

# GLOBAL CLIMATE RISK INDEX 2012

WHO SUFFERS MOST FROM EXTREME WEATHER  
EVENTS? WEATHER-RELATED LOSS EVENTS IN 2010  
AND 1991 TO 2010

Sven Harmeling



## Summary

As in previous years, the Global Climate Risk Index 2012 analyses to what extent countries have been affected by the impacts of weather-related loss events (storms, floods, heat waves etc.). The most recent available data from 2010 as well as for the period 1991-2010 were taken into account.

Most affected countries in 2010 were Pakistan, Guatemala, Colombia and Russia. For the period 1991 to 2010, Bangladesh, Myanmar and Honduras rank highest.

This year's analysis underlines that less developed countries are generally more affected than industrialised countries, according to the Climate Risk Index. With regard to future climate change, the Climate Risk Index can serve as a warning signal indicating past vulnerability which may further increase in regions where extreme events will become more frequent or more severe through climate change. While some vulnerable developing countries are frequently hit by extreme events, there are also some where such disasters are a rarity.

In Cancún at COP16 an Adaptation Framework was adopted in order to secure an institutional and financial support for vulnerable countries. The climate summit in Durban (COP17) will have to make substantial steps in order to further put into action the initiated processes and to scale-up adaptation.

## Imprint

**Author:** Sven Harmeling, with support from Boris Schinke, Charlotte Haberstroh, Sönke Kreft

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Office Bonn  
Dr. Werner-Schuster-Haus  
Kaiserstr. 201  
D-53113 Bonn  
Phone +49 (0) 228 60492-0, Fax -19  
Internet: <http://www.germanwatch.org>  
E-Mail: [info@germanwatch.org](mailto:info@germanwatch.org)

Office Berlin  
Schiffbauerdamm 15  
D-10117 Berlin  
Phone +49 (0) 30 2888 356-0

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Comments welcome. For correspondence with the author: [harmeling@germanwatch.org](mailto:harmeling@germanwatch.org)

## Contents

How to read the Global Climate Risk Index.....	3
Key messages.....	4
1 Key results of the Global Climate Risk Index 2012.....	5
2 Impacts on Africa.....	10
3 Operationalising the Loss and Damage Work Programme in Durban .....	14
4 Methodological Remarks.....	16
Annexes.....	19

## How to read the Global Climate Risk Index

The Germanwatch Global Climate Risk Index is an analysis based on the most reliable available data on the impacts of extreme weather events and associated socio-economic data. The Germanwatch Climate Risk Index 2012 is the 7<sup>th</sup> edition of the annual analysis. It represents one important piece in the overall, more comprehensive puzzle of climate-related impacts and associated vulnerabilities: for example, it does not take into account other important aspects such as sea-level rise, glacier melting or more acid and warmer seas. It is based on past data and should not be used for a linear projection of future climate impacts. Also, it is important to note that a single extreme event can - because of methodological reasons - not be traced back solely to anthropogenic climate change. Nevertheless, climate change is an increasingly important factor for changing the odds of occurrence and intensity of these events.

The Climate Risk Index thus indicates a level of exposure and vulnerability to extreme events which countries should see as a warning signal to prepare for more frequent or more severe events in the future. The limitations to the data availability, including the socio-economic data, means that the analysis does not encompass some very small countries such as certain small island states, since in particular in a longer-term comparison, sufficiently sound data is not always available. Furthermore the data only reflects the *direct* impacts (direct losses and fatalities) of extreme weather events, while heat waves for example often lead to much stronger *indirect* impacts (e.g. through droughts and food scarcity) which is often the case in African countries. Also, it does not include the total number of affected people (in addition to the fatal casualties), since the comparability of such data is very limited.

## Key messages

- According to the Germanwatch Global Climate Risk Index, Bangladesh, Myanmar and Honduras were the countries most affected by extreme weather events from 1991 to 2010;
- All of the ten most affected countries (1991-2010) were developing countries in the low-income or lower-middle income country group;
- In total, more than 710,000 people died as a direct consequence of more than 14,000 extreme weather events, and losses of more than 2.3 trillion USD (in PPP) occurred from 1991 to 2010 (USD 1.5 trillion overall losses in original values);
- In 2010, the ranking of the most affected countries is led by Pakistan, Guatemala, Colombia, Russia and Honduras;
- In the case of the Russian heatwave some scientists see a high probability that without climate change this event would not have occurred;
- Loss and damage from anthropogenic climate change is expected to further increase; therefore, the current lack of ambition in mitigation putting the world on a path of 4 to 5°C increase in average temperature would result in a large-scale experiment unprecedented in the history of mankind;
- Many developing countries are already taking action to prepare for climate-related disasters and to promote as well as implement adaptation. However, adequate financial and institutional support provided by developed countries is required to further increase disaster preparedness and resilience of poor countries. Operationalising the Green Climate Fund at COP17 in Durban could be one important step to build up long-term support.
- Through the adoption of the Cancún Adaptation Framework (CAF) at COP16, an important step was made by Parties to the UNFCCC for a more ambitious and coherent approach to adaptation. The CAF also contained the decision on a work programme on loss and damage from the adverse impacts of climate change. For COP17 in Durban, it is crucial to define the concrete next steps with a view to reaching a more comprehensive and ambitious decision at COP18.

# 1 Key results of the Global Climate Risk Index 2012

People all over the world have to face the reality of climate variability. More than 710,000 people died as a direct consequence of more than 14,000 extreme weather events, and losses of more than USD 2.3 trillion (in PPP) occurred from 1991 to 2010 globally.

The recently published Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX) prepared by the Intergovernmental Panel on Climate Change has highlighted the risks of extreme events as well as options to prepare for these. It also made clear that extreme events and its impacts happen in a complex “interaction of climatic, environmental, and human factors that can lead to impacts and disasters”.<sup>1</sup>

The science behind extreme events and the role of climate change as a cause remains complex, but some key messages from the IPCC report include the following<sup>2</sup>:

- A changing climate leads to changes in the frequency, intensity, spatial extent, duration, and timing of extreme weather and climate events, and can result in unprecedented extreme weather and climate events;
- It is likely that the frequency of heavy precipitation or the proportion of total rainfall from heavy falls will increase in the 21st century over many areas of the globe;
- With high confidence, exposure and vulnerability are dynamic, varying across temporal and spatial scales, and depend on economic, social, geographic, demographic, cultural, institutional, governance, and environmental factors;
- Extreme events will have greater impacts on sectors with closer links to climate, such as water, agriculture and food security, forestry, health, and tourism.

The **Global Climate Risk Index (CRI) developed by Germanwatch** analyses the quantified impacts of extreme weather events<sup>3</sup> - both in terms of fatalities as well as economic losses that occurred - based on data from Munich Re NatCatSERVICE which is world wide one of the most reliable and complete data bases on this matter. The CRI looks both at absolute and relative impacts, and results in an average ranking of countries in four indicators, with a stronger weighting of the relative indicators. The countries ranking highest are the ones most impacted and should see the CRI as a “warning signal” that they are at risk either from frequent events or rare, but extraordinary catastrophes.

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<sup>1</sup> IPCC, 2011: IPCC SREX Summary for Policymakers. [www.ipcc.ch](http://www.ipcc.ch)

<sup>2</sup> See IPCC, 2011

<sup>3</sup> Meteorological events such as tropical storms, winter storms, severe weather, hail, tornado, local storms; hydrological events such as storm surges, river floods, flash floods, mass movement (landslide); climatological events such as freeze, wildland fires, droughts

The Climate Risk Index does not provide an all-encompassing analysis of the risks from anthropogenic climate change to countries, but should be seen as one analysis informing countries' exposure and vulnerability to climate-related risks along with other analyses<sup>4</sup>, based on the most reliable quantified data. It is of course influenced by the current and past climate variability and to the extent that climate change has already left its footprint in the climate variability of the last 20 years also on climate change. However, tracing and identifying the climate change footprint is extremely complex and cannot be dealt with here in more detail.

### **Countries most affected in the period of 1991-2010**

**Bangladesh, Myanmar and Honduras** have been identified to be the most affected in this 20-year period.<sup>5</sup> They are followed by **Nicaragua, Haiti, Viet Nam and the Dominican Republic**. Table 1 shows the ten most affected countries (Down 10) of the last two decades, with their average, weighted ranking (CRI score) and the specific results in the four indicators analysed. There are only slight changes compared to the analyses presented in the CRI 2011 which looked at the period from 1990 to 2009.

**Table 1: The Long-Term Climate Risk Index (CRI): Results (annual averages) in specific indicators in the 10 countries most affected in 1991 to 2010.**

<b>CRI 1991-2010 (1990-2009)</b>	<b>Country</b>	<b>CRI score</b>	<b>Death toll</b>	<b>Deaths per 100,000 inhabitants</b>	<b>Total losses in million US\$ PPP</b>	<b>Losses per unit GDP in %</b>	<b>Number of Events (total 1991-2010)</b>
<b>1 (1)</b>	Bangladesh	8.17	7,814	5.51	2,091	1.56	251
<b>2 (2)</b>	Myanmar	10.50	7,130	14.06	659	1.68	33
<b>3 (3)</b>	Honduras	11.67	327	5.05	662	2.93	56
<b>4 (4)</b>	Nicaragua	18.00	159	2.83	212	1.90	43
<b>5 (6)</b>	Haiti	21.17	340	3.95	155	1.12	51
<b>6 (5)</b>	Viet Nam	21.50	445	0.57	1,809	1.19	40
<b>7 (8)</b>	Dominican Republic	30.50	211	2.51	181	0.37	44
<b>8 (37)</b>	Pakistan	30.67	558	0.40	1,834	0.66	144
<b>9 (-)</b>	Korea, DPR	30.83	74	0.33	1,172	3.61	33
<b>10 (7)</b>	Philippines	31.83	801	1.03	660	0.30	270

Among the ten countries most affected, there is not one developed or Annex-I country, among the first 20 there is only one developed country (Russia only as a consequence of the extreme heat wave in 2010). Particularly in relative terms, poorer developing countries are hit much harder. These results underscore the particular vulnerability of poor

<sup>4</sup> See e.g. analyses of Columbia University: <http://ciesin.columbia.edu/data/climate/>, Maplecroft's Climate Change Vulnerability Index: <http://www.maplecroft.com/about/news/ccvi.html>

<sup>5</sup> The full rankings can be found in the Annexes.

countries to climatic risks, despite the fact that the absolute monetary damages are much higher in richer countries. In addition, one has to acknowledge that affected developing countries are among the poorer developing countries, least responsible for causing climate change.

### **Countries most affected in 2010**

**Pakistan, Guatemala and Colombia** have been identified to be the most affected countries last year.<sup>6</sup> They are followed by **Russia, Honduras and Oman**. Table 2 shows the ten most affected countries (Down 10), with their average, weighted ranking (CRI score) and the specific results in the four indicators analysed.

**Table 2: The Climate Risk Index for 2010: the 10 most affected countries**

<b>Ranking 2010 (2009)</b>	<b>Country</b>	<b>CRI score</b>	<b>Death toll</b>	<b>Deaths per 100,000 inhabitants</b>	<b>Absolute losses (in million US\$ PPP)</b>	<b>Losses per unit GDP in %</b>	<b>Human Development Index<sup>7</sup></b>
<b>1 (68)</b>	Pakistan	3.50	1,891	1.10	25,316	5.42	145
<b>2 (53)</b>	Guatemala	6.33	229	1.59	1,969	2.80	131
<b>3 (100)</b>	Colombia	8.00	320	0.70	7,544	1.73	87
<b>4 (75)</b>	Russia	11.00	56,165	39.30	5,537	0.25	66
<b>5 (65)</b>	Honduras	14.67	139	1.73	220	0.65	121
<b>6 (88)</b>	Oman	17.00	24	0.81	1,314	1.73	89
<b>7 (14)</b>	Poland	17.83	151	0.40	4,745	0.66	39
<b>8 (93)</b>	Portugal	19.67	47	0.44	1,749	0.71	41
<b>9 (23)</b>	China	23.50	2,889	0.22	33,395	0.33	101
<b>10 (38)</b>	Tajikistan	24.17	27	0.35	262	1.77	127

Honduras (primarily hurricanes), China (various extreme events, but in particular floodings) and also Guatemala (hurricanes) have appeared several times among the most affected countries. Extraordinary events occurred in Pakistan (flooding), Colombia (flooding), Russia (heat wave) and Oman (flooding) which caused the high ranking of these countries. Also the appearance of Poland (flooding) and Portugal (flooding) is quite unusual.

Although Pakistan had to get used to extreme weather events in the last years, in 2010 it was hit by the worst floods of its history. During the monsoon season, Pakistan experienced huge floods in 84 of 121 districts killing more than 1700 people.

In July 2010 a heat wave in Russia caused massive damage through forest and peat fires. It was the hottest month ever recorded with meteorological data in Moscow. The heat-

<sup>6</sup> The full rankings can be found in the Annexes.

<sup>7</sup> UNDP, 2011: Human Development Report, <http://hdr.undp.org/en/statistics/hdi/>

wave caused more than 55,000 fatalities, according to the statistics. The Russian heat-wave has been one of the few extreme events where researchers have identified a strong indication that climate change has been a key driver of its appearance:

“The Moscow heat wave last year was, with high probability, the result of climate change – contrary to what some have assumed. With a likelihood of 80 percent, it was not natural short-term climatic variability but the long-term warming trend that caused the temperature record in the region surrounding the Russian capital in July 2010”.<sup>8</sup>

### **Exceptional catastrophes or continuous threats?**

The Global Climate Risk Index for 1991 to 2010 is based on average figures of twenty years. However, there are two groups of countries among the Down 10: those who are continuously affected by extreme events, and those that only rank high because of exceptional catastrophes. Two examples for the latter case are Myanmar, where more than 95% of the damages and fatalities occurred in 2008 through cyclone Nargis, and Honduras, where more than 80% in both categories were caused through Hurricane Mitch in 1998.

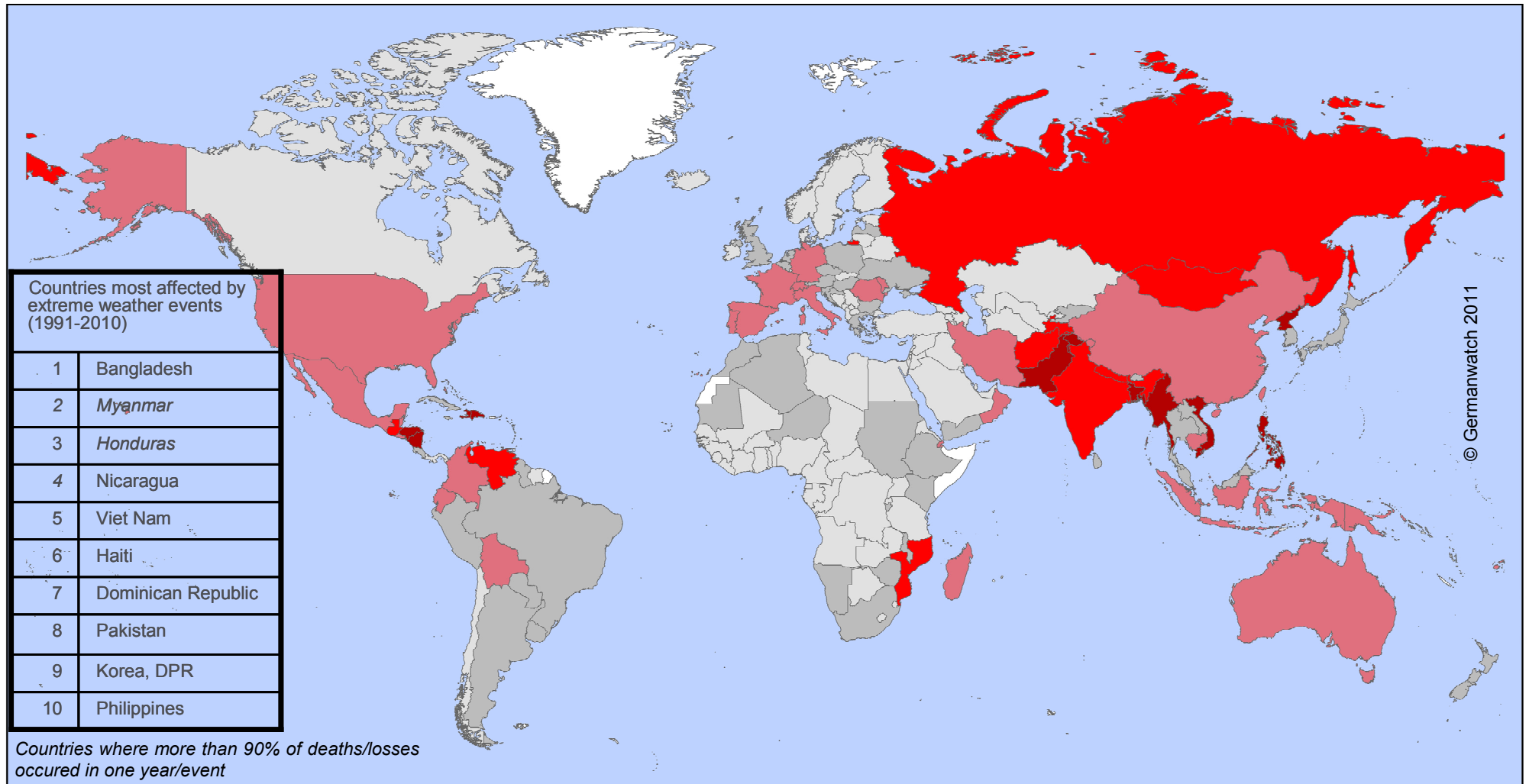
Similarly, the appearance of some European countries among the first 30 countries is almost exclusively because of the extraordinary number of fatalities due to the 2003 heat wave, in which more than 70,000 people died across Europe. Although some of them are often hit by extreme events, usually the losses and fatalities are relatively minor compared to the countries' population and economic power. The most recent example is Russia.

While in Bangladesh more than 80% of the deaths occurred in 1991, the country is continuously hit by extreme events and the fact that no further peak catastrophe caused so much hardship (140,000 people died in that of 1991) can be seen as a partial proof that it is possible to better prepare for climate risks and prevent larger-scale impacts from disasters.

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<sup>8</sup> See [www.pik-potsdam.de](http://www.pik-potsdam.de) and Rahmstorf, S., Coumou, D. (2011): Increase of extreme events in a warming world. *Proceedings of the National Academy of Sciences* (early edition), [doi:10.1073/pnas.1101766108]





## Climate Risk Index: Ranking 1991 – 2010



**Figure 1: World Map of the Global Climate Risk Index 1991-2010**

Source: Germanwatch and Munich Re NatCatSERVICE

## 2 Impacts on Africa

Durban as the host of this year's COP is situated in a world region which is seen as particularly vulnerable to the adverse impacts of climate change. The countries of Africa use to feature relatively low on the Climate Risk Index. In the African regions, indirect impacts like food scarcity as consequence of droughts often cause the most severe consequences which cannot be considered with sufficient reliability in the data that provide the basis for the Climate Risk Index.

Table 3 lists the 10 countries of the continent which rank highest in the Climate Risk Index for the period from 1991-2010, Table 4 only refers to 2010. The figures for other countries of the region can be found in the Annexes.

However, this does not mean that Africa is not affected. Databases also try to assess the number of people affected, using different categories such as affected, homeless or injured.<sup>9</sup> EM-DAT counts almost 37 million people affected in 2010 (see Table 5). However, the problem is that these figures are much less than reliable and more difficult to determine than the number of deaths. Using them in a comparison of more than 150 countries worldwide, as would be necessary in the case of the Climate Risk Index, does not seem justified from a scientific and methodological point of view.

**Table 3: African countries in the CRI 1991-2010**

Ranking CRI	Country	CRI score	Death toll	Deaths per 100,000 inhabitants	Absolute losses (in million US\$ PPP)	Losses per unit GDP in %	Number of events	Human Development Index <sup>10</sup>
19	<b>Mozambique</b>	38.17	1,745	0.49	95.97	0.92	50	184
28	<b>Madagascar</b>	43.83	1,614	0.49	75.10	0.55	41	151
41	<b>Djibouti</b>	53.00	175	1.31	9.98	0.73	9	165
60	<b>Malawi</b>	62.50	596	0.24	34.93	0.46	26	171
74	<b>Kenya</b>	77.17	984	0.16	66.86	0.15	62	143
79	<b>Namibia</b>	81.50	160	0.44	10.96	0.12	28	120
79	<b>Zimbabwe</b>	81.50	185	0.08	22.35	0.42	28	173
83	<b>South Africa</b>	82.67	1,216	0.14	242.20	0.07	307	123
85	<b>Sudan</b>	83.50	846	0.13	81.26	0.11	37	169
88	<b>Morocco</b>	85.17	546	0.10	112.33	0.12	41	130

<sup>9</sup> See also [www.emdat.be](http://www.emdat.be)

<sup>10</sup> UNDP, 2011: Human Development Report, <http://hdr.undp.org/en/statistics/hdi/>

This picture does not change significantly if other data bases are referred to. For example, also EM-DAT managed by the Centre for Research on Epidemiological Diseases (CRED), counts less than 1,000 fatalities from storms, floods, droughts and wildfires in the whole of Africa.<sup>11</sup>

**Table 4: African countries in the CRI 2010**

Ranking CRI	Country	CRI score	Death toll	Deaths per 100,000 inhabitants	Absolute losses (in million US\$ PPP)	Losses per unit GDP in %	Number of events	Human Development Index <sup>12</sup>
14	Benin	26.50	53	0.55	63.66	0.46	1	167
27	Madagascar	35.83	86	0.40	22.61	0.11	2	151
29	Uganda	37.83	307	0.90	6.71	0.02	8	161
33	Ghana	41.00	109	0.46	20.08	0.03	2	135
34	Angola	41.50	156	0.82	7.30	0.01	3	148
37	Mauritania	43.50	21	0.66	3.70	0.06	1	159
42	Chad	49.50	27	0.26	8.14	0.04	3	183
43	Kenya	49.67	93	0.23	14.53	0.02	3	143
47	Morocco	54.33	43	0.14	27.01	0.02	4	130
51	Togo	58.00	21	0.30	0.94	0.02	1	162

Table 5 shows the numbers of affected people for African countries for 2010 from the different types of climate-related disasters.

**Table 5: Different types of climate-related disasters in African countries and number of affected people**

Country	Drought	Flood	Storm	Wildfire	Total
Angola	0	189,781	0	0	189,781
Benin	0	831,000	0	0	831,000
Burkina Faso	0	133,362	0	0	133,362
Burundi	180,000	1,990	1,500	0	183,490
Cameroon	0	3,095	0	0	3,095
Central African Rep	0	1,585	0	0	1,585
Chad	2,400,000	144,579	0	0	2,544,579
Cote d'Ivoire	0	6,425	0	0	6,425
Djibouti	165,264	0	0	0	165,264
Egypt	0	3,500	40	0	3,540
Ethiopia	6,200,000	80,700	0	0	6,280,700
Gabon	0	0	1,765	0	1,765
Gambia	0	38,961	0	0	38,961
Ghana	0	17,174	0	0	17,174

<sup>11</sup> Query made in EM-DAT database on 17 November 2011, see [www.emdat.be](http://www.emdat.be)

<sup>12</sup> UNDP, 2011: Human Development Report, <http://hdr.undp.org/en/statistics/hdi/>

Country	Drought	Flood	Storm	Wildfire	Total
Guinea	0	48,026	0	0	48,026
Guinea Bis-sau	0	56,792	0	0	56,792
Kenya	3,754,585	211,164	0	0	3,965,749
Liberia		15,486	0	0	15,486
Madagascar	720,000	0	192,132	0	912,132
Malawi	0	21,290	0	0	21,290
Mali	600,000	8,750	0	0	632,000
Mauritania	300,000	8,750	0	0	308,750
Morocco	0	77,009	0	0	77,009
Mozambique	460,000	17,000	0	0	477,000
Namibia		110,000	0	0	110,000
Niger	7,900,000	233,226	0	0	8,133,226
Nigeria		1,500,200	0	0	1,500,200
Rwanda	0	0	0	0	0
Senegal	0	102,516	0	0	102,516
Sierra Leone	0	234	0	0	234
Somalia	4,000,000	16,200	0	0	4,016,200
South Africa	0	0	6,000	0	6,000
Sudan	4,300,000	26,362	0	0	4,326,362
Togo	111,550	0	0	0	111,550
Uganda	0	0	0	0	0
Zaire/Congo Dem Rep	0	70,500	0	2,770	73,270
Zambia	0	1,200	0		1,200
Zimbabwe	1,680,000	820	0		1,680,820
<b>Total</b>	<b>32,659,849</b>	<b>4,112,477</b>	<b>201,437</b>	<b>2,770</b>	<b>36,976,533</b>

Source: own query on "EM-DAT: The OFDA/CRED International Disaster Database

Figures such as nearly 1 in 30 Africans affected by drought in 2010 only, but also considerable flooding exposures and vulnerabilities highlight the need for African countries to embark much more expeditiously on a risk reduction paradigm. Adding climate impacts, such as desertification and increased variability of extremes, means that adaptation must be of top priority for African countries. Since response capacity is the lowest in African countries, and African countries also have contributed almost nothing to the climate crisis, the support of this endeavour becomes a priority, yet obligation for the international community and developed countries in particular.

One interesting approach, where African countries develop their own response, is the African Risk Capacity Project. This project by the African Union would be a pan-African risk pool that provides quick contingency funds to their member states in case of severe droughts. This in return could reduce significantly the delay of providing help when a disaster strikes. The ability to provide funds quickly might help to prevent disasters turning into humanitarian crises at a later point. Right now the African Risk Capacity project is in its feasibility, design and scoping stage, but if it turns out viable, it would be a great showcase for African leadership in the fight against climate and weather impacts. At a

later stage it might also cover other weather-linked catastrophes such as flooding. For further information on the African Risk Capacity project, visit [www.africanriskcapacity.org](http://www.africanriskcapacity.org). For further information on climate-related insurance solutions including proposals in the UNFCCC context visit [www.climate-insurance.org](http://www.climate-insurance.org) hosted by the Munich Climate Insurance Initiative (MCII).

### 3 Operationalising the Loss and Damage Work Programme in Durban

At the UN Climate Summit in Cancún in 2010, Parties to the UNFCCC agreed to establish a work programme on loss and damage from climate change impacts.<sup>13</sup>

What is important to take into account is that addressing loss and damage is crucial because it recognizes that

A) the next 20 years or so of climate change impacts are locked in because of the emissions already accumulated in the atmosphere and their associated effects on global warming. So we have to look at the implementation of concrete actions to address and reduce loss and damage from extreme weather-related risks today;

B) mitigation of emissions remains a critical longer-term goal to try and buffer or reduce the potentially significant systemic shifts that may be associated with climate change issues like sea-level rise, desertification, glacial melt, etc. If the world continues on the current emission path, we will likely have to face a global average temperature increase of well-above 3 to 4°C, with potentially disastrous consequences.

Therefore it is high time for Parties to address the consequences of loss & damage, in parallel with stepping up their mitigation ambition.

While the negotiations in Durban will likely have the negotiations over the Kyoto Protocol, a legally binding agreement under the Convention and climate finance as its focus, progressing on the loss and damage work programme will be a crucial element for an adaptation package, along with other issues such as the establishment of the Adaptation Committee, the adoption of guidelines and modalities for National Adaptation Plans and the agreement on a next phase of the Nairobi Work Programme on Impacts, Adaptation and Vulnerability.

The work programme itself is dealt with under the Subsidiary Body for Implementation (SBI). It has acknowledged the necessity to understand exposure, explore a range of options, and look at ways to implement activities that will tangibly help avoid and reduce loss and damage. In order to further elaborate the work programme which has only been an empty shell so far, Parties made submissions on their views, and in October an expert workshop was organised in Panama. The work programme is currently organised in the following three areas:

- a. Assessing the risk of loss and damage associated with the adverse effects of climate change and the current knowledge on the same;
- b. A range of approaches to address loss and damage associated with the adverse effects of climate change, including impacts related to extreme weather events and slow onset events, taking into consideration experience at all levels;
- c. The role of the Convention in enhancing the implementation of approaches to address loss and damage associated with the adverse effects of climate change.

A synthesis report prepared by the UNFCCC Secretariat highlighted the following potential activities in the context of the role of the Convention, based on a sequential approach to the three areas<sup>14</sup>:

- Identifying existing gaps and challenges, including the issue of availability of data, in order to assess different kinds of risk, loss and damage at different levels;
- Assessing current practices and lessons learned in assessing different kinds of risk, loss and damage at different levels;
- Identifying the approaches needed to address different kinds of risk, loss and damage at different levels;
- Assessing current practices and lessons learned in addressing different kinds of risk, loss and damage at different levels.

Agreeing on a more detailed work plan for the next year would be a crucial outcome in Durban, combined with a clear mandate for COP18 to take a decision on concrete next steps, ideally the elaboration of a more comprehensive mechanism to address loss and damage under the UNFCCC in the future.

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<sup>13</sup> Decision 1/CP.16, paragraph 26

<sup>14</sup> See FCCC/SBI/2011/INF.13

## 4 Methodological Remarks

The presented analyses are based on the data collection and analysis, acknowledged worldwide, provided by Munich Re NatCatSERVICE. They comprise "all elementary loss events which have caused substantial damage to property or persons". For the countries of the world, Munich Re collects the number of total losses caused by weather events, the number of deaths, the insured damages and total economic damages. The last two indicators are stated in million US\$ (original values, inflation adjusted).

In the present analysis, only weather related events - storms, floods, as well as temperature extremes and mass movements (heat and cold waves etc.) - are incorporated. Geological factors like earthquakes, volcanic eruptions or tsunamis, for which data is also available, do not play a role in this context because they do not depend on the weather and therefore are definitely not related to climate change. To enhance the manageability of the large amount of data, the different categories within the weather related events were combined. For single case studies on particularly devastating events it is stated whether they concern floods, storms, or another type of event.

It is important to note that this event-related examination does not allow for an assessment of continuous changes of important climate parameters. A long-term decline in precipitation that was shown for some African countries as a consequence of climate change cannot be displayed by the CRI. Such parameters nevertheless often substantially influence important development factors like agricultural outputs and the availability of drinking water.

Although certainly an interesting area for analysis, the present data does also not allow for conclusions about the distribution of damages below the national level, although this would be interesting. However, the data quality would only be sufficient for a limited number of countries.

### **Analysed indicators**

For this examination the following indicators were analysed in this paper:

1. Number of deaths,
2. Number of deaths per 100 000 inhabitants,
3. Sum of losses in US\$ in purchasing power parity (PPP) as well as
4. Losses per unit of Gross Domestic Product (GDP).

For the indicators 2. to 4., economic and population data primarily by the International Monetary Fund were taken into account. However, it has to be added that especially for small (e.g. Pacific small island states) or politically extremely instable countries (e.g. Somalia), the required data is not always available in sufficient quality for the whole observed time period. Those countries have to be left out of the analyses.

The Climate Risk Index 2011 is based on the loss-figures from 2010 and 1991-2010. This ranking represents the most affected countries. Each country's index score has been de-



rived from a country's average ranking in all four analyses, according to the following weighting: death toll 1/6, deaths per inhabitants 1/3, absolute losses 1/6, losses per GDP 1/3.

Therefore, an analysis of the already observable changes in climate conditions in different regions sends a warning signal to those most affected countries to better prepare for the future. Although looking at socio-economic variables in comparison to damages and deaths caused by weather extremes – as was done in the present analysis - does not allow for an exact measurement of the vulnerability, it can be seen as at least an indication or pattern of vulnerability. In most cases, already afflicted countries will probably also be especially endangered by possible future changes in climate conditions. Despite the historic analysis, a deterministic projecting of the past to the future is not appropriate. On the one hand, the likelihood for past trends in extreme weather events to continue unchanged is very low especially in a world of global climate change.

On the other hand, new phenomena can occur in states or regions. In the year 2004, for example, a hurricane was registered in the South Atlantic, off Brazil's coast, for the first time ever. The cyclone that hit Oman in 2007 or the one which hit Saudi Arabia in 2009 are of similar significance. So the appearance in the Climate Risk Index is an alarm bell for these countries. But the analyses of the Climate Risk Index should not be seen as the only evidence for which countries are already afflicted or will be affected by global climate change. After all, people can in principle fall back on different adaptation measures. However, to which extent these can be implemented effectively depends on several factors which altogether determine the degree of vulnerability.

### **The relative consequences also depend on economic and population growth**

Identifying relative values in this index represents an important complement to the otherwise often dominating absolute values because it allows for analysing country specific data on damages in relation to real conditions in those countries. It is obvious, for example, that one billion US\$ for a rich country like the USA entail much less economic consequences than for one of the world's poorest countries. This is being backed up by the relative analysis.

It should be noted that values and therefore the rankings of countries regarding the respective indicators do not only change due to the absolute impacts of extreme weather events, but also due to economic and population growth. If, for example, population increases, which is the case in most of the countries, the same absolute number of deaths leads to a relatively lower assessment in the following year. The same applies to economic growth. However, this does not affect the significance of the relative approach. The ability of society to cope with damages, through precaution, mitigation and disaster preparedness, insurances or the improved availability of means for emergency aid, generally rises along with increasing economic strength. Nevertheless, an improved ability does not necessarily imply enhanced implementation of effective preparation and response measures. While absolute numbers tend to overestimate populous or economically capable countries, relative values place stronger weight on smaller and poorer countries. To give consideration to both effects, the analysis of the Climate Risk Index is based on

absolute and on relative scores, with a weighting that gives the relative losses a higher importance than the absolute losses.

**The indicator "losses in purchasing power parity" allows for a more comprehensive estimation of how different societies are actually affected**

The indicator “absolute losses in US\$” is being identified through purchasing power parity (PPP), because using this figure better expresses how people are actually affected by the loss of one US\$ than using nominal exchange rates. Purchasing power parity are currency exchange rates which permit a comparison of e.g. national GDP, by incorporating price differences between countries. Simplified, this means that a farmer in India can buy more crop with US\$ 1 than a farmer in the USA with US\$ 1. Therefore, the real consequences of the same nominal damage are much higher in India. For most of the countries, US\$ values according to exchange rates must therefore be multiplied by a factor bigger than one.

## Annexes

CRI = Climate Risk Index; GDP = gross domestic product; PPP = purchasing power parity

**Table 4: Climate Risk Index for 1991-2010**

(Avg. = average figure for the 20-year period)

Rank CRI	Country	Overall CRI score	Death toll		Deaths per 100,000 inhabitants		Losses in million US\$ PPP		Losses per GDP in %	
			Avg.	Rank	Avg.	Rank	Avg.	Rank	Avg.	Rank
140	Albania	120.83	1.95	130	0.06	117	12.50	127	0.07	117
94	Algeria	90.50	71.05	39	0.23	68	47.88	88	0.03	140
120	Angola	109.33	21.45	68	0.15	83	11.67	128	0.01	147
31	Antigua and Barbuda	47.17	1.00	141	1.39	15	39.41	94	3.43	9
99	Argentina	92.50	26.85	67	0.07	112	357.05	36	0.09	114
145	Armenia	123.50	0.40	154	0.01	159	19.39	117	0.17	76
44	Australia	54.50	45.70	50	0.23	68	1523.43	15	0.25	63
53	Austria	59.83	30.40	64	0.38	50	385.91	33	0.16	81
135	Azerbaijan	117.83	2.10	128	0.03	143	56.89	85	0.10	104
139	Bahrain	119.83	2.90	120	0.42	46	0.79	167	0.00	170
1	Bangladesh	8.17	7,814.35	1	5.51	3	2091.32	8	1.56	17
160	Barbados	144.17	0.05	167	0.02	154	3.09	156	0.07	117
150	Belarus	127.67	4.20	110	0.04	133	26.53	110	0.03	140
73	Belgium	77.00	85.70	33	0.83	24	49.47	87	0.02	147
29	Belize	44.67	2.40	124	0.93	23	57.52	84	3.63	7
147	Benin	126.33	3.80	113	0.05	124	4.83	151	0.06	123
82	Bhutan	82.17	2.30	125	0.39	49	4.85	150	0.26	60
34	Bolivia	48.83	36.00	57	0.42	46	127.81	62	0.43	41
124	Bosnia and Herzegovina	111.67	0.35	156	0.01	159	65.64	80	0.27	58
118	Botswana	108.00	1.50	136	0.09	100	17.90	118	0.11	97
96	Brazil	91.17	121.05	24	0.07	112	566.64	31	0.04	134
174	Brunei Darussalam	160.33	0.10	166	0.03	143	0.32	170	0.00	170
93	Bulgaria	90.33	5.05	102	0.06	117	183.14	54	0.17	76
103	Burkina Faso	95.33	5.55	101	0.05	124	31.58	103	0.26	60
91	Burundi	89.00	6.75	93	0.10	97	7.62	141	0.31	53
37	Cambodia	50.33	38.30	56	0.31	60	113.13	64	0.77	31
152	Cameroon	134.67	6.20	96	0.04	133	4.35	152	0.01	147
110	Canada	100.67	11.80	80	0.04	133	672.85	24	0.07	117
129	Cape Verde	115.83	0.15	162	0.03	143	3.80	153	0.37	47
166	Central African Republic	152.50	0.90	142	0.02	154	0.30	171	0.01	147
112	Chad	101.00	4.85	104	0.06	117	20.02	116	0.17	76
101	Chile	93.83	15.55	72	0.10	97	121.85	63	0.07	117
21	China	39.83	2,079.70	5	0.16	81	28600.88	2	0.64	35
43	Chinese Taipei	53.33	77.40	37	0.35	54	812.36	23	0.17	76
47	Colombia	55.17	99.65	27	0.25	66	594.00	28	0.21	72
179	Comoros	171.17	0.00	172	0.00	168	0.00	179	0.00	170
69	Costa Rica	71.17	9.80	82	0.23	68	72.61	77	0.24	66
158	Cote d'Ivoire	140.50	4.40	108	0.03	143	3.16	155	0.01	147
64	Croatia	67.00	34.75	59	0.78	26	62.03	83	0.10	104
61	Cuba	65.17	6.95	92	0.06	117	2301.23	5	0.80	30
104	Cyprus	95.67	3.60	114	0.51	38	9.15	138	0.06	123
70	Czech Republic	73.50	8.00	87	0.08	104	577.53	30	0.27	58
154	Democratic Republic of Congo	136.50	14.35	74	0.03	143	1.01	165	0.01	147

Rank CRI	Country	Overall CRI score	Death toll		Deaths per 100,000 inhabitants		Losses in milli- on US\$ PPP		Losses per GDP in %	
			Avg.	Rank	Avg.	Rank	Avg.	Rank	Avg.	Rank
176	Democratic Republic of Timor-Leste	166.67	0.10	166	0.01	159	0.07	176	0.00	170
133	Denmark	117.00	0.80	147	0.01	159	191.85	51	0.12	93
41	Djibouti	53.00	8.75	85	1.31	18	9.98	133	0.73	32
57	Dominica	61.00	0.25	159	0.35	54	38.37	95	5.98	2
7	Dominican Republic	30.50	211.55	20	2.51	7	181.49	55	0.37	47
24	Ecuador	42.00	63.25	41	0.49	39	282.96	39	0.37	47
125	Egypt	112.50	42.30	52	0.07	112	30.00	105	0.01	147
23	El Salvador	40.33	32.00	62	0.58	32	205.74	50	0.66	33
179	Equatorial Guinea	171.17	0.00	172	0.00	168	0.00	179	0.00	170
123	Eritrea	110.33	0.15	162	0.00	168	28.08	106	0.84	29
148	Estonia	127.17	0.40	154	0.03	143	20.41	115	0.10	104
100	Ethiopia	93.00	91.25	29	0.14	87	26.76	109	0.06	123
37	Fiji	50.33	6.00	98	0.74	28	32.86	102	1.11	23
167	Finland	153.50	0.15	162	0.00	168	11.38	129	0.01	147
102	Former Yugoslav Republic of Macedonia	94.50	0.85	145	0.04	133	74.49	76	0.45	40
26	France	42.67	965.45	8	1.62	13	1616.78	14	0.10	104
178	Gabon	171.00	0.00	172	0.00	168	0.04	178	0.00	170
114	Georgia	102.67	3.55	115	0.04	133	34.49	99	0.23	68
32	Germany	48.50	475.15	12	0.58	32	2185.51	7	0.10	104
127	Ghana	113.83	16.40	71	0.09	100	10.25	132	0.03	140
86	Greece	83.67	13.45	76	0.12	94	259.15	44	0.11	97
15	Grenada	37.00	2.00	129	1.98	10	86.85	71	8.84	1
12	Guatemala	33.33	85.35	34	0.76	27	273.95	40	0.57	36
163	Guinea	150.00	1.85	132	0.02	154	0.87	166	0.01	147
131	Guinea-Bissau	116.67	0.10	166	0.01	159	7.53	142	0.55	37
97	Guyana	92.33	0.30	157	0.04	133	41.70	91	1.16	20
5	Haiti	21.17	340.65	16	3.95	5	154.57	57	1.12	22
3	Honduras	11.67	327.75	17	5.05	4	662.27	25	2.93	10
179	Hong Kong SAR	171.17	0.00	172	0.00	168	0.00	179	0.00	170
63	Hungary	66.50	33.95	60	0.33	56	206.35	49	0.14	89
119	Iceland	108.50	1.80	133	0.63	30	1.06	164	0.01	147
20	India	38.33	3,198.80	3	0.31	60	6233.37	3	0.32	52
47	Indonesia	55.17	288.40	18	0.14	87	1619.11	13	0.25	63
165	Iraq	151.33	0.90	142	0.00	168	9.66	136	0.01	147
143	Ireland	122.17	1.90	131	0.05	124	53.95	86	0.04	134
14	Islamic Republic of Afghanistan	36.83	351.60	15	1.32	17	70.37	78	0.37	47
40	Islamic Republic of Iran	50.67	86.75	32	0.13	91	2327.91	4	0.41	43
113	Israel	101.50	5.00	103	0.08	104	107.41	66	0.08	116
25	Italy	42.17	1,005.55	7	1.74	11	1522.85	16	0.10	104
56	Jamaica	60.83	4.65	105	0.18	75	176.49	56	0.89	27
95	Japan	90.67	67.10	40	0.05	124	1939.29	10	0.06	123
151	Jordan	129.83	2.55	123	0.05	124	7.65	140	0.04	134
128	Kazakhstan	114.67	12.45	78	0.08	104	27.08	108	0.02	147
74	Kenya	77.17	49.20	48	0.16	81	66.86	79	0.15	87
117	Kiribati	106.83	0.00	172	0.00	168	16.87	121	3.86	6
9	Korea, DPR	30.83	74.85	38	0.33	56	1171.75	19	3.61	8
57	Korea, Republic	61.00	89.95	30	0.19	72	1233.75	18	0.15	87
169	Kuwait	154.50	0.85	145	0.04	133	0.07	176	0.00	170

Rank CRI	Country	Overall CRI score	Death toll		Deaths per 100,000 inhabitants		Losses in milli- on US\$ PPP		Losses per GDP in %	
			Avg.	Rank	Avg.	Rank	Avg.	Rank	Avg.	Rank
70	Kyrgyz Re- public	73.50	19.05	70	0.38	50	16.33	123	0.19	74
76	Lao People's Democratic Republic	79.17	3.45	117	0.06	117	77.27	74	0.95	25
79	Latvia	81.50	4.00	111	0.17	78	62.24	82	0.22	70
141	Lebanon	121.00	2.30	125	0.07	112	17.77	119	0.05	129
115	Lesotho	105.17	0.25	159	0.01	159	24.79	112	1.14	21
171	Liberia	157.00	0.30	157	0.01	159	0.19	173	0.01	147
172	Libya	158.00	0.00	172	0.00	168	6.57	146	0.01	147
133	Lithuania	117.00	2.60	122	0.08	104	21.83	114	0.05	129
105	Luxembourg	95.83	6.50	95	1.47	14	2.83	158	0.01	147
28	Madagascar	43.83	80.70	36	0.49	39	75.10	75	0.55	37
60	Malawi	62.50	29.80	65	0.24	67	34.93	98	0.46	39
87	Malaysia	85.00	41.95	54	0.18	75	148.20	60	0.06	123
156	Maldives	138.33	0.00	172	0.00	168	2.20	160	0.16	81
137	Mali	118.83	3.05	119	0.03	143	12.94	126	0.13	91
170	Malta	155.50	0.00	172	0.00	168	2.92	157	0.04	134
92	Mauritania	90.17	3.95	112	0.15	83	10.64	131	0.24	66
109	Mauritius	99.67	0.55	151	0.05	124	35.74	97	0.33	51
49	Mexico	58.17	138.20	23	0.14	87	2243.51	6	0.20	73
45	Moldova	54.67	6.60	94	0.17	78	185.29	52	2.15	13
11	Mongolia	32.83	12.90	77	0.53	36	309.59	38	4.59	5
88	Morocco	85.17	27.30	66	0.10	97	112.33	65	0.12	93
19	Mozambique	38.17	87.25	31	0.49	39	95.97	68	0.92	26
2	Myanmar	10.50	7,130.20	2	14.06	1	658.69	27	1.68	16
79	Namibia	81.50	8.00	87	0.44	43	10.96	130	0.12	93
17	Nepal	37.17	273.35	19	1.12	20	81.61	72	0.38	46
72	Netherlands	74.33	84.60	35	0.53	36	152.88	59	0.03	140
78	New Zealand	80.17	3.55	115	0.09	100	224.07	46	0.26	60
4	Nicaragua	18.00	159.65	21	2.83	6	212.13	47	1.90	14
89	Niger	86.33	7.05	91	0.06	117	27.82	107	0.41	43
136	Nigeria	118.50	45.20	51	0.04	133	34.38	100	0.01	147
152	Norway	134.67	1.20	139	0.03	143	45.51	89	0.02	147
37	Oman	50.33	6.20	96	0.26	63	463.82	32	0.98	24
8	Pakistan	30.67	558.75	11	0.40	48	1833.92	11	0.66	33
110	Panama	100.67	9.60	83	0.32	59	9.74	135	0.04	134
45	Papua New Guinea	54.67	33.95	60	0.65	29	30.86	104	0.31	53
97	Paraguay	92.33	5.95	99	0.11	96	33.98	101	0.16	81
62	Peru	66.33	93.75	28	0.37	52	154.10	58	0.10	104
10	Philippines	31.83	801.40	9	1.03	22	659.79	26	0.30	56
65	Poland	67.83	46.30	49	0.12	94	911.10	22	0.19	74
22	Portugal	40.17	142.65	22	1.39	15	334.88	37	0.17	76
179	Qatar	171.17	0.00	172	0.00	168	0.00	179	0.00	170
142	Republic of Congo	121.17	7.95	89	0.26	63	0.29	172	0.00	170
59	Republic of Yemen	62.33	52.60	47	0.29	62	102.20	67	0.23	68
30	Romania	46.33	58.55	45	0.26	63	941.17	21	0.41	43
18	Russia	37.50	2,931.10	4	2.01	9	1963.94	9	0.11	97
115	Rwanda	105.17	7.10	90	0.09	100	6.41	147	0.11	97
51	Samoa	58.67	0.65	148	0.37	52	40.35	92	5.41	4
179	Sao Tome and Principe	171.17	0.00	172	0.00	168	0.00	179	0.00	170
122	Saudi Arabia	110.00	14.40	73	0.07	112	94.49	69	0.02	147
154	Senegal	136.50	3.45	117	0.03	143	6.11	148	0.04	134
131	Serbia, Monte- negro, Kosovo	116.67	0.45	153	0.01	159	264.89	43	0.12	93

Rank CRI	Country	Overall CRI score	Death toll		Deaths per 100,000 inhabitants		Losses in milli- on US\$ PPP		Losses per GDP in %	
			Avg.	Rank	Avg.	Rank	Avg.	Rank	Avg.	Rank
173	<b>Seychelles</b>	159.50	0.00	172	0.00	168	0.35	169	0.03	140
130	<b>Sierra Leone</b>	116.33	8.05	86	0.18	75	0.60	168	0.02	147
177	<b>Singapore</b>	166.83	0.10	166	0.00	168	2.43	159	0.00	170
108	<b>Slovak Re- public</b>	98.83	4.50	107	0.08	104	90.19	70	0.10	104
68	<b>Slovenia</b>	70.83	12.05	79	0.60	31	43.00	90	0.11	97
52	<b>Solomon Is- lands</b>	59.50	10.75	81	2.50	8	3.43	154	0.31	53
83	<b>South Africa</b>	82.67	60.80	43	0.14	87	242.20	45	0.07	117
27	<b>Spain</b>	43.67	706.35	10	1.70	12	990.96	20	0.10	104
77	<b>Sri Lanka</b>	79.50	34.95	58	0.19	72	63.49	81	0.11	97
50	<b>St. Kitts and Nevis</b>	58.50	0.20	161	0.43	44	35.87	96	5.66	3
41	<b>St. Lucia</b>	53.00	1.70	135	1.10	21	25.43	111	1.88	15
67	<b>St. Vincent and the Grenadines</b>	69.67	0.60	149	0.56	35	7.19	143	0.87	28
85	<b>Sudan</b>	83.50	42.30	52	0.13	91	81.26	73	0.11	97
174	<b>Suriname</b>	160.33	0.15	162	0.03	143	0.16	174	0.00	170
121	<b>Swaziland</b>	109.50	0.90	142	0.08	104	6.63	145	0.16	81
149	<b>Sweden</b>	127.33	1.35	137	0.02	154	131.58	61	0.05	129
32	<b>Switzerland</b>	48.50	59.35	44	0.82	25	381.53	35	0.16	81
161	<b>Syrian Arab Republic</b>	145.00	1.75	134	0.01	159	15.64	124	0.02	147
13	<b>Tajikistan</b>	35.00	31.15	63	0.48	42	273.72	41	2.88	11
126	<b>Tanzania</b>	113.50	20.10	69	0.06	117	16.95	120	0.05	129
55	<b>Thailand</b>	60.17	116.65	26	0.19	72	589.19	29	0.16	81
36	<b>The Bahamas</b>	49.67	1.30	138	0.43	44	210.47	48	2.78	12
83	<b>The Gambia</b>	82.67	4.30	109	0.33	56	5.03	149	0.25	63
157	<b>Togo</b>	139.33	2.20	127	0.04	133	1.15	163	0.03	140
54	<b>Tonga</b>	60.00	1.15	140	1.15	19	6.67	144	1.18	19
159	<b>Trinidad and Tobago</b>	142.00	0.60	149	0.05	124	2.18	161	0.01	147
168	<b>Tunisia</b>	153.67	2.80	121	0.03	143	0.09	175	0.00	170
106	<b>Turkey</b>	97.83	53.45	46	0.08	104	184.43	53	0.03	140
164	<b>Turkmenistan</b>	150.83	0.00	172	0.00	168	7.98	139	0.05	129
107	<b>Uganda</b>	98.67	38.50	55	0.15	83	13.17	125	0.06	123
75	<b>Ukraine</b>	79.00	61.45	42	0.13	91	267.19	42	0.10	104
162	<b>United Arab Emirates</b>	146.00	0.50	152	0.02	154	16.49	122	0.01	147
66	<b>United King- dom</b>	68.67	119.00	25	0.20	71	1435.87	17	0.09	114
34	<b>United States</b>	48.83	424.50	14	0.15	83	31053.91	1	0.30	56
90	<b>Uruguay</b>	88.50	5.70	100	0.17	78	40.32	93	0.13	91
146	<b>Uzbekistan</b>	125.67	13.50	75	0.05	124	9.46	137	0.02	147
138	<b>Vanuatu</b>	119.33	0.10	166	0.05	124	1.67	162	0.22	70
15	<b>Venezuela</b>	37.00	1,518.20	6	6.22	2	382.18	34	0.14	89
6	<b>Vietnam</b>	21.50	445.35	13	0.57	34	1808.63	12	1.19	18
144	<b>Zambia</b>	123.17	4.65	105	0.04	133	9.83	134	0.07	117
79	<b>Zimbabwe</b>	81.50	9.25	84	0.08	104	22.35	113	0.42	42

Table 5: Climate Risk Index 2010

Rank CRI 2010	Country	Overall CRI score	Death toll		Deaths per 100,000 inhabitants		Losses in milli- on US\$ (PPP)		Losses in million USD per unit GDP (in %)	
			Total	Rank	Total	Rank	Total	Rank	Total	Rank
105	Albania	85.00	0	113	0.00	112	10.05	71	0.04	51
117	Algeria	92.33	7	76	0.02	95	0.16	118	0.00	85
34	Angola	41.50	156	17	0.82	10	7.30	76	0.01	68
87	Antigua and Bar- buda	76.33	0	113	0.00	112	6.86	77	0.40	22
78	Argentina	69.50	32	43	0.08	70	18.37	64	0.00	85
135	Armenia	106.17	0	113	0.00	112	0.00	130	0.00	85
21	Australia	31.50	27	45	0.12	56	5,863.41	6	0.66	13
105	Austria	85.00	3	90	0.04	86	6.81	78	0.00	85
68	Azerbaijan	63.83	3	90	0.03	89	100.49	39	0.11	38
135	Bahrain	106.17	0	113	0.00	112	0.00	130	0.00	85
58	Bangladesh	60.83	122	22	0.07	72	19.75	63	0.01	68
82	Barbados	71.50	0	113	0.00	112	30.66	52	0.49	20
131	Belarus	104.50	0	113	0.00	112	0.12	120	0.00	85
73	Belgium	65.83	5	81	0.05	81	135.46	36	0.03	58
74	Belize	67.50	0	113	0.00	112	36.33	50	1.36	9
14	Benin	26.50	53	33	0.55	19	63.66	46	0.46	21
135	Bhutan	106.17	0	113	0.00	112	0.00	130	0.00	85
18	Bolivia	28.00	33	41	0.32	33	278.63	27	0.58	17
85	Bosnia and Her- zegovina	75.17	3	90	0.08	70	3.69	85	0.01	68
135	Botswana	106.17	0	113	0.00	112	0.00	130	0.00	85
23	Brazil	33.83	429	5	0.22	44	1,233.36	16	0.06	47
135	Brunei Darussa- lam	106.17	0	113	0.00	112	0.00	130	0.00	85
125	Bulgaria	99.00	0	113	0.00	112	3.19	87	0.00	85
79	Burkina Faso	69.67	16	63	0.11	64	1.82	91	0.01	68
135	Burundi	106.17	0	113	0.00	112	0.00	130	0.00	85
39	Cambodia	47.33	8	74	0.06	77	208.24	32	0.69	12
93	Cameroon	81.00	13	66	0.06	77	1.40	96	0.00	85
71	Canada	65.17	7	76	0.02	95	549.40	23	0.04	51
135	Cape Verde	106.17	0	113	0.00	112	0.00	130	0.00	85
97	Central African Republic	81.67	3	90	0.06	77	0.35	110	0.01	68
42	Chad	49.50	27	45	0.26	38	8.14	74	0.04	51
135	Chile	106.17	0	113	0.00	112	0.00	130	0.00	85
9	China	23.50	2889	2	0.22	44	33,394.75	1	0.33	25
44	Chinese Taipei	52.17	17	62	0.07	72	661.89	21	0.08	43
3	Colombia	8.00	320	7	0.70	12	7,543.56	5	1.73	6
135	Comoros	106.17	0	113	0.00	112	0.00	130	0.00	85
40	Cook Islands	48.67	3	90	27.27	2	20.00	62	0.01	68
20	Costa Rica	30.00	24	53	0.52	20	143.41	35	0.28	26
111	Cote d'Ivoire	87.50	11	71	0.05	81	0.08	122	0.00	85
84	Croatia	74.50	0	113	0.00	112	103.80	38	0.13	36
135	Cyprus	106.17	0	113	0.00	112	0.00	130	0.00	85
44	Czech Republic	52.17	10	72	0.10	65	259.44	29	0.10	41
97	Democratic Re- public of Congo	81.67	27	45	0.04	86	0.71	103	0.00	85
135	Democratic Re- public of Timor- Leste	106.17	0	113	0.00	112	0.00	130	0.00	85
135	Denmark	106.17	0	113	0.00	112	0.00	130	0.00	85
135	Djibouti	106.17	0	113	0.00	112	0.00	130	0.00	85
63	Dominica	63.17	0	113	0.00	112	100.00	40	10.50	1

Rank CRI 2010	Country	Overall CRI score	Death toll		Deaths per 100,000 inhabitants		Losses in milli- on US\$ (PPP)		Losses in million USD per unit GDP (in %)	
			Total	Rank	Total	Rank	Total	Rank	Total	Rank
			121	Dominican Re- public	95.50	1	105	0.01	106	3.56
112	Ecuador	87.67	4	83	0.03	89	1.44	95	0.00	85
63	Egypt	62.17	43	38	0.06	77	68.63	45	0.01	68
36	El Salvador	42.17	18	61	0.31	34	46.66	48	0.11	38
135	Equatorial Guinea	106.17	0	113	0.00	112	0.00	130	0.00	85
135	Eritrea	106.17	0	113	0.00	112	0.00	130	0.00	85
135	Estonia	106.17	0	113	0.00	112	0.00	130	0.00	85
108	Ethiopia	86.67	19	60	0.02	95	0.87	100	0.00	85
23	Fiji	33.83	3	90	0.34	32	97.49	41	2.44	4
92	Finland	80.33	0	113	0.00	112	78.48	43	0.04	51
135	Former Yugoslav Republic of Ma- cedonia	106.17	0	113	0.00	112	0.00	130	0.00	85
26	France	35.17	75	29	0.12	56	4,782.52	8	0.22	31
128	Gabon	101.83	0	113	0.00	112	0.52	104	0.00	85
129	Georgia	102.67	0	113	0.00	112	0.39	109	0.00	85
46	Germany	53.17	28	44	0.03	89	2,351.57	11	0.08	43
33	Ghana	41.00	109	25	0.46	22	20.08	61	0.03	58
124	Greece	98.17	2	99	0.02	95	0.00	130	0.00	85
133	Grenada	105.50	0	113	0.00	112	0.02	126	0.00	85
2	Guatemala	6.33	229	12	1.59	4	1,969.65	12	2.80	3
102	Guinea	83.67	7	76	0.07	72	0.26	112	0.00	85
103	Guinea-Bissau	84.50	2	99	0.12	56	0.02	126	0.00	85
135	Guyana	106.17	0	113	0.00	112	0.00	130	0.00	85
28	Haiti	35.83	60	31	0.61	15	10.64	70	0.09	42
5	Honduras	14.67	139	19	1.73	3	219.79	31	0.65	16
135	Hong Kong SAR	106.17	0	113	0.00	112	0.00	130	0.00	85
69	Hungary	64.50	1	105	0.01	106	636.54	22	0.34	24
135	Iceland	106.17	0	113	0.00	112	0.00	130	0.00	85
31	India	39.50	1844	4	0.15	50	1,119.94	17	0.03	58
41	Indonesia	49.00	290	9	0.12	56	106.52	37	0.01	68
135	Iraq	106.17	0	113	0.00	112	0.00	130	0.00	85
134	Ireland	106.00	0	113	0.00	112	0.01	129	0.00	85
16	Islamic Republic of Afghanistan	26.83	401	6	1.33	5	22.44	59	0.08	43
123	Islamic Republic of Iran	97.00	8	74	0.01	106	0.02	126	0.00	85
12	Israel	24.83	45	37	0.61	15	517.91	24	0.24	29
110	Italy	87.33	13	66	0.02	95	1.30	98	0.00	85
22	Jamaica	32.67	13	66	0.48	21	88.99	42	0.37	23
90	Japan	77.67	21	55	0.02	95	32.90	51	0.00	85
135	Jordan	106.17	0	113	0.00	112	0.00	130	0.00	85
55	Kazakhstan	58.83	46	36	0.28	36	7.35	75	0.00	85
43	Kenya	49.67	93	26	0.23	41	14.53	66	0.02	62
135	Kiribati	106.17	0	113	0.00	112	0.00	130	0.00	85
100	Korea, Republic	83.17	10	72	0.02	95	14.45	67	0.00	85
132	Kuwait	105.33	0	113	0.00	112	0.05	125	0.00	85
130	Kyrgyz Republic	104.33	0	113	0.00	112	0.13	119	0.00	85
135	Lao People's Democratic Re- public	106.17	0	113	0.00	112	0.00	130	0.00	85
135	Latvia	106.17	0	113	0.00	112	0.00	130	0.00	85
103	Lebanon	84.50	1	105	0.03	89	3.04	88	0.01	68
91	Lesotho	79.83	4	83	0.16	48	0.00	130	0.00	85
116	Liberia	90.83	1	105	0.02	95	0.19	114	0.01	68
135	Libya	106.17	0	113	0.00	112	0.00	130	0.00	85



Rank CRI 2010	Country	Overall CRI score	Death toll		Deaths per 100,000 inhabitants		Losses in milli- on US\$ (PPP)		Losses in million USD per unit GDP (in %)	
			Total	Rank	Total	Rank	Total	Rank	Total	Rank
			99	Lithuania	82.50	4	83	0.12	56	0.00
95	Luxembourg	81.33	0	113	0.00	112	23.18	57	0.06	47
27	Madagascar	35.83	86	27	0.40	27	22.61	58	0.11	38
105	Malawi	86.50	0	113	0.00	112	4.78	80	0.04	51
122	Malaysia	96.67	4	83	0.01	106	0.18	115	0.00	85
135	Maldives	106.17	0	113	0.00	112	0.00	130	0.00	85
62	Mali	62.00	25	52	0.19	47	1.83	90	0.01	68
135	Malta	106.17	0	113	0.00	112	0.00	130	0.00	85
37	Mauritania	43.50	21	55	0.66	14	3.70	84	0.06	47
135	Mauritius	106.17	0	113	0.00	112	0.00	130	0.00	85
17	Mexico	27.67	157	16	0.14	54	8,181.53	4	0.52	19
48	Moldova	55.50	1	105	0.03	89	160.60	34	1.46	8
135	Mongolia	106.17	0	113	0.00	112	0.00	130	0.00	85
47	Morocco	54.33	43	40	0.14	54	27.01	54	0.02	62
59	Mozambique	61.00	33	41	0.15	50	2.76	89	0.01	68
77	Myanmar	68.83	123	21	0.20	46	0.00	130	0.00	85
66	Namibia	63.33	12	69	0.57	18	0.47	105	0.00	85
56	Nepal	58.83	122	22	0.43	25	0.27	111	0.00	85
115	Netherlands	90.33	1	105	0.01	106	24.42	55	0.00	85
83	New Zealand	74.00	1	105	0.02	95	50.75	47	0.04	51
35	Nicaragua	41.83	59	32	1.01	7	4.31	81	0.02	62
61	Niger	61.50	7	76	0.05	81	17.23	65	0.15	33
54	Nigeria	58.67	133	20	0.09	68	20.85	60	0.01	68
135	Norway	106.17	0	113	0.00	112	0.00	130	0.00	85
6	Oman	17.00	24	53	0.81	11	1313.63	15	1.73	6
1	Pakistan	3.50	1891	3	1.10	6	25,315.99	2	5.42	2
75	Panama	68.17	16	63	0.45	23	0.00	130	0.00	85
119	Papua New Guinea	94.83	2	99	0.03	89	0.08	122	0.00	85
101	Paraguay	83.50	6	80	0.09	68	0.18	115	0.00	85
11	Peru	24.33	171	15	0.58	17	363.20	25	0.13	36
14	Philippines	26.50	244	11	0.26	38	970.86	18	0.26	27
7	Poland	17.83	151	18	0.40	27	4,745.06	9	0.66	13
8	Portugal	19.67	47	35	0.44	24	1,749.45	13	0.71	11
135	Qatar	106.17	0	113	0.00	112	0.00	130	0.00	85
135	Republic of Congo	106.17	0	113	0.00	112	0.00	130	0.00	85
63	Republic of Yemen	62.17	61	30	0.25	40	1.73	93	0.00	85
23	Romania	33.83	26	51	0.12	56	1,676.05	14	0.66	13
4	Russia	11.00	56165	1	39.30	1	5,536.92	7	0.25	28
120	Rwanda	95.33	2	99	0.02	95	0.22	113	0.00	85
135	Samoa	106.17	0	113	0.00	112	0.00	130	0.00	85
135	Sao Tome and Principe	106.17	0	113	0.00	112	0.00	130	0.00	85
57	Saudi Arabia	59.17	27	45	0.10	65	70.88	44	0.01	68
135	Senegal	106.17	0	113	0.00	112	0.00	130	0.00	85
109	Serbia, Montenegro, Kosovo	87.00	4	83	0.05	81	0.40	107	0.00	85
135	Seychelles	106.17	0	113	0.00	112	0.00	130	0.00	85
81	Sierra Leone	71.17	16	63	0.27	37	0.12	120	0.00	85
112	Singapore	87.67	0	113	0.00	112	29.61	53	0.01	68
72	Slovak Republic	65.33	4	83	0.07	72	41.35	49	0.03	58
51	Slovenia	58.00	3	90	0.15	50	23.74	56	0.04	51
32	Solomon Islands	40.83	2	99	0.38	29	12.65	68	0.77	10
53	South Africa	58.17	115	24	0.23	41	8.20	73	0.00	85
60	Spain	61.17	21	55	0.05	81	342.51	26	0.02	62

Rank CRI 2010	Country	Overall CRI score	Death toll		Deaths per 100,000 inhabitants		Losses in milli- on US\$ (PPP)		Losses in million USD per unit GDP (in %)	
			Total	Rank	Total	Rank	Total	Rank	Total	Rank
49	<b>Sri Lanka</b>	56.67	76	28	0.37	30	4.26	82	0.00	85
135	<b>St. Kitts and Ne- vis</b>	106.17	0	113	0.00	112	0.00	130	0.00	85
135	<b>St. Lucia</b>	106.17	0	113	0.00	112	0.00	130	0.00	85
135	<b>St. Vincent and the Grenadines</b>	106.17	0	113	0.00	112	0.00	130	0.00	85
76	<b>Sudan</b>	68.33	50	34	0.12	56	1.53	94	0.00	85
135	<b>Suriname</b>	106.17	0	113	0.00	112	0.00	130	0.00	85
135	<b>Swaziland</b>	106.17	0	113	0.00	112	0.00	130	0.00	85
135	<b>Sweden</b>	106.17	0	113	0.00	112	0.00	130	0.00	85
118	<b>Switzerland</b>	92.67	1	105	0.01	106	11.79	69	0.00	85
126	<b>Syrian Arab Re- public</b>	99.67	0	113	0.00	112	1.82	91	0.00	85
10	<b>Tajikistan</b>	24.17	27	45	0.35	31	262.13	28	1.77	5
135	<b>Tanzania</b>	106.17	0	113	0.00	112	0.00	130	0.00	85
13	<b>Thailand</b>	25.17	261	10	0.41	26	799.19	19	0.14	35
49	<b>The Bahamas</b>	56.83	3	90	0.87	9	1.34	97	0.01	68
67	<b>The Gambia</b>	63.67	12	69	0.69	13	0.17	117	0.00	85
51	<b>Togo</b>	58.00	21	55	0.30	35	0.94	99	0.02	62
86	<b>Tonga</b>	76.00	0	113	0.00	112	4.15	83	0.55	18
127	<b>Trinidad and Tobago</b>	101.50	0	113	0.00	112	0.80	102	0.00	85
135	<b>Tunisia</b>	106.17	0	113	0.00	112	0.00	130	0.00	85
88	<b>Turkey</b>	76.50	27	45	0.04	86	8.36	72	0.00	85
135	<b>Turkmenistan</b>	106.17	0	113	0.00	112	0.00	130	0.00	85
29	<b>Uganda</b>	37.83	307	8	0.90	8	6.71	79	0.02	62
89	<b>Ukraine</b>	77.33	0	113	0.00	112	177.11	33	0.06	47
94	<b>United Arab Emi- rates</b>	81.17	5	81	0.10	65	0.45	106	0.00	85
70	<b>United Kingdom</b>	64.67	3	90	0.00	112	3856.43	10	0.18	32
30	<b>United States</b>	37.50	229	12	0.07	72	22,046.60	3	0.15	33
96	<b>Uruguay</b>	81.50	4	83	0.12	56	0.06	124	0.00	85
135	<b>Uzbekistan</b>	106.17	0	113	0.00	112	0.00	130	0.00	85
135	<b>Vanuatu</b>	106.17	0	113	0.00	112	0.00	130	0.00	85
38	<b>Venezuela</b>	43.33	43	38	0.15	50	240.39	30	0.07	46
19	<b>Vietnam</b>	29.00	203	14	0.23	41	667.24	20	0.24	29
80	<b>Zambia</b>	70.33	21	55	0.16	48	0.81	101	0.00	85
114	<b>Zimbabwe</b>	88.67	2	99	0.02	95	0.40	107	0.01	68



## Germanwatch

Following the motto "Observing, Analysing, Acting", Germanwatch has been actively promoting North-South equity and the preservation of livelihoods since 1991. In doing so, we focus on the politics and economics of the North with their worldwide consequences. The situation of marginalised people in the South is the starting point of our work. Together with our members and supporters as well as with other actors in civil society we intend to represent a strong lobby for sustainable development. We endeavour to approach our aims by advocating fair trade relations, responsible financial markets, compliance with human rights, and the prevention of dangerous climate change.

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For further information, please contact one of our offices

### **Germanwatch - Berlin Office**

Schiffbauerdamm 15

10117 Berlin, Germany

Ph.: +49 (0) 30 - 28 88 356-0

Fax: +49 (0) 30 - 28 88 356-1

### **Germanwatch - Bonn Office**

Dr. Werner-Schuster-Haus

Kaiserstraße 201

53113 Bonn, Germany

Ph.: +49 (0) 228 - 60492-0

Fax: +49 (0) 228 - 60492-19

E-Mail: [info@germanwatch.org](mailto:info@germanwatch.org)

or visit our website:

**[www.germanwatch.org](http://www.germanwatch.org)**