global atmosphere or due to natural variability.

Further reading

Directories of methods and case studies
ProVention Consortium, Community Risk Assessment (CRA) Toolkit: http://www.proventionconsortium.org/?pageid=39

Vulnerability Assessment Techniques and Applications (VATA) website: http://www.csc.noaa.gov/vata/

These mostly cover local- or community-level analysis. For methodological guidance on national-level assessments, see the World Bank's Social Risk Management web pages: http://www.worldbank.org/srm

Methodological discussions
Anderson, M.B. and Woodrow, P.J. *Rising from the Ashes: Development Strategies in Times of Disaster.* London: IT Publications, 1998. 2nd ed.

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6 The term 'disaster risk' is used in place of the more accurate term 'hazard risk' in this series of guidance notes because 'disaster risk' is the term favoured by the disaster reduction community.

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