Department for International Development

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Multi-Hazard Disaster Risk Assessment (v2)

This How to Note is part of a series of Guidance Notes designed to assist DFID Country Offices in embedding disaster resilience in their country programmes. This note is a step by step guide to enable Country Offices to carry out a Multi-Hazard Disaster Risk Assessment and will be updated as lessons are learned from the roll-out of the process. It should be read alongside the Minimum Standards for Embedding Disaster Resilience in DFID Country Offices.

Introduction

The DFID Business Plan for 2012-2015 commits DFID to embed disaster resilience in at least eight DFID Country Offices by March 2013 and all DFID Country Offices by 2015[1]. This document sets out the core steps for conducting a multi-hazard risk assessment to help a Country Office to meet the Business Plan commitment.

Work on disaster resilience or disaster risk reduction is not new. But the aim of building disaster resilience across the portfolio will be new for many DFID Country Offices. Embedding disaster resilience means ensuring investment decisions are informed by disaster risks and that programmes are designed or adapted to be resilient to one-off, regular or on-going disasters.

Building disaster resilience is an important way of protecting gains in poverty reduction and saving lives in the face of shocks and stresses. It is also good value for money. A UK-funded study found that in Kenya - over a 20 year period - every $1 spent on disaster resilience would result in $2.9 gained in the form of reduced humanitarian spend, avoided losses and development benefits.

Approach and resources for undertaking risk assessments

Carrying out a multi-hazard risk assessment is the first step in preparing a disaster resilience country strategy. This How to Note sets out a framework for undertaking the assessment. A number of approaches and methodologies could be employed for each step, though as far as possible, the process should be light touch and make use of existing information.

Given that the aim is to embed disaster resilience in DFID Country Programmes, it is important to bring in a broad section of the Country Office into the process. This will help to build understanding and consensus about the risks faced. Some staff, such as humanitarian, climate change and social protection advisers, will already have detailed knowledge to tap into. Other UK Government staff (FCO, BIS, MOD), may also be interested in participating in the process. This tool should also be used as a first step for disaster preparedness.

It will also be important to engage the expertise and information of a number of national and international partners. This could include:

- host Governments: National Disaster Management Agencies, meteorological offices;
- UN**:** UNISDR, UNOCHA and UNDP;

[1] This includes DFID's regional engagement in the Caribbean and Sahel.

- IFIs: World Bank, GFDRR and regional development banks;
- private sector: insurance companies and risk modellers; and
- academia, other donors and NGOs.

A list of potential data sources and links to key websites are provided at the end of the guidance.

CHASE has scaled up human and financial resources to help support Country Offices embed disaster resilience. If required, CHASE will be able to deploy Disaster Resilience Advisers, external experts and limited catalytic financing to support this assessment work.

Multi-Hazard Risk Assessment summary[2]

Topic	Detail	Methodology	Data Sources
Hazard	• What shocks or stresses? • Where might it happen? • Scale and trends? • Impacts and potential fatalities	• Secondary data analysis • Interviews with key stakeholders • Historical data, e.g. evaluations. • Early Warning Systems	• IPCC, FEWSNET • Maplecroft and others
Vulnerability	• Who are most vulnerable? • Where are the most vulnerable? • Why are they vulnerable? • What makes them vulnerable? • What assets are vulnerable?	• Poverty assessments • Humanitarian evaluations • PDNAs • Household surveys • Historical data	• Government, UNOCHA, UNISDR, UNDP. NGOs Red Cross/Red Crescent
Capacity of government and other stakeholders?	• Who are the stakeholders? • What are the government structures, policies and capacities? • Where is the leadership? • What are others stakeholders' roles and actions? • Political economy of decision making	• External analysis • CAS's, PRSPs and country strategies • Household surveys • Research reports	• Government departments + partner agencies • UN • NGOs
Overall assessment of impact	• Economic, social, environmental, political impacts and potential fatalities • Review of potential scenarios • Priorities for action	• Risk matrix	
What is DFID doing and what should it do on resilience	• Knowledge and experience • Skills and capacity • Whether mainstreamed or programmatic • Level of ambition what DFID should do with national government and partners	• Operational plans, BAR bids, Business Cases. • Capacity and skills analysis	• C-O advisers and programme managers • Partners • Vertical programmes

[2] More details on potential sources of data are available.

Stages of a multi-hazard risk assessment:

Risk is a function of hazard exposure, vulnerability and coping capacity as shown below.

$$Risk = \frac{Hazard\ Exposure\ x\ Vulnerability}{Coping\ Capacity}$$

The stages in a multi-hazard risk assessment take each factor in turn to provide an overview of the risks.

1) Magnitude and likelihood of hazards

The risk assessment should begin with the identification of **what natural hazards can be expected** and how they might change in the short and medium term as a result of climate change. This could include earthquakes, volcanic eruptions, floods, drought, cyclones and epidemics. Consideration should be given to both extensive (frequent, low impact) and intensive (occasional, high impact) events. It should identify where the hazards are likely to occur and their expected occurrence (e.g. within one year, five years). Where present, probabilistic modelling will help provide an estimate of the likelihood of a specific event causing a certain level of loss (e.g. the probability of an earthquake occurring within five years that will cause $100 million loss).

Potential Hazards

Geophysical	**Climatological**
Earthquake	Drought
Landslide	Forest/Bush Fire
Tsunami	Frost
Volcanic Eruption	Hail
	Heat wave
Meteorological/Hydrological	**Biological**
Flood	Crop Pest and Diseases
Storm Surge	Human Epidemics
Storm/Cyclone/Hurricane	Livestock Pests and Diseases

Disaster resilience, climate change and other factors	***Disaster resilience and conflict***
Climate change has increased, and will continue to increase, the number of disasters caused by sudden extreme climatic events. The impact of climate change on disaster resilience therefore needs to be considered. The risk assessment and disaster resilience strategy also need to take into account broader issues that will have implications on vulnerability and disaster risk. This could include population increase, migration and price rises.	In fragile and conflict-affected states, disaster resilience needs to be considered alongside conflict sensitivity. Conflict can pose a humanitarian threat in itself, as well as exacerbating vulnerability to other hazards. Interventions to promote disaster resilience need to ensure that they do not exacerbate underlying causes of conflict. In assessing hazards such as conflict or outbreaks of violence, it will be useful to draw on cross-UK Government conflict early warning material as well as political analysis – for example a Joint Analysis of Conflict and Stability.

2) Vulnerability analysis

This part of the assessment should:

a) identify **who are the most exposed and vulnerable populations** to potential hazards;
b) identify **what assets are most exposed** to potential hazards;
c) assess **the nature and factors contributing** to their vulnerability; and
d) estimate the **susceptibility to hazards**.

The poorest people often live in hazardous places, for example on the steep slopes of hillsides or rivers and so are at higher risk of harm from landslides and floods. Vulnerability will vary by age, gender and ethnic group. In earthquake zones it is not always the poorest who are the most vulnerable as urban middle class areas may be poorly built. But assets, such as utilities and critical infrastructure (roads, ports, airports) should also be considered. Mapping where the most vulnerable live and scenario planning potential impacts and fatalities is useful for emergency preparedness and contingency planning.

The factors contributing to vulnerability could stem from a range of different issues, including the extent to which building standards and codes have been followed, the quality and strength of infrastructure, accessibility of basic services, the scale of poverty and income opportunities, land tenure and the level of financial protection.

3) In-country capacity to address disaster risk

This part should look at the national, provincial and local capacity to cope with disasters. This would include the policies, planning and investment that are in place or in the pipeline to build disaster resilience. The analysis should be broken down for each of the core stakeholder groups that should be engaged (national and local government, donors, UN and IFIs, NGOs, private sector and academia).

It should also cover the broad range of action: prevention, mitigation and emergency preparedness through to disaster response, recovery and reconstruction.

Within government, it should give a sense of what are the structures, relevant departments, policies and capacities and what is the level and ambition of leadership? Additionally, what are the legal, institutional and budgetary frameworks for disaster management? One of the core elements to assess here is the political economy of disaster resilience in the country, which will provide a sense of the political commitment to this agenda, the levels of investments, the relations between different government departments and between the centre and local government, the levels of corruption and the impacts on standards and accountability.

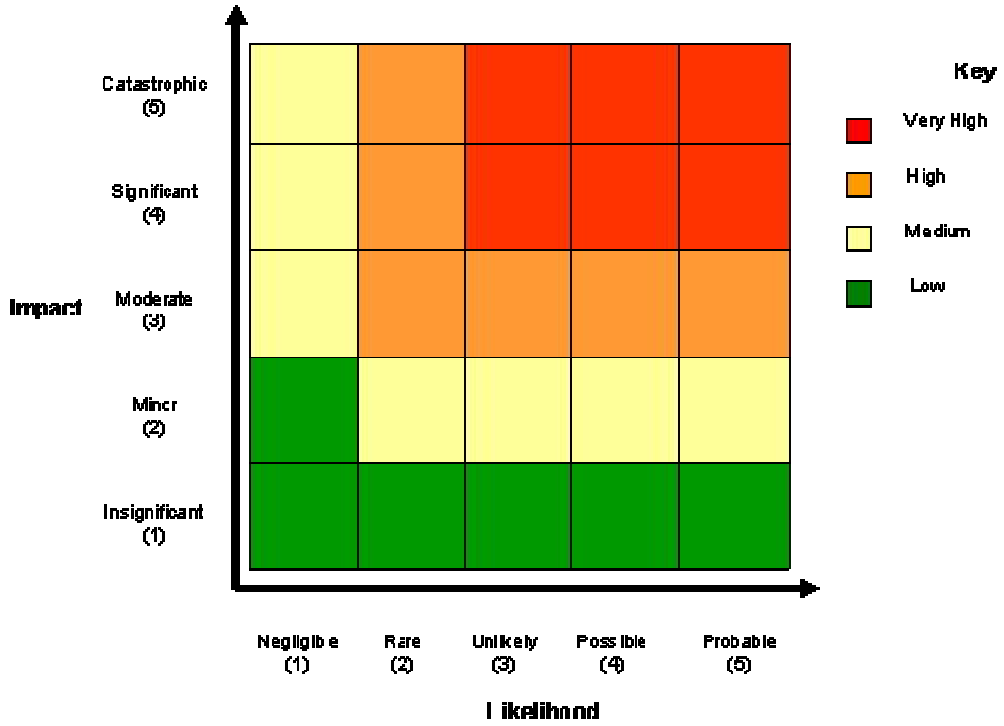
4) Overall impact assessment

Estimating the potential impact of hazards will need to be derived from analysis of previous events, taking stock of improvements that will have reduced vulnerability, as well as any probabilistic modelling that exists (such as through the World Bank, UN or insurance industry).

Potential impacts from hazards, amongst others, are:

- **economic** through destruction/damage to infrastructure and businesses;
- **social** through the death of family members, breakdown of networks and trauma;
- **environmental** as an immediate consequence of the disaster, but also due to the reaction of the effected community and the humanitarian response; and
- **political** impacts due to a government's inability or lack of willingness to respond.

Consideration could be given to generating a risk matrix for depicting the relevant impact and likelihood of certain events. The example below is used by OECD and the Cabinet Office.



5) What is DFID doing and what should it do?

This section should provide an analysis of the relative impact and likelihood of potential hazard scenarios and consider what should be of priority concern for the National Government and DFID. The summary should also identify what are the principal and priority gaps of the National Government and other stakeholders in addressing disaster risk and building resilience.

The potential impact that these hazards could have on DFID's current and pipeline portfolio of programmes within the country and the extent to which these are currently geared to minimise risk or strengthen resilience should be assessed. For example, it could assess the potential impacts that specific hazards could have on an education programme and the extent to which these are already being considered. The pipeline should also be assessed for future gaps in programming for disaster resilience.

This section should also assess DFID's own knowledge, experience, skills and capacity regarding disaster resilience.

1. Is resilience programming on-going in climate, DRR, social protection or other parts of the country programme or through DFID vertical programmes?
2. What are the connections between different areas of programming and policy and where can synergies add value?
3. What are the opportunities for building stronger links with other Country Office planning processes?

The completed risk assessment will provide the basis for the disaster resilience strategy. Eventually the strategy will become part of the Country Office Operational Plan and will inform programme design and development.

Useful links

Listed below are some useful links to refer to when carrying out a multi-hazard risk assessment. Contact CHASE for more resources.

Maplecroft

Maplecroft use GIS (Geographic Information System) mapping technology to offer insight and enable the assessment of risk and trends at global, national, city, factory or pipeline level. DFID has subscribed to the Bronze membership and DFID staff can register to access the website using their DFID email address. They offer over 160 interactive issue maps which draw on 500+ risk indices and indicators.

Global Risk Data Platform. http://preview.grid.unep.ch/index.php?preview=home&lang=eng**.**

A multi-agency effort to share spatial data information on global risk from natural hazards. It is possible to visualise, download or extract data on past hazardous events, human & economical hazard exposure and risk from natural hazards.

UN University and Bündnis Entwicklung Hilft – World Risk Report and Index (2011).

http://www.weltrisikobericht.de/Bericht.435.0.html?L=3

As part of this study an index was developed to calculate the risk values of 173 countries worldwide. The index calculates the exposure of countries to natural hazards, as well as their vulnerability (in terms of susceptibility, coping and adaptation). The report was launched in 2011 and presents the findings of these calculations. The index ranks countries into risk categories.

Global Facility for Disaster Reduction and Recovery (GFDRR)

http://www.gfdrr.org/gfdrr/sites/gfdrr.org/files/publication/DRM_CountryPrograms_2011.pdf

Disaster Risk Management Programs for Priority Countries has data on 31 countries, including risk profiles, details of government agencies working on disaster risk management, agencies active in risk mapping, key donor engagements.

Centre for Research on the Epidemiology of Disasters. http://www.cred.be/

The Centre undertakes research and provides an evidence base on the burden of disease and health issues arising from disasters and conflicts to improve needs-based preparedness and responses to humanitarian emergencies.

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