

# An inventory of existing risk profiles on climate change and extreme weather

Desk study



## Advisory Report by the Dutch Sustainability Unit

**Subject:** An inventory of existing risk profiles on climate change and extreme weather

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# 1. INTRODUCTION

The DSU received a request from DGIS/DME on April 24, 2013 to make an inventory of risk profiles regarding climate change and extreme weather. The background for this request is as follows. The Dutch Government has 4 spearheads for its development cooperation policy for the coming period (women's rights and sexual and reproductive health and rights, water, food security and safety and rule of law) and the integration of 3 cross-cutting issues – Environment/Climate, Gender and Good Governance.

Also Embassies and the Central Directions of the Ministry of Foreign Affairs are expected to mainstream climate risks in their policies/program development and implementation. In practice however, climate change is not sufficiently in the picture of Embassy and Central Directions staff. It is assumed that greater knowledge about risk profiles on climate change and extreme weather contributes to an increased awareness on the importance of integration of climate change in the working practise, such as:

- Climate proofing of interventions of investment programs;
- Adequate adaptation measures within new or ongoing programs;
- Co-ordination with national actors, other donors and NGO's in partner countries in the framework of disaster preparedness;
- Comparable co-operation and co-ordination at international level.

The DSU has been asked to deliver the following result for the 15 OS-focus countries (Afghanistan, Bangladesh, Benin, Burundi, Ethiopia, Ghana, Indonesia, Yemen, Kenya, Mali, Mozambique, Uganda, Palestinian Territories, Rwanda and South Sudan):

- an inventory of existing risk profiles on climate change and extreme weather, or
- conclude that such risk profiles are not available.

Disaster Risk Reduction is one of the five main elements of the climate policy of Minister Ploumen. Risk profiles are useful to prevent considerable damage as a result of climate change. DGIS however does not intend to re-invent the wheel, which is the reason for an inventory of existing risk profiles in the 15 OS countries. E.g. WHO, UNEP, World Bank or other relevant international organisations may have developed such risk profiles already. In that case it is only necessary to compare and advise to DGIS which type is the most suitable one and how Embassies can make use of these.

This inventory has, at the request of DGIS, and given the short time span a 'quick and dirty' character, through an internet search and interviews (see annex 1 of resource persons interviewed) with relevant organisations in the Netherlands and elsewhere. The DSU has co-ordinated the request and reports its finding below. Chapter 2 gives an overview per (inter)national organisation and Chapter 3 presents an overview per country in matrices. Chapter 4 presents some overall conclusions and recommendations. Three other appendices give further details.

## 2. FINDINGS PER ORGANISATION

### 2.1 International organisations

#### 2.1.1 World Bank Climate Change Knowledge Portal

In an effort to serve as a 'one stop shop' for climate-related information, data, and tools, the World Bank created the Climate Change Knowledge Portal (CCKP), supported by the Global Facility for Disaster Reduction and Recovery and others. The CCKP provides a web-based platform to assist in capacity building and knowledge development. The aim of the portal is to help provide development practitioners with a resource to explore, evaluate, synthesize, and learn about climate related vulnerabilities and risks at global, regional and country level. Using climate science research results to inform the decision making process concerning policies or specific measures needed to tackle climate impacts, or even to understand low carbon development processes, is often a difficult, yet crucial, undertaking.

The CCKP contains environmental, disaster risk, and socio-economic datasets, as well as synthesis products, such as **the Climate Adaptation Country Profiles**, which are built and packaged for specific user-focused functions such as climate change indices for a particular country. The portal also provides intelligent links to other resources and tools. The CCKP consists of spatially referenced data visualized on a Google Maps interface. Users are able to evaluate climate-related vulnerabilities, risks, and actions for a particular location on the globe by interpreting climate and climate-related data at different levels of details. See also 2.2.4 and Annex 2.

[http://sdwebx.worldbank.org/climateportalb/home.cfm?page=country\\_profile](http://sdwebx.worldbank.org/climateportalb/home.cfm?page=country_profile).

The Portal contains information on 48 countries of which 9 show overlap with the 15 OS countries, namely: **Bangladesh, Ethiopia, Ghana, Indonesia, Kenya, Mali, Mozambique, South Sudan and Yemen.**

#### 2.1.2 UNDP Climate Change country profiles

The objective of the United Nations Development Programme (UNDP) **Climate Change Country Profiles** project is to make use of existing data to generate a collection of country level analyses of recent climate observations and the multi-model projections. The project uses a consistent approach for all countries studied to produce an “off the shelf” analysis of the data to provide basic observed and model output summaries, and also makes available the underlying data for each country in smaller, and thus more manageable, files for each country.

For each countries, a report contains a set of maps and diagrams demonstrating the observed and projected climates as country average time series as well as maps depicting changes on a 2.5° grid and summary tables of the data. A narrative

summarises the data in the figures, and placing it in the context of the country's general climate. A dataset containing the underlying observed and model data for that country, is made available for use in further research projects. The files are smaller, more manageable and in text format which can easily be downloaded, read and manipulated. See also 2.2.4 and Annex 2.

<http://www.geog.ox.ac.uk/research/climate/projects/undp-cp/>

From the 52 Countries included in the UNDP Climate Change Country Profiles project, there are 9 overlapping the OS focus countries, namely: **Benin, Ethiopia, Ghana, Kenya, Mali, Mozambique, Uganda, Afghanistan and Yemen.**

### 2.1.3 UNFCCC

Between 2004 and 2011 almost 50 National Adaptation Programmes for Action (NAPAs) have been made available to the UNFCCC Secretariat which can be found here:

[http://unfccc.int/cooperation\\_support/least\\_developed\\_countries\\_portal/submitted\\_napas/items/4585.php](http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php)

10 of the 15 OS focus countries have these NAPAs namely: **Afghanistan, Bangladesh, Benin, Burundi, Ethiopia, Mali, Mozambique, Rwanda, Uganda and Yemen.**

### 2.1.4 Intergovernmental Panel on Climate Change (IPCC)

The IPCC was established by the United Nations Environmental Programme (UNEP) and the World Meteorological Organization (WMO) in 1988 to assess the scientific, technical and socio-economic information relevant for the understanding of human induced climate change, its potential impacts and options for mitigation and adaptation. The IPCC has completed four full assessment reports, guidelines and methodologies, special reports and technical papers.

The IPCC Working Group II assesses the vulnerability (sensitivity and adaptability) to climate change of, and the negative and positive consequences for, ecological systems, socio-economic sectors and human health, with an emphasis on regional, sectoral and cross-sectoral issues.

The IPCC has started the Fifth Assessment cycle, which will include the Fifth Assessment Report. The Working Group II contribution to this report, "Climate Change 2013: Impacts, Adaptation, and Vulnerability", will be released in March 2014.

<http://www.ipcc-wg2.gov/index.html>

Although there is not a specific country focus, the following IPCC document published in 2012: Summary for Policymakers. In: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation is worthwhile reading:  
[http://ipcc-wg2.gov/SREX/images/uploads/SREX-SPMbrochure\\_FINAL.pdf](http://ipcc-wg2.gov/SREX/images/uploads/SREX-SPMbrochure_FINAL.pdf)

### 2.1.5 Swedish International Development Agency (SIDA)

SIDA has carried out a series of desk studies (ranging from 2006 to 2011) resulting in so-called Environmental and Climate Change Policy Brief for several countries. In line with the Swedish development cooperation goal the documents aim to summarise the key issues pertaining to environment and climate change related to poverty reduction and economic development. The aim is to facilitate integration of environment and climate change risks and opportunities into Swedish Development Cooperation. The policy briefs also aim to provide a reference when discussing individual interventions under the future strategy, both among Sida staff and where appropriate cooperation partners. These environmental policy briefs are available at SIDA's helpdesk for Environment and Climate Change:

[http://sidaenvironmenthelpdesk.se/?page\\_id=15](http://sidaenvironmenthelpdesk.se/?page_id=15)

From the 35 available country policy briefs, the following overlap with the 15 OS focus countries: **Bangladesh, Ethiopia, Indonesia, Mali, Mozambique, Rwanda and Uganda**

### 2.1.6 Miscellaneous

#### Other donor agencies

A quick search among DFID, FINNIDA, DANIDA, DFID, NORAD, AfDB, CIDA and GIZ did not reveal any specific country risk profiles. AusAID does have some country profiles, but these are related to countries in the Pacific. There are also some country risk profiles in the Caribbean.

#### Adaptation Learning Mechanism Country Profiles (GEF, UNDP, FAO, UNFCC, UNEP, USAID)

The ALM's Country Profiles contain national information on how individual countries are addressing climate change adaptation, including National Adaptation Programs of Action, National Communications, climate change scenarios, impact assessments, and relevant strategies. This information is available for all OS focus countries except for South Sudan and the Palestinian Territories. See also 2.2.4 and Annex 2.

<http://www.adaptationlearning.net/country-profiles>



## 2.2 National organisations

### 2.2.1 Partners for Resilience – Netherlands Red Cross (lead agency), Cordaid, CARE Netherlands, Wetlands international, Red Cross Red Crescent Climate Centre

Partners for Resilience (PFR) contribute to the resilience of communities by integrating climate change adaptation and ecosystem management and restoration into Disaster Risk Reduction (DRR). With this integrated approach, communities strengthen their capacities to reduce the impact of disasters. They also believe a community approach will be strengthened if the institutional environment can be made more conducive to climate and ecosystem DRR, and they engage with civil society and government actors to apply a combined approach.

Partners for Resilience consists of 5 Netherlands-based partners and 74 Southern partners, all with specific mandates and expertise in DRR. By joining forces, the partners believe they can make a difference where humanitarian, developmental and environmental gains can be won. The PFR have also established cooperation with knowledge centers worldwide such as Wageningen, Colombia and Yale universities.

The PFR web-site contains 1 page information for 9 countries about Natural hazards and disasters, Effects on people, What PFR does and an example project.

<http://www.partnersforresilience.nl/paginas/home.aspx#>

PFR has activities in 9 countries of which 5 overlap with the 15 OS countries, namely **Ethiopia, Indonesia, Kenya, Mali and Uganda**

The PFR partners are:

#### **Netherlands Red Cross (lead agency)**

The NLRS contributes to poverty reduction by reducing people's vulnerability and protecting their health, livelihoods and socio-economic base. NLRC activities include mapping and analysis of risks, reducing disaster risks, early warning and evacuation, the organization of rescue teams, and building emergency supplies.

#### **Cordaid**

Cordaid works with local organizations and authorities, supporting communities to identify the risks themselves, both from natural and man-made disasters and political or economic conflicts. Through Cordaid's approach, communities increase their own resilience, prevent disasters and safeguard their lives and livelihood assets.

In 2012, Cordaid made a series of **disaster risk mappings and analyses** for (initially) 14 countries (out of 25) including an analysis of the natural hazards, conflicts, environmental and health risks. These assessments are based on the premises that natural disasters are a function of exposure to hazards, vulnerability and capacities. The risk mapping is to be used as for internal use by Cordaid and its partners.

These risk mappings (around 10 p.) contain facts and information on man-related hazards and conflicts, natural hazards, vulnerability, government capacity and all have a synthesis, an overview of resources & contact persons. An appendix contains a 1 page hazard map and/or conflict map.

The risk mapping is based mostly on desk research making use of websites and databases, with additional information derived from interviews. In a 14 p. Disaster Risk Mapping Analysis & Discussion document, an overview is given of the 14 countries and the main hazard events that can occur on the short or long term and the number of people that may be affected. This document also contains an overview of web-sites used, especially the ones on natural disasters contain useful information (see annex 4).

Fourteen priority countries have been selected, mainly based on numbers of people at risk. The 8 countries overlapping with the OS focus countries are **Afghanistan, Bangladesh, Burundi, Ethiopia, Indonesia, Kenya, Uganda and South Sudan.**

#### **CARE Netherlands**

CARE recognizes and supports groups in marginalized positions, such as women and girls, indigenous people, youth and elderly, and people with disabilities. At the core of its work on resilience, CARE Netherlands analyses the root causes of vulnerability, creates ownership of communities, and links local solutions with scientific knowledge.

#### **Wetlands International**

Wetlands International is an independent, non-profit, global organization that targets sustaining and restoring wetlands, their resources and biodiversity. The organization believes healthy wetlands are a cost-effective strategy for DRR and Climate Change Adaptation, with strong benefits for poverty reduction and biodiversity conservation.

#### **Red Cross Red Crescent Climate Centre**

The Climate Centre helps the Red Cross Red Crescent Movement and other humanitarian agencies reduce the impacts of climate change and extreme-weather events on vulnerable people already confronted with a sharp increase in weather-related disasters. In forging links between climate scientists, policy-makers, health practitioners and disaster managers, the Centre enables a flow of resources and information to better manage the rising risk of extreme-weather events.

The Red Cross Climate Centre has an expert role, and **develops climate risk assessments** in a way that is not only scientifically sound, but also applicable in programs and projects. This is also shown through its contributions to documents like: "Minimum Standards for local climate smart Disaster Risk Reduction" and "Entry points for climate smart program development".

The climate risk assessments are not meant to be static products, but should rather be considered as a continuous process, whereby a permanent dialogue between program developers and climate knowledge centers is essential. Not only should attention be paid to long term risks, but also to how a better connection can be made with shorter term weather changes via seasonal forecasts which are issued on a monthly basis by the Climate Centre (see [www.climatecentre.org](http://www.climatecentre.org)).

Climate context analyses per country on the climate centre website are available for 9 countries, giving a 1 page overview of Natural climate variability and predictability, Climate Change projections, Climate Change Impacts and a list of sources/references. This is used as input for the PfR website (and therefore are the same countries as mentioned above already: Ethiopia, Kenya, Indonesia, Mali and Uganda)

For 4 countries, the Red Cross Climate centre has made background documents in 2011 on the Preparedness for Climate Change Program: **South Sudan, Indonesia, Rwanda and Bangladesh.**

### 2.2.2 Royal Netherlands Meteorological Institute (KNMI)

KNMI has a wealth of information all around the world on (i) current observations: climatology, trends (averages, extremes), variables (temperatures, precipitation, wind..) and (ii) projections: averages, extremes, variables, time horizons (2100, 2050 etc.). This information is not available per country, but this can be done easily (e.g. within 1 day) through a set of tools which allow 'translation' to third parties in easy accessible information packages. However, as risks are determined by local circumstances, a correct interpretation of this information requires further analysis (couple of months).

KNMI has done this for example in 2011 for Eastern and Southern Africa through a publication called: 'Projected Changes in extreme precipitation in Africa under Global Warming'. Another example is KNMI's involvement in an ongoing joint cooperation program (with e.g. Deltares, Dutch Ministry of Infrastructure and Environment) in Jakarta, Indonesia. This is a risk analysis for a region (20 million people) to investigate the causes (climate change and/or urbanization?) of extreme precipitation. KNMI also works in South-East Asia, on request of the World Meteorological Organization (WMO) on the establishment of a Regional climate data base.

KNMI does not consider risk profiles as their core business, but can make information available for each country and has relevant data for **Indonesia, and Eastern and Southern Africa**

### 2.2.3 Faculty of Geo-information Science and Earth Observation (ITC), University of Twente (UT)

UT-ITC frequently uses existing risk profiles that are available at different organizations and knowledge institutes, but does not have/develop risk profiles themselves. They do contribute to such profiles upon request, for example by doing hazard assessments using climate data and historical inventories of local and regional natural disasters, which are relevant for the risk analysis of potential climate change.

UT-ITC has contributed to this inventory by making use of in-house expertise in the area of climate change and risk analysis of natural disasters and by making use of their current knowledge on existing information sources on risk profiles through internet search. ITC has made overview of international (knowledge) organizations that have information regarding risk profiles concerning the effects of climate change and

extreme weather for developing countries. Also an assessment has been made on whether these organizations provide information regarding vulnerability and exposure of the population in the countries concerned.

The inventory by UT-ITC has identified four other organizations (**GCCA, IFPRI, GFDRR and CDKN**) in addition to the ones already described in Chapter 2.1. However, these did not reveal any new risk profiles per country, except Bangladesh for CDKN.

Although ITC has not been able, given the short time available, to perform quality check of the available risk profiles, they have made an attempt to give an initial judgment of the available information and some recommendations for its use. This is presented in Annex 2 to this report and is summarized in an easy accessible table for the 15 OS countries (in Dutch). Table 2 in this annex presents per organisation and per country which information is available: different symbols and colours distinguish different levels of information. Grey (X) means: no information, Blue (■): climate change including impact, green (□): climate change and extreme weather profile, but no information regarding impact and orange (O), links to information, no risk profile or no profile concerning climate change and extreme weather. An (\*) indicates that there is information regarding disaster risk without a link to climate change. The numbers in the column Prevention web indicate how many publications are available per country through this resource. Annex 3 presents detailed information per country.

#### 2.2.4 WUR/Alterra

WUR/Alterra does not have risk profiles. For the EU however, they have made Climate Adapt, which is an information system for policy makers with a whole range of examples for adaptation strategies for certain settings.

<http://climate-adapt.eea.europa.eu/>

#### 2.2.5 Netherlands Environmental Assessment Agency (PBL)

PBL is the Netherlands institute for strategic policy analysis in the fields of environment, nature and spatial planning. It has publications related to climate change extreme weather and disasters, related to the Netherlands but also with an international focus. PBL does not have specific country profiles.

<http://www.pbl.nl/en/dossiers/Climatechange>

#### 2.2.6 Deltares

Deltares does not have risk profiles per country but has contributed to a publication of the Delta Alliance (with WUR and IHE) called: Comparative assessment of the vulnerability and resilience of 10 deltas (2010). Three of these overlap with the 15 OS countries (Incomati, Mozambique, Ganges-Brahmaputra-Meghna in Bangladesh and Ciliwung in Indonesia). This information can be found on the Delta Alliance web-site:

[www.delta-alliance.org](http://www.delta-alliance.org)

### 3. OVERVIEW PER COUNTRY

#### 3.1 International

	WB	UNDP	UNFCC	IPPC	SIDA	ALM
Afghanistan		x	x			x
Bangladesh	x		x		x	x
Benin		x	x			x
Burundi			x			x
Ethiopia	x	x	x		x	x
Ghana	x	x				x
Indonesia	x				x	x
Kenya	x	x				x
Mali	x	x	x		x	x
Mozambique	x	x	x		x	x
Pal. Territories						
Rwanda			x		x	x
South Sudan	x					
Uganda		x	x		x	x
Yemen	x	x	x			x

#### 3.2 National

	PFR	Cordaid	Climate Centre Red Cross	KNMI	ITC	WUR /Alterra	PBL	Deltares Delta Alliance
Afghanistan		x						
Bangladesh		x	x					x
Benin								
Burundi		x		?				
Ethiopia	x	x		?				
Ghana								
Indonesia	x	x	x	?				x
Kenya	x	x		?				
Mali	x							
Mozambique				?				x
Pal. Territories								
Rwanda			x	?				
South Sudan		x	x					
Uganda	x	x		?				
Yemen								

## 4. ADVICE ON THE USE OF RISK PROFILES<sup>1</sup>

This inventory shows that a lot of information is available among different organisations. Given the short time frame, it has not been possible to get insight in the quality and completeness of the information. The risk profiles of the different organisations per country have not been compared mutually. This may result in contradictions after more a more thorough analysis.

The interpretation of the definition of 'risk profile' determines to a great extent which source is the most adequate one. This inventory has not revealed any sources with incorrect information. The level of detail differs per information source; some give a more general picture, while other focus on one aspect. This implies that the different sources are complementary to each other.

It is important to pose some questions regarding the scientific soundness of the available risk profiles, such as quality of data used for climate change/projections and the risk analyses. In most OS countries, access and availability of data is problematic, causing great uncertainty regarding future projections. The level of uncertainty needs to be analysed, because this may reveal that perhaps a society needs to be made 'climate-proof' first, before any potential future changes are looked at. When such reliable sets of measurements of meteorological parameters over many years are lacking, showing the current situation, it is impossible to project an adequate future situation, e.g. a change as compared to the current climate.

The same applies for the vulnerability of people and economic interests in relation to the current climate, a step which is not always made. This first step is however needed to be able to assess the future situation. Without an assessment of the current state of affairs, a future impact analysis is not possible.

Vulnerability and exposure are equally important elements. The extent of a disaster is namely determined by, on the one hand, the intensity of the natural process, e.g. a flood as a result of extreme weather conditions, and the vulnerability of affected people on the other hand. A flood in Bangladesh will have other impacts than a flood in East Africa. It is a fact that vulnerability and exposure change much faster than climate does: most capitals in the 15 OS countries will show rapid growth in the next 10 years, whereas changes in climate will still have to be manifested. In addition, vulnerability and exposure are very variable in time and space, for example as a result of adaptation. Analysis on these kind of issues is rapidly developing.

The inventory also showed that the spatial scale of climate change, but also that of exposure and vulnerability differs greatly. Some risk profiles contain provinces or a

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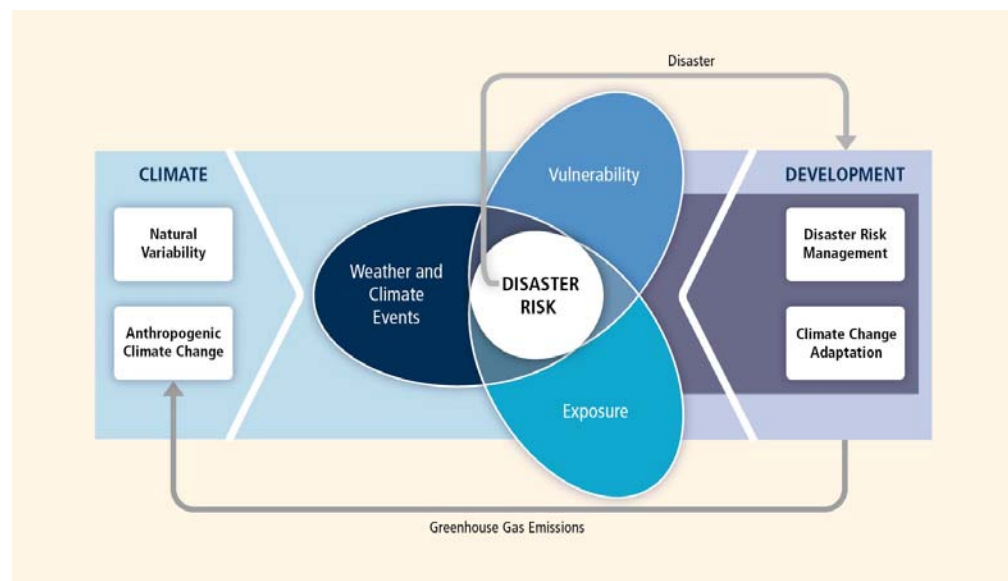
<sup>1</sup> This advice is largely based on the views and perspectives of ITC.

country, whereas the related problems only are relevant at regional or even local level. The exposure of a city, to mention an example, is very much different than that of the surrounding rural areas. These local differences should have been addressed in the risk profiles, but this is not always the case.

As climate science and knowledge is rapidly developing, it needs to be stressed that the most recent information be used. Continuously, new insights are gained in techniques for analysis and interpretation of results. Climate science is focussing more and more on extreme weather to better serve politics and society to be able to identify and apply efficient and adequate adaptation measures. It can be expected that in this area there will new additional information made available shortly.

Final remark:

There is not an unambiguous definition for risk profiles on climate change and extreme weather. The interpretation by different organization can also differ according to the specific goal of such profiles. The same applies to terminology like Disaster Risk Reduction, Disaster Recovery, Disaster Risk Management, Exposure, Hazard Assessment Vulnerability, Impact Assessment and Climate Change Adaptation. The Figure below shows the most important concepts related to disaster risk management and climate change adaptation, and their interaction with sustainable development (IPCC, 2012).



## APPENDICES

An inventory of existing risk profiles on climate  
change and extreme weather

(appendices 1 to 4)



# APPENDIX 1

## Resource persons

### **Cordaid**

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### **WUR/Alterra**

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### **Deltares**

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## APPENDIX 2

### ITC overview of organisations with risk profiles of each country

Tabel 1 geeft een overzicht van de instanties die risico-profielen per land openbaar hebben gemaakt.

<b>Instantie</b>	<b>Website</b>
IPCC	<a href="http://ipcc-wg2.gov/SREX/">http://ipcc-wg2.gov/SREX/</a>
WorldBank – CCKP	<a href="http://sdwebx.worldbank.org/climateportal/index.cfm?page=global_map">http://sdwebx.worldbank.org/climateportal/index.cfm?page=global_map</a>
WorldBank – CRACP	<a href="http://sdwebx.worldbank.org/climateportalb/home.cfm?page=country_profile">http://sdwebx.worldbank.org/climateportalb/home.cfm?page=country_profile</a>
GCCA	<a href="http://www.gcca.eu/technical-and-financial-support/national-programmes">http://www.gcca.eu/technical-and-financial-support/national-programmes</a>
IFPRI	<a href="http://www.ifpri.org/countries">http://www.ifpri.org/countries</a>
GFDRR	<a href="https://www.gfdr.org/node/112">https://www.gfdr.org/node/112</a>
UNDP	<a href="http://www.geog.ox.ac.uk/research/climate/projects/undp-cp/">http://www.geog.ox.ac.uk/research/climate/projects/undp-cp/</a>
Prevention Web	<a href="http://www.preventionweb.net/english/countries/">http://www.preventionweb.net/english/countries/</a>
UNISDR	<a href="http://www.unisdr.org/partners/countries">http://www.unisdr.org/partners/countries</a>
ALM	<a href="http://www.adaptationlearning.net/country-profiles">http://www.adaptationlearning.net/country-profiles</a>
CDKN	<a href="http://cdkn.org/regions/bangladesh/">http://cdkn.org/regions/bangladesh/</a>

Tabel 1 Lijst met instanties die per land klimaatprofielen beschikbaar maken op het internet en de bijbehorende website

#### IPCC

Het IPCC (Intergovernmental Panel on Climate Change) heeft in 2012 een rapport gepubliceerd met de titel "Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX)". In dit rapport staan de belangrijkste bevindingen m.b.t. klimaatveranderingen in extreem weer en de potentiële impact op de gemeenschap. Dit rapport kan gezien worden als de bron met de meest complete achtergrondinformatie gebaseerd op wetenschappelijke internationale publicaties. Het rapport behandelt niet de risicoprofielen van individuele landen, maar is het resultaat van samenwerking tussen drie verschillende takken van wetenschap, te weten a) specialisten in disaster recovery, disaster risk management, en disaster risk reduction, b) experts op het gebied van fysische wetenschappelijke basis van klimaatverandering en c) experts op het gebied van climate change impacts, adaptation, en vulnerability.

#### Wereldbank

De Wereldbank heeft twee programma's waar relevante informatie te vinden is: Climate Change Knowledge Portal (CCKP) en Climate Risk and Adaptation Country Profiles (CRACP). De website van CCKP geeft voor elk land een samenvatting van de historische klimatologie en klimaatprojecties voor impact en vulnerability d.m.v. een interactief format. Wat betreft de historische weergegevens is het onduidelijk welke databronnen gebruikt zijn en hoe compleet de gegevens zijn. Voor de klimaatprojecties zijn gegevens van GCMs (General Climate Models oftewel Global Circulation Models) en Regional Climate Models (RCMs)

beschikbaar. Voor natural hazards zijn er alleen historische gegevens beschikbaar, geen toekomstprojecties. Voor water- en landbouwsector zijn er toekomstprojecties voor overstromingen, droogte en veranderingen in de gemiddelde rivierstand (base flow). Er staat een disclaimer op de website dat deze gegevens niet geschikt zijn voor een ontwerpstudie. De website van de CRACP geeft informatie voor alle 15 landen. Voor een selectie van deze 15 landen is nadere informatie beschikbaar m.b.t. distaster risk reductie en adaptatie aan klimaatverandering. De klimaatprojecties zijn gebaseerd op de CCKP informatie (hier geen aanvullende of nieuwe informatie). De beschrijving omvat een klimaatsamenvatting die beter de veranderingen verklaard en wat een bepaalde indicator betekent. Onze aanbeveling is om deze informatie te gebruiken boven CCKP, mits niet beschikbaar of als men bekend vertrouwd is met het gebruik van klimaatmodelgegevens.

### **GCCA**

De Global Climate Change Alliance (GCCA) van de Europese Commissie heeft als doel om te functioneren als platform voor dialoog en het uitwisseling van ervaringen tussen EU en ontwikkelingslanden op het gebied van klimaatpolitiek en praktische aanpak om klimaatverandering te integreren in ontwikkelingspolitiek en budgettering. De GCCA geeft alleen een overzicht van de programma's en landen waarin geïnvesteerd is, inclusief een link naar de specifieke programma's.

### **IFPRI**

De website van het International Food Policy Research Institute (IFPRI) bevat een lijst van rapporten voor de meeste landen, waarvan sommige specifiek gericht zijn op klimaatverandering. In 2010 heeft IFPRI een rapport gepubliceerd met als titel "Strategies for Adapting to Climate Change in Rural Sub-Saharan Africa". Dit rapport verschaft informatie over de beschikbaarheid van klimaatgegevens, maar ook over klimaatverandering. De kwaliteit van dit rapport is niet beoordeeld.

### **GFDRR**

Global Facility for Disaster Reduction and Recovery (GFDRR) is een samenwerkingsverband tussen 41 landen en 8 internationale organisaties. De missie is gericht op het stroomlijnen van disaster risk reduction (DRR) en climate change adaptation (CCA) d.m.v. ondersteuning bij het ontwerpen van ontwikkelingsstrategieën per land. De website van GFDRR geeft links naar bestaande projecten voor de verschillende landen, meestal verwijzend naar programma's van de World Bank.

### **UNDP**

De United Nations Development Program (UNDP) geeft voor 52 ontwikkelingslanden, inclusief 11 relevant voor deze inventarisatie, aan welke klimaatverandering te verwachten is, vaak gemiddeld over het gehele land. Er zijn alleen algemene overzichten van een temperatuur- en neerslagverandering (gemiddelde en sommige extremen). Van toegevoegde waarde is dat deze website commentaar bevat over de kwaliteit van de klimaatgegevens. Het lijkt er sterk op dat dit rapport grote overeenkomsten vertoont met het AR4 rapport van IPCC.

### **UNISDR – Prevention web**

Prevention web is een project van de UN Office for Disaster Risk Reduction (UNISDR). De focus is sterk op het huidige risico met betrekking tot natuurrampen – beiden de menselijke als economische exposure en vulnerability worden belicht van overstromingen en link naar extreem weer. Er is een lijst beschikbaar met relevante documenten en publicaties, maar hoe nauwkeurig en compleet deze lijst is, is niet beoordeeld. Een korte blik op de lijst van natuurrampen in Nieuw-Zeeland leert dat deze lijst niet compleet is en niet over de juiste informatie beschikt: twee gerapporteerde rampen zijn niet juist, anderen zijn niet opgenomen in de lijst. Aangezien Prevention web onderdeel is van UN Disaster Risk Reduction (UNISDR), geeft de UNISDR zeer vergelijkbare informatie, welke meer gericht is op het huidige risico en niet toekomstige risico n.a.v. klimaatverandering.

### **ALM**

Het ALM-project (Adaptation Learning Mechanism) heeft als doel om te fungeren als centrale plaats voor documentatie en databases over welke adaptatiemaatregelen en operationele procedures efficiënt en werkbaar zijn. UNDP faciliteert ALM in nauwe samenwerking met de UN Framework Convention on Climate Change (UNFCCC), UNEP, de World Bank en gespecialiseerde UN agencies, inclusief de FAO. Op de website staan samenvattingen van potentiële adaptatiemaatregelen en kwetsbaarheden voor de verschillende landen m.b.t. klimaatverandering. Deze informatie komt uit rapporten vanuit verschillende bronnen, gesponsord door een van de bovenstaande partijen. Op het eerste gezicht lijkt de referentielijst geschikt. Ook staan er samenvattingen van recente projecten.

Country	WB-CCKP	WB-CRACP	GCCA	IFPRI	IFPRI 2010 report	GFDRR	UNDP	Prevention web	UNISDR	ALM	CDKN
Afghanistan	X	■	X	○	X	X	□	○ (17)	○	○	X
Bangladesh	■	■	○	○	X	○	□	○ (106)	○	○	■
Benin	X	■	○	○	X	○*	□	○ (7)	○	○	X
Burundi	X	■	X	○	○	○	X	○ (7)	○	○	X
Ethiopië	■	■	○	○	○	○	□	○ (44)	○	○	○
Ghana	■	■	X	○	X	○*	□	○ (14)	○	○	○
Indonesië	■	■	X	○	X	○*	□	○ (57)	○	X	○
Kenia	■	■	X	○	○	○	□	○ (36)	○	○	○
Mali	■	■	○	○	X	○*	□	○ (15)	○	○	X
Mozambique	■	■	○	○	X	○*	□	○ (37)	○	○	○
Rwanda	X	■	○	○	○	○	X	○ (6)	○	○	○
South Sudan	■	■	X	○	X	X	X	○ (1)	X	X	X
Uganda	X	■	○	○	○	○	□	○ (28)	○	○	X
Yemen	■	■	X	○	X	○	□	○ (11)	○	○	X
Palestine	X	(Israel)	X	X	X	X	X	○ (9)	○	X	X

Tabel 2 Lijst met namen en beschikbare informatie per bron.

Grijs (X): geen informatie,

blauw (■): klimaatverandering inclusief impact,

groen (□): klimaatverandering en extreem weer profiel, maar geen informatie m.b.t. impact,

oranje (○): links naar informatie, geen risicoprofiel of geen m.b.t. klimaatverandering en extreem weer –

een ster (\*) geeft aan dat er informatie kan zijn over disaster risk zonder link naar klimaatverandering. De nummers onder Prevention web geven aan hoeveel publicaties er per land beschikbaar zijn via deze bron

## APPENDIX 3

### ITC inventory of countries with risk profiles

#### Afghanistan

- ALM geeft beperkte informatie over klimaatverandering en de behoeften tot adaptatie, maar deze informatie lijkt zeer recent met referenties in 2010 en 2011
- CCKP geeft projecties voor mais, rijst en de 'beste' granen. Ook informatie m.b.t. overstromingen en droogte is beschikbaar, met de aantekening dat deze informatie niet geschikt is voor ontwerpstudies

#### *Andere informatiebronnen*

- Wildlife conservation society –

<http://programs.wcs.org/afghanistan/Challenges/ClimateChange.aspx>

Dit is een algemeen rapport over klimaatverandering in de region zonder referenties. Er is een discussie over wat WCS doet in antwoord op deze uitdagingen

- MDP – Master's in Development Practice – <https://sites.google.com/site/mdpafganistan/> bevat beperkte informatie over klimaatverandering, maar er staan links naar andere MDGs
- MSc thesis – Rural Community Vulnerability to Food Security Impacts of Climate Change in Afghanistan (2011). <http://uwspace.uwaterloo.ca/handle/10012/5965>
- Vanuit HTSPE, een internationaal consultancy bedrijf, heft een rapport geschreven over de socio-economic impacts of CC on Afghanistan. Helaas is er geen rapport of datum beschikbaar op de website. [http://www.htspe.com/climate\\_change.htm](http://www.htspe.com/climate_change.htm)

#### Bangladesh

- Prevention Web – Er zijn meer dan 100 documenten gepubliceerd met als onderwerp on Bangladesh en klimaatverandering, waarvan de meeste gepubliceerd zijn gedurende de afgelopen 3 jaren. De meeste van deze documenten zijn echter niet Bangladesh specifiek.
- CDKN – link to a risk, vulnerability en adaptatiemaatregelen in Bangladesh 2007/2008

#### *Andere informatiebronnen*

- Boek: <http://www.amazon.com/Climate-Change-Security-Bangladesh-Earthscan/dp/1849711305> van earth scan juni 2010
- Boek: Climate Change Adaptation Actions in Bangladesh (2013) – bevat een sessie over climate change impacts  
<http://www.springer.com/earth+sciences+and+geography/earth+system+sciences/book/978-4-431-54248-3>
- Bangladesh climate change resilience fund <http://bccrf-bd.org/Default.aspx>
- Rapport door Institute of Informatics and development, Bangladesh: Impact of Climate Change in Bangladesh: The role of public administration and government's integrity  
<http://www.eldis.org/go/display&type=Document&id=63811#.UYo-uMrQSVg>

### Benin

IFPRI heeft een overzicht over "West African Agriculture and Climate Change: Benin" (2012) dit rapport is niet beoordeeld naar kwaliteit

Prevention web – slechts 7 documenten in de periode 2008–2011 en allen zijn niet land-specifiek, maar een samenvatting geschreven voor regio.

### Burundi

Prevention web – slechts 7 documenten (2008–2011) en allemaal voor de region, niet land-specifiek.

### Ethiopië

- IFPRI heeft een overzichtsrapport "East African Agriculture and Climate Change: Ethiopia" (2012)
- Prevention web bevat +40 documenten op het gebied van klimaatsverandering en Ethiopië waarvan sommige zich specifiek richten op Ethiopië, en andere op de regio

### *Andere informatiebronnen*

- Rapport: Resources, risk and resilience: scarcity and climate change in Ethiopia (NYU)  
[http://cic.es.its.nyu.edu/sites/default/files/evans\\_security\\_ethiopia\\_2012.pdf](http://cic.es.its.nyu.edu/sites/default/files/evans_security_ethiopia_2012.pdf)
- Rapport: A climate change country assessment report for Ethiopia by Epsilon International R&D .  
[http://climatecapacity.org/files/RC\\_-\\_Assessment\\_Reports/Ethiopia\\_Country\\_Assessment\\_Report\\_ECSNCC.pdf](http://climatecapacity.org/files/RC_-_Assessment_Reports/Ethiopia_Country_Assessment_Report_ECSNCC.pdf)
- Climate investment fund heeft een webpagina:  
<https://www.climateinvestmentfunds.org/cifnet/country/ethiopia>

### Ghana

- IFPRI heeft een overzichtsrapport "West African Agriculture and Climate Change: Ghana" (2012). Verder zijn er vele rapporten beschikbaar. Er is ook een rapport op het gebied van klimaatverandering, landbouw en gewas productie in Ghana.

### *Andere informatiebronnen*

- Rapport op het gebied van climate change financing and aid effectiveness (2011) door OECD. Op het eerste gezicht lijken de schrijvers niet goed thuis in de fysische achtergrond van klimaatverandering. <http://www.oecd.org/dac/environment-development/48458430.pdf>
- Onderzoeksrapport: Republic of Ghana: the Challenge of Climate Change (2010)  
<http://books.google.nl/books?id=Wta9T0viso8C&pg=PA19&lpg=PA19&dq=%22ghana%22+climate+change+risk+profile&source=bl&ots=4RU1RSR-1-&sig=UWbOJRbMjCBme1ynnAWHLHUCjr8&hl=en&sa=X&ei=zEGKUbO1BO6Y0AWw24GwCw&ved=0CGIQ6AEwCTgK#v=onepage&q=%22ghana%22%20climate%20change%20risk%20profile&f=false>

### Indonesia

#### *Andere informatiebronnen*

- Indonesia Climate change center : <http://www.iccc-network.net/en/about-us/what-we-do>
- (Grijs) rapport on impact of climate change on households: [http://www.pep-net.org/fileadmin/medias/pdf/CBMS\\_country\\_proj\\_profiles/Philippines/Special\\_initiatives/EEPSEA/1114\\_Indonesia\\_Climate\\_change\\_Report\\_-REVfinal\\_22\\_May\\_2012\\_.pdf](http://www.pep-net.org/fileadmin/medias/pdf/CBMS_country_proj_profiles/Philippines/Special_initiatives/EEPSEA/1114_Indonesia_Climate_change_Report_-REVfinal_22_May_2012_.pdf)

- Rapport over klimaatverandering issues en mitigatiemaatregelen:  
[https://crawford.anu.edu.au/accpforum/pdf/ppp/11\\_Yusuf.pdf](https://crawford.anu.edu.au/accpforum/pdf/ppp/11_Yusuf.pdf)
- Doctoral thesis: Welfare impacts of extreme weather events and palm oil production expansion in Indonesia: <http://sro.sussex.ac.uk/40054/>

### Kenia

- IFPRI heeft het overzichtsrapport “East African Agriculture and Climate Change: Kenya” (2012)
- Van de ALM webpagina een 2002 rapport op het gebied van sustainable development, emissions, climate change impacts, vulnerability assessment, adaptation and mitigation as well as research, education and summary of projects. Benadrukt moet worden dat dit rapport al 10 jaar oud is, dus misschien achterhaald

### *Andere informatiebronnen*

- WHO Climate change adaptation to protect human health. De focus is op malaria, maar maakt ook melding van andere rampen zoals overstromingen. Tijdfraam is 2010–2014.  
<http://www.who.int/globalchange/projects/adaptation/en/index6.html>
- Rapport van UNDP – Climate Risks, vulnerability and governance in Kenya: A review (2012). Dit lijkt of betere kwaliteit dan andere gevonden rapporten.  
[http://www.iisd.org/pdf/2013/climate\\_risks\\_kenya.pdf](http://www.iisd.org/pdf/2013/climate_risks_kenya.pdf)
- Rapport: Kenya Climate change briefing (2010), Cranfield university  
<http://www.wsup.com/sharing/documents/Kenyaclimatechangesummary2010.pdf>
- Vroege studie (1992) Climate change and vulnerable places: Global food security and country studies in Zimbabwe, Kenya, Senegal and Chile <http://www.ciesin.org/docs/004-042/004-042.html>

### Mali

### *Andere informatiebronnen*

- Rapport door World Resources: Increasing food security with agrometeorological information: Mali’s National Meteorological Service helps farmers manage climate risk  
[http://www.worldresourcesreport.org/files/wrr/wrr\\_case\\_study\\_increasing\\_food\\_security\\_mali.pdf](http://www.worldresourcesreport.org/files/wrr/wrr_case_study_increasing_food_security_mali.pdf)
- FAO rapport (2012) Potential impacts of climate change on food security in Mali  
<http://www.fao.org/docrep/016/i2856e/i2856e.pdf>
- Rapport (2008) Climate change and poor management of natural resources as binding constraint to growth in Mali – an annex to the Integrated Economic Analysis  
<http://sidaenvironmenthelpdesk.se/wordpress/wp-content/uploads/2011/06/Mali-environment-and-climate-Annex-to-IEA-Oct-20081.pdf>

### Mozambique

- CRACP – Hydrologische modellering voor toekomstige projecties van overstromingen
- IFPRI heeft een overzichtsrapport “Southern African Agriculture and Climate Change: Mozambique” (2012)

### *Andere informatiebronnen*

- Presentatie over climate change impacts and disaster. Risk reduction in Mozambique (2012 by INGC) [http://www.sarva.org.za/sadc/download/moz2012\\_10.pdf](http://www.sarva.org.za/sadc/download/moz2012_10.pdf)



- Rapport : Environment and Climate Change Policy Brief – Mozambique (Sida 2011). Hier staat weinig in over de fysieke kant van klimaatverandering  
[http://sidaenvironmenthelpdesk.se/wordpress/wp-content/uploads/2012/01/Mozambique-Env-and-CC-Policy-Brief\\_20111.pdf](http://sidaenvironmenthelpdesk.se/wordpress/wp-content/uploads/2012/01/Mozambique-Env-and-CC-Policy-Brief_20111.pdf)

#### Rwanda

- IFPRI heeft een overzichtsrapport “East African Agriculture and Climate Change: Rwanda” (2012)

#### *Andere informatiebronnen*

- Rapport: National adaptation programs of action to climate change – Rwanda (2006)  
<http://unfccc.int/resource/docs/napa/rwa01e.pdf>
- Rapport (Rwanda Environment Management Authority, 2010) Assessment of operational framework related to climate change in Rwanda  
[http://www.rema.gov.rw/rema\\_doc/Climate%20change/Final\\_Report\\_CC\\_Dpt.pdf](http://www.rema.gov.rw/rema_doc/Climate%20change/Final_Report_CC_Dpt.pdf)
- Economics of Climate Change in Rwanda (Stockholm Environment Institute, 2009).  
<http://www.rema.gov.rw/ccr/Final%20report.pdf>
- Rapport over Climate change and natural disasters. Het ziet eruit alsof dit ook van REMA komt, zoals de eerste 2 rapporten <http://www.rema.gov.rw/soe/chap9.php>

#### Zuid Sudan

- CCKP – toekomst klimaatprojecties alleen voor de jaarlijkse gemiddelde temperatuur en neerslag (geen extremen)
- IFPRI heeft een overzichtsrapportage “East African Agriculture and Climate Change: South Sudan” (2012)
- Prevention Web – geen disaster statistieken. Zeer beperkte informatieve voor dit land beschikbaar

#### *Andere informatiebronnen*

- Een paar alineas in een Oxfam rapport: <http://www.oxfam.ca/sites/default/files/imce/country-profile-south-sudan.pdf>
- Korte rapportage (2012) over hoe om te gaan met klimaatverandering in een conflictgebied  
<http://www.ids.ac.uk/files/dmfile/LHcasestudy14-Sudan.pdf>

#### Uganda

- IFPRI heeft een overzichtsrapportage “East African Agriculture and Climate Change: Uganda” (2012)

#### *Andere informatiebronnen*

- Rapport Climate change vulnerability and adaptation preparedness in Uganda (2010 Heinrich Boll Stiftung)  
[http://www.ke.boell.org/downloads/Uganda\\_Climate\\_Change\\_Adaptation\\_Preparedness.pdf](http://www.ke.boell.org/downloads/Uganda_Climate_Change_Adaptation_Preparedness.pdf)
- Boek: Hidden Heat – Communicating climate change in Uganda: Challenges and Opportunities (2011) [http://psych.cf.ac.uk/understandingrisk/docs/hidden\\_heat.pdf](http://psych.cf.ac.uk/understandingrisk/docs/hidden_heat.pdf)
- Rapport: Climate change in Uganda: Understanding the implications and appraising the response (2008 LTS)  
[http://reliefweb.int/sites/reliefweb.int/files/resources/7F1BF4A7CF37F6A54925756F0016ED29-Full\\_Report.pdf](http://reliefweb.int/sites/reliefweb.int/files/resources/7F1BF4A7CF37F6A54925756F0016ED29-Full_Report.pdf)

- Iets wat lijkt op een MSc thesis: Climate change, weather variability and food consumption: A multidisciplinary study of rural Uganda (geen datum, maar na 2010)  
[https://editorialexpress.com/cgi-bin/conference/download.cgi?db\\_name=CSAE2013&paper\\_id=457](https://editorialexpress.com/cgi-bin/conference/download.cgi?db_name=CSAE2013&paper_id=457)

### Yemen

- IFRPI heeft een rapportage “climate change and floods in Yemen” (2011).

### *Andere informatiebronnen*

- Rapport en proceedings (vergadering van de PPCR Sub- Committee, 2011) Strategic program for climate resilience for Yemen  
<http://www.climateinvestmentfunds.org/cif/sites/climateinvestmentfunds.org/files/PPCR%207%20Yemen%20SPCR.pdf>
- Rapport (UNSIDR, 2012) Disaster Risk – Poverty Trends in Jordan, Syria, Yemen: Key findings and policy recommendations  
[http://www.unisdr.org/files/27853\\_arabriskpovertypolicynotejuly2012.pdf](http://www.unisdr.org/files/27853_arabriskpovertypolicynotejuly2012.pdf)
- Rapport: Yemen country report (ADRC, 2012) Includes climate change. Not sure about quality  
[http://www.adrc.asia/countryreport/YEM/2012/YEM\\_CR2012A.pdf](http://www.adrc.asia/countryreport/YEM/2012/YEM_CR2012A.pdf)

### Palestijnse gebieden

### *Andere informatiebronnen*

- Presentatie: Expected impact of climate change on population and livelihood in arid and semiarid areas: case studies from Palestine. [http://www.feem-project.net/xerochore/files/S3.3\\_N.Carmi.pdf](http://www.feem-project.net/xerochore/files/S3.3_N.Carmi.pdf) van de Xerochore website
- Mason, Michael, Zeitoun, Mark and Mimi, Ziad (2012) Compounding vulnerability: impacts of climate change on Palestinians in Gaza and the West Bank. Journal of Palestine studies, 41 (3). pp. 1–16. ISSN 1533–8614 <http://www.palestine-studies.org/journals.aspx?id=11374&jid=1&href=abstract>
- Rapport: Climate Change Adaptation Strategy and Programme of Action for the Palestinian Authority (UNDP, geen datum)  
<http://www.undp.ps/en/newsroom/publications/pdf/other/climatechange.pdf>

## APPENDIX 4

### Websites with information on Natural Disasters

[Em-Dat – http://www.emdat.be/](http://www.emdat.be/)

This International Disaster Database is created by the Centre for Research on the Epidemiology on Disasters and was initially supported by the World Health Organisation and the Belgian Government. It aims to rationalize decision making for disaster preparedness and vulnerability assessment. The website is very well known and it ranks the largest disasters per country, giving a clear overview of the main events. The data is also transformed into maps and graphs and based on number of people killed and affected in the disaster as well as economic damage. It does not provide information about the disasters ranked about from disaster type and year.

[GLIDENumber – http://www.glidenumbers.net/glide/public/search/search.jsp](http://www.glidenumbers.net/glide/public/search/search.jsp)

The Asian Disaster Reduction Centre proposed to introduce a common unique ID code for disasters. Other centers, NGOs and research institutes joined to launch this idea which became GLIDE. This database is a very simple to use application to find information about disasters (technical and natural) in different countries. It allows to search per continent, country and event, and with keywords and dates. Information is often quite specific giving location and date of an event as well as figures. The completeness of information differs per country and hazard.

[PreventionWeb – http://www.preventionweb.net/](http://www.preventionweb.net/)

PreventionWeb is provided by United Nations International Strategy for Disaster Reduction. In support of the Hyogo Framework for Action (HFA) it aims to help build resilience to nations and communities to disasters. It is a very intuitive website and is set up nicely. It provides very clear country specific information on disasters and government policies (especially regarding the progress of the HFA). It is also useful for the general public as it gives clear overviews and graphical representations. The indicators used in the statistics are number affected, number killed and economic damage. An interesting indicator is exposure, which shows the number of people living in an area that is at risk. A disadvantage is that there is no detailed information about specific hazards.

[ReliefWeb – http://reliefweb.int/](http://reliefweb.int/)

This website is well known in the sector and provides good, clear and detailed information. ReliefWeb scans other websites of NGOs, governments, institutions, policy documents, media, etc. and puts relevant information on the website. They also create useful infographics. What is good about this service is the detailed information of disasters. It does not give overviews of general hazard risk per country. The information is used by the humanitarian field and can therefore be less useful for laypersons.

[Global Risk Data Platform – http://preview.grid.unep.ch/index.php?preview=home&lang=eng](http://preview.grid.unep.ch/index.php?preview=home&lang=eng)

The application is a new generation of PREVIEW initiated in 1999 by UNEP/GRID–Geneva. The data is taken from the Global Assessment Report on Disaster Risk Reduction 2009 and 2011 and adapted to make it more visual by a large group of experts. The Platform allows for the visualization of natural hazards, exposure and risk on a world map. It is very interactive, allowing to zoom in and apply different layers, such as population density. It is a large program and requires either some patience or a strong computer, but gives beautiful geospatial information on hazards.

[Humanitarian Early Warning Service \(HEWSweb\) – http://www.hewsweb.org/hp/](http://www.hewsweb.org/hp/)

The IASC Humanitarian Early Warning Service (HEWSweb) is an inter–agency partnership project aimed at creating a common platform for humanitarian early warnings and forecasts for natural hazards. It is developed and maintained by the WFP. The application allows navigation between different hazards in the world and provides real–time early warning with additional information on location and nearby population.