

# GLOBAL CLIMATE RISK INDEX 2013

WHO SUFFERS MOST FROM EXTREME WEATHER  
EVENTS? WEATHER-RELATED LOSS EVENTS IN 2011  
AND 1992 TO 2011

Sven Harmeling and David Eckstein



## Summary

The Global Climate Risk Index 2013 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 2011 as well as for the period 1992-2011 were taken into account.

Most affected countries in 2011 were Thailand, Cambodia, Pakistan, El Salvador and the Philippines. For the period 1992 to 2011, Honduras, Myanmar and Nicaragua rank highest.

This year's 8th edition of the analysis reconfirms 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.

COP 18 held in Doha, Qatar, provides a decisive moment and should deliver a turning point by which the international community now starts scaling-up the international response to addressing climate change and its increasing loss and damage. The time window for putting the world on a track to stay below 2°C is closing rapidly, and Doha should insert new dynamics.

## Imprint

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Germanwatch thanks Munich RE (in particular Petra Löw and Jakob Alfredo) for their support (especially the provision of the core data which are the basis for the Global Climate Risk Index).

**Publisher:** Germanwatch e.V.

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November 2012

Purchase order number: 13-2-03e

ISBN 978-3-943704-04-4

This publication can be downloaded at: [www.germanwatch.org/en/cri](http://www.germanwatch.org/en/cri)

Prepared with financial support from the German Federal Ministry for Economic Cooperation and Development (BMZ).



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## How to read the Global Climate Risk Index

The Germanwatch Global Climate Risk Index is an analysis based on one of the most reliable available data sets on the impacts of extreme weather events and associated socio-economic data. The Germanwatch Climate Risk Index 2013 is the 8<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, but for example 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. There is also an increasing number of particularly extreme weather events where science has recently made stronger statements about the influence of climate change (such as the Russian heat wave 2010, Pakistan floods 2010).

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 in particular in a longer-term comparison, including the socio-economic data, mean that the analysis does not encompass some very small countries such as certain small island states. 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 Honduras, Myanmar and Nicaragua were the countries most affected by extreme weather events from 1992 to 2011.
- Eight of the ten most affected countries (1992-2011) were developing countries in the low-income or lower-middle income country group – two belong to the upper-middle income countries.
- In total, more than 530,000 people died as a direct consequence from almost 15,000 extreme weather events, and losses of more than 2.5 trillion USD (in PPP<sup>1</sup>) occurred from 1992 to 2011 (USD 1.68 trillion overall losses in original values).
- In 2011, the ranking of the most affected countries is led by Thailand, Cambodia, Pakistan, El Salvador and the Philippines.
- Loss and damage from anthropogenic climate change is expected to further increase, potentially with large scale dangerous impacts if the global community does not immediately scale up its action to mitigate climate change and to adaptation. An ambitious work programme on near-term mitigation as well as Kyoto II targets in line with the 2°C limit are key actions to be taken.
- At COP 18, Parties will discuss next steps as a result of the loss and damage work programme. A range of approaches shall be considered, including an international mechanism. COP 18 should take a committed step forward towards establishing a consolidated international response.
- 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. Clear commitments for climate finance beyond 2012 and a plan for scaling-up towards 2020 would be a substantial outcome of Doha.

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<sup>1</sup> PPP = Purchasing Power Parities

# 1 Key results of the Global Climate Risk Index 2013

People all over the world have to face the reality of climate variability, in many parts of the world an increased variability. More than 530,000 people died as a direct consequence of almost 15,000 extreme weather events, and losses of more than USD 2.5 trillion (in PPP) occurred from 1992 to 2011 globally. A recent study published by the World Bank highlights the existential threats the world and in particular the vulnerable people in developing countries would face in a 4°C world, a temperature increase which still can and must be avoided by the international community. However, if mitigation action is not stepped up drastically the world is on the path to dangerous climate change.<sup>2</sup>

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.

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 based on 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.

## **Countries most affected in the period of 1992-2011**

**Honduras, Myanmar and Nicaragua** have been identified to be the most affected in this 20-year period.<sup>5</sup> They are followed by **Bangladesh, Haiti and Viet Nam**. 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.

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<sup>2</sup> see World Bank, 2012: Turn down the heat: why a 4°C world must be avoided.

<http://climatechange.worldbank.org/content/climate-change-report-warns-dramatically-warmer-world-century>

<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

<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.

**Table 1: The Long-Term Climate Risk Index (CRI): Results (annual averages) in specific indicators in the 10 countries most affected in 1992 to 2011.**

CRI 1992-2011 (1991-2010)	Country	CRI score	Death toll	Deaths per 100,000 inhabitants	Total losses in million US\$ PPP	Losses per unit GDP in %	Number of Events (total 1992-2011)
1 (3)	Honduras	10.83	329.25	4.96	679	2.84	60
2 (2)	Myanmar	11.00	7,137.25	13.79	640	1.41	37
3 (4)	Nicaragua	18.50	160.0	2.82	223	1.89	44
4 (1)	Bangladesh	20.83	824.4	0.58	1,721	1.18	247
5 (5)	Haiti	21.17	301.1	3.43	148	1.08	54
6 (6)	Viet Nam	23.67	433.15	0.55	1,741	1.06	214
7 (9)	Korea, DPR	26.00	76.65	0.33	3,188	7.64	37
8 (8)	Pakistan	30.50	545.9	0.38	2,183	0.73	141
9 (55)	Thailand	31.17	160.4	0.26	5,413	1.38	182
10 (7)	Dominican Republic	31.33	211.6	2.47	185	0.35	49

There are only slight changes compared to the analyses presented in the CRI 2012 which looked at the period from 1991 to 2010.<sup>6</sup> Nine out of ten countries that made the Down 10 list last year appear again in this year's edition. Of particular note is the rise of Thailand, which suffered through the worst floodings in the countries' history in 2011. In the events triggered by the landfall of tropical storm Nock-ten a total damage of roughly US\$ 43 billion (in nominal values) was amassed, promoting it to the second costliest climate-related disaster after Hurricane Katrina as of 2011.<sup>7</sup>

Furthermore remarkable is that Bangladesh now no longer appears among the three countries most affected. The key reason is that the most devastating event in terms of lives lost took place in 1991, when roughly 140,000 people died. That year has now fallen out of the scope of the analysis. However, it can also be seen as an indication that Bangladesh managed to avoid similarly disastrous events, through investing substantially into its own adaptive capacity and making Bangladesh one of the leaders regarding adaptation to climate change.

Particularly in relative terms, poorer developing countries are hit much harder. These results underscore the particular vulnerability of poor countries to climatic risks, despite the fact that the absolute monetary damages are much higher in richer countries.

<sup>6</sup> see Harmeling, S., 2011: Global Climate Risk Index 2012. <http://germanwatch.org/de/download/2193.pdf>

<sup>7</sup> now surpassed by Hurricane Sandy with over US\$ 50 billion

**Countries most affected in 2011: Thailand, Cambodia and Pakistan** have been identified to be the most affected countries last year, followed by **El Salvador, the Philippines and Brazil**.<sup>8</sup> 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 2011: the 10 most affected countries**

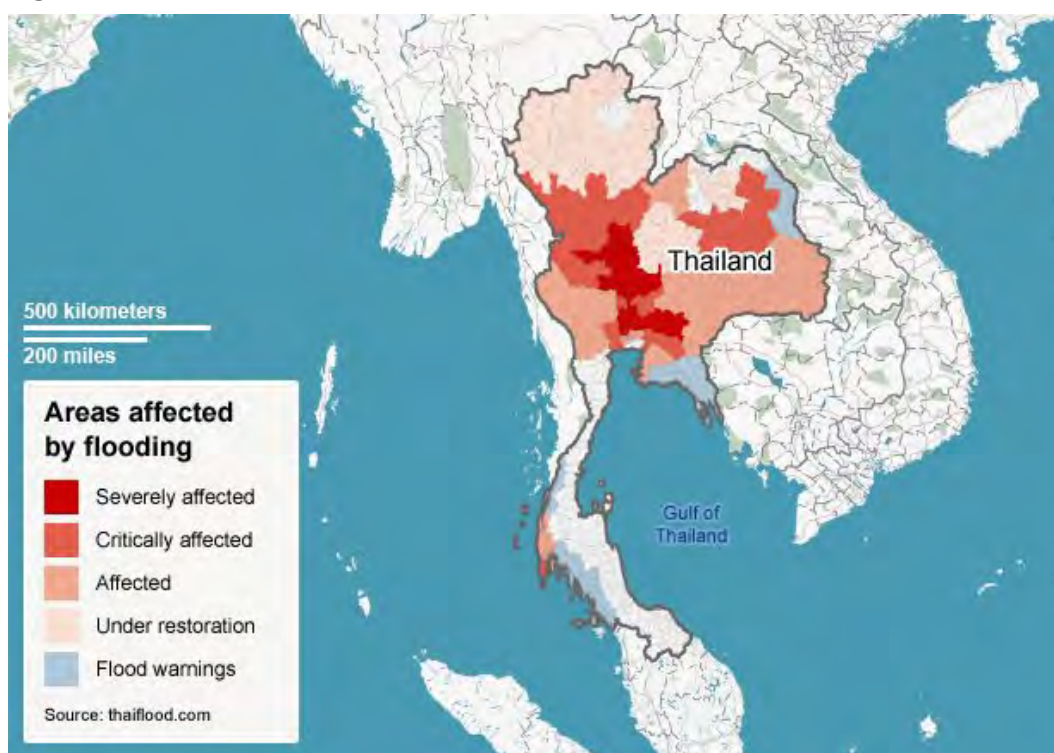
Ranking 2011 (2010)	Country	CRI score	Death toll	Deaths per 100,000 inhabitants	Absolute losses (in million US\$ PPP)	Losses per unit GDP in %	Human Development Index <sup>9</sup>
1 (13)	Thailand	2.50	892	1.39	75,474	12.53	103
2 (39)	Cambodia	7.00	247	1.64	1,049	3.10	139
3 (1)	Pakistan	10.50	585	0.33	5,809	1.19	145
4 (36)	El Salvador	11.83	35	0.59	1,645	3.69	105
5 (14)	Philippines	11.83	1,659	1.73	1,064	0.27	112
6 (23)	Brazil	14.33	1,013	0.52	4,717	0.21	84
7 (30)	United States	15.17	844	0.27	74,791	0.50	4
8 (135)	Lao DPR	15.33	43	0.68	218	1.25	138
9 (2)	Guatemala	16.17	72	0.49	553	0.74	131
10 (49)	Sri Lanka	16.50	106	0.52	602	0.52	97

An exceptional accumulation of very severe natural catastrophes makes 2011 one of the highest-ever loss years on record. The extremely devastating floods in **Thailand** (see Figure 1) account for the countries' rise to the top of this year's Climate Risk Index, killing 892 people and affecting over 13 million lives.

The tough monsoon season in Southeast Asia also caused substantial damage in Thailand's neighbours. In **Cambodia**, the extreme rainfalls resulted in the worst floodings in decades killing about 250 people just as destroying houses and ruining rice crops. The same applies for **Laos**, where 300,000 people in 10 of the countries' 17 provinces were affected by heavy flooding.

<sup>8</sup> The full rankings can be found in the Annexes.

<sup>9</sup> UNDP, 2011: Human Development Report, <http://hdr.undp.org/en/statistics/hdi/>

**Figure 1: Thai floods 2011**

The Philippines, Pakistan and USA have been featured several times in the Down 10 list over the past years. In 2011, **the Philippines** endured a harsh typhoon season and were severely hit by tropical storm Washi which claimed over 1,600 flood victims, topping the list for most human casualties of the year. **Pakistan**, which suffered the worst floodings in the countries' history in 2010, was again struck by a rough monsoon season killing over 500 people. 2011 was also an extreme year for the **United States** as they suffered through a combination of exceptional and severe weather events including a series of devastating tornadoes, record-breaking high temperatures and an intense hurricane season, including Hurricane Irene in August 2011.

**El Salvador** and **Guatemala** have appeared frequently among the most affected countries due to the high exposure to the Atlantic hurricane season. This is also true for 2011 where extensive floods and landslides as a result of hurricanes caused damages to the amount of over US\$ 1 billion in El Salvador, and more than 500 million in Guatemala.

More unusual than the appearance of the countries mentioned before is the presence of Brazil and Sri Lanka in the Down 10 list this year. In the case of **Brazil**, the reason for this year's emergence lie in the worst floods and landslides the country has ever experienced, claiming the lives of over 1,000 people and causing almost US\$ 5 billion of direct losses. Similarly, as for **Sri Lanka**, heavy floodings were accountable for the damages suffered in which 21 % of the country's rice crops were destroyed.<sup>10</sup>

<sup>10</sup> <http://www.guardian.co.uk/world/2011/jan/20/sri-lanka-floods-children-food>



### Science progress in attributing extreme events to climate change?

In recent years thousands of people across the globe had to face severe extreme events, exceptional both with regard to their economic damages and lives lost as well as their meteorological magnitude. While a couple of years ago there was hardly any event where science experts made a clear link to climate change, the research community has progressed. Table 3 provides an overview of record-breaking meteorological events since 2000, and the confidence level that it can be attributed to climate change.

**Table 3: Selection of record-breaking meteorological events since 2000, their societal impacts and confidence level that it can be attributed to climate change**

Region (Year)	Meteorological Record-breaking Event	Confidence in attribution to climate change	Impact, costs
England and Wales (2000)	Wettest autumn on record since 1766. Several short-term rainfall records	Medium	~£1.3 billion
Europe (2003)	Hottest summer in at least 500 years	High	Death toll exceeding 70,000
England and Wales (2007)	May to July wettest since records began in 1766	Medium	Major flooding causing ~£3 billion damage
Southern Europe (2007)	Hottest summer on record in Greece since 1891	Medium	Devastating wildfires
Eastern Mediterranean, Middle-East (2008)	Driest winter since 1902	High	Substantial damage to cereal production
Victoria (Australia) (2009)	Heat wave breaking many station temperature records (32-154 years of data)	Medium	Worst bushfires on record, 173 deaths, 3,500 houses destroyed
Western Russia (2010)	Hottest summer since 1500	Medium	500 wildfires around Moscow, crop failure of ~25 %, death toll ~55,000, ~US\$ 15B economic losses
Pakistan (2010)	Rainfall records	Low to Medium	Worst flooding in its history, nearly 3,000 deaths, affected 20M people.
Eastern Australia (2010)	Highest December rainfall ever recorded since 1900	Low to Medium	Brisbane flooding in Jan 2011, costing 23 lives and estimated US\$ 2.55 billion
Colombia (2010)	Heaviest rains since records started in 1969	Low to Medium	47 deaths, 80 missing

Region (Year)	Meteorological Record-breaking Event	Confidence in attribution to climate change	Impact, costs
Western Amazon (2010)	Drought, record low water level in Rio Negro	Low	Area with significantly increased tree mortality spanning 3.2 million km
Western Europe (2011)	Hottest and driest spring on record in France since 1880	Medium	French grain harvest down by 12 %
Texas, Oklahoma, New Mexico and Louisiana (US) (2011)	Record-breaking summer heat and drought since 1880	High	Wildfires burning 3 million acres (preliminary impact of US\$ 6 to 8 billion)
Continental U.S. (2012)	July warmest month on record since 1895 associated with severe drought conditions	Medium	Abrupt global food price increase due to crop losses

Source: Coumou and Schaeffer, 2012<sup>11</sup> (see also for more detailed references), adapted from Coumou and Rahmstorf, 2012

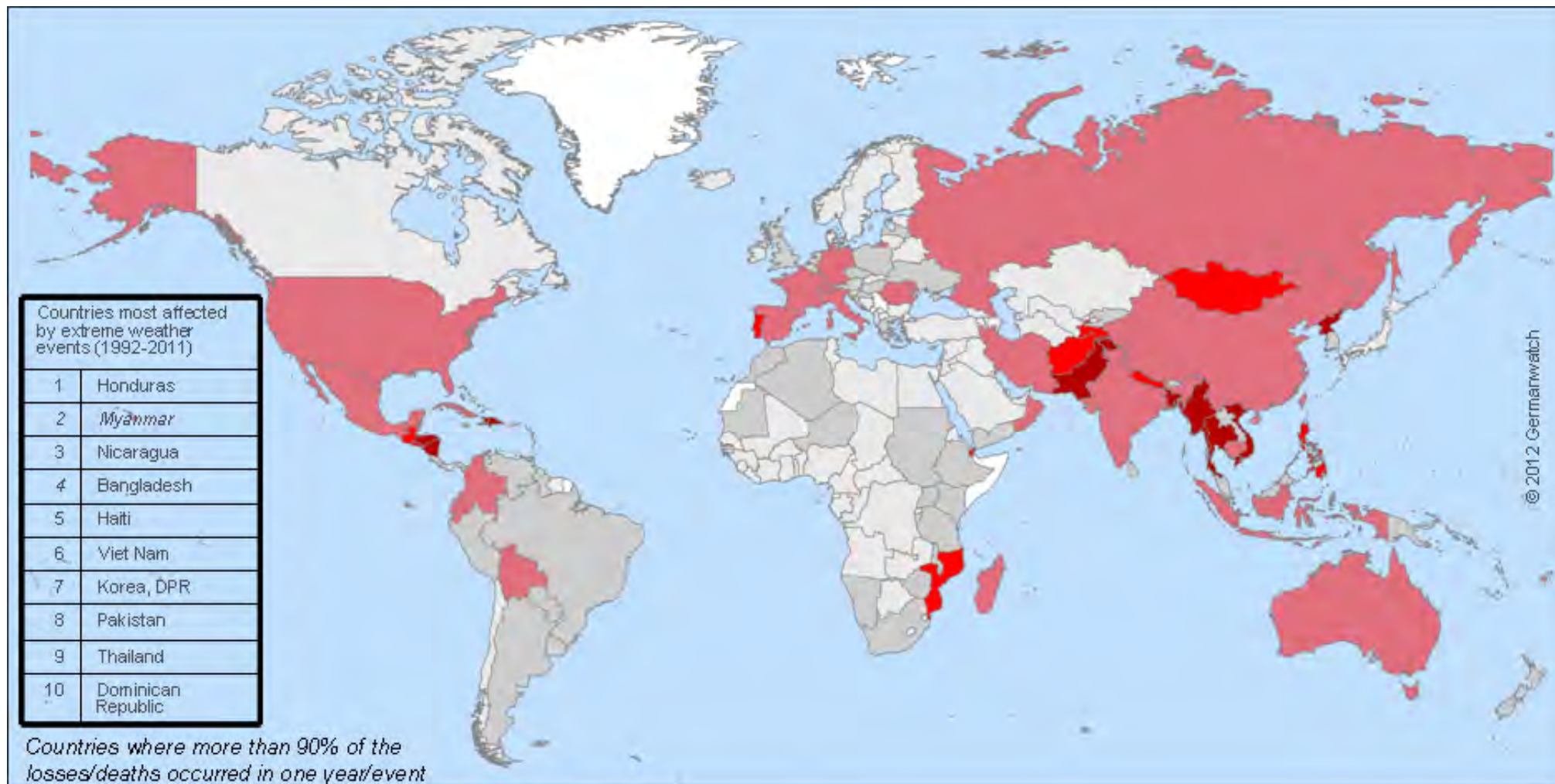
### Exceptional catastrophes or continuous threats?

The Global Climate Risk Index for 1992 to 2011 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. A new addition to this group is Thailand where 87 % of total damage can be accounted to the floodings of 2011.

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 in 2010.

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<sup>11</sup> see Coumou, D. and M. Schaeffer, 2012: Update of climate science relevant for Loss and Damage debate. [www.lossanddamage.net](http://www.lossanddamage.net); table based on Coumou, D. & Rahmstorf, S. A decade of weather extremes. *Nature Climate Change* **2**, 491-496 (2012).



### Climate Risk Index: Ranking 1992 – 2011



**Figure 2: World Map of the Global Climate Risk Index 1992-2011**

Source: Germanwatch and Munich Re NatCatSERVICE

## 2 Impacts on the Middle East

Doha as the host of this year's COP is situated in a region of the world which is not known to be particularly vulnerable to the adverse impacts of climate change – at least not up to this point. Hence, the countries of the Middle East are featured rather low on the Climate Risk Index.

However, this does not mean that the countries are not exposed. Especially slow-onset effects of climate change threaten the Arabian Peninsula. To begin with, an expected decrease in precipitation in combination with a projected temperature rise threatens to further exacerbate the already high level of desertification of the region, increasing the lack of arable land and water resources.<sup>12</sup> Even now, the countries of the Gulf region depend heavily on food imports (up to 90 %) to feed the fast growing population. In addition, they possess the lowest renewable water supplies per capita in the world while still featuring an extremely high consumption rate.<sup>13</sup>

Furthermore, the rising sea levels jeopardize the low-lying coastal zones, e.g. of Bahrain, Qatar and the United Arab Emirates, where much of the countries' industries reside – not to speak of the various artificial islands in the Persian Gulf.<sup>14</sup>

As for future editions of the Climate Risk Index, these aspects are expected to be reflected rather indistinctly in the analyses, however, as it is difficult to assess the indirect impacts of deteriorating food and water security with sufficient reliability within the data that provide the basis for the Climate Risk Index. Nevertheless, Oman (2007 and 2010), Yemen (2008) and Saudi Arabia (2009) appeared in the Down10 list of the CRI in each of the last four years as a result of severe floodings, indicating an increased and accelerating relevance of climate change impacts for the whole region.

Table 4 lists the 10 countries from the region which rank highest in the Climate Risk Index for the period from 1992-2011, Table 5 shows the countries that appear in the CRI for 2011.

In the context of climate change protection, the COP in Doha bears the chance to mark a starting point for countries of the region to embark on a sustainable low-carbon strategy and accepting the responsibility they have, as the generation of fossil fuels provides the foundation of their fast economic growth. Some promising initiatives have been proposed by some high per capita emitters, e.g. Qatar's Vision 2030<sup>15</sup> which entails ambitious environmental management and protection objectives.

<sup>12</sup> see Kumetat (2009): "Climate Change in the Persian Gulf - Regional Security, Sustainability Strategies and Research Needs", Paper presented at International Conference "Climate Change, Social Stress and Violent Conflict" in Hamburg 19/20 November 2009, p. 2

<sup>13</sup> see Sowers and Weinthal (2010): "Climate Change Adaptation in the Middle East and North Africa: Challenges and Opportunities", The Dubai Initiative, Working Paper No. 2, p. 18

<sup>14</sup> Elasha (2010): "Mapping of Climate Change Threats and Human Development Impacts in the Arab Region", Arab Human Development Report, UNDP, p. 24/25

<sup>15</sup> see [http://www.gsdp.gov.qa/portal/page/portal/gsdp\\_en/qatar\\_national\\_vision](http://www.gsdp.gov.qa/portal/page/portal/gsdp_en/qatar_national_vision)

**Table 4: Countries from the Middle East in the CRI 1992-2011**

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
39	<b>Oman</b>	50.83	138	0.28	454.96	0.88	13	89
60	<b>Yemen</b>	64.33	1052	0.28	102.99	0.21	42	154
117	<b>Saudi Arabia</b>	107.33	299	0.07	119.14	0.03	32	56
121	<b>Lebanon</b>	110.50	46	0.06	42.27	0.11	38	71
124	<b>Israel</b>	111.50	87	0.07	73.47	0.05	41	17
130	<b>Jordan</b>	116.67	44	0.04	26.07	0.12	23	95
136	<b>Bahrain</b>	119.17	58	0.40	0.78	0.00	7	42
155	<b>Syria</b>	135.83	35	0.01	37.76	0.05	12	119
161	<b>Kuwait</b>	151.33	21	0.04	0.08	0.00	7	63
163	<b>U. A. E.</b>	152.50	10	0.01	16.12	0.01	12	30

**Table 5: Countries from the Middle East in the CRI 2011**

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
49	<b>Saudi Arabia</b>	49.67	11	0.44	345.56	0.05	2	56
65	<b>Oman</b>	59.50	14	0.45	0.70	0.00	2	89
86	<b>Kuwait</b>	73.50	4	0.11	0.05	0.00	1	63
112	<b>Lebanon</b>	86.83	0	0.00	2.27	0.00	6	71

Moreover, not to be missed in this regard is the project of Masdar City<sup>16</sup> in the United Arab Emirates that could prompt the Gulf state to take a leadership role among the high emitting countries of the region.

Lastly, this year's COP could provide the incentive to promote the research of the broader influence of climate change and the likelihood of extreme events in the Arab region, therefore raising awareness about possible impacts and facilitating adequate policy development.

<sup>16</sup> see <http://www.masdar.ae>

### 3 Loss and Damage Work Programme: Decision Point in Doha

The problem of climate change damages (in the UNFCCC jargon "loss and damage") is being granted increasing weight in the negotiations, in part because climate change mitigation is lagging behind what is required, but also because adaptation action remains insufficient. The loss and damage negotiations in Doha will take place under the impression of recent loss and damage occurred, such as through hurricane Sandy which in addition to the USA also hit hard poorer countries in the region such as Jamaica and Haiti. 2012 has been a year with almost no progress in terms of closing the mitigation ambition gap, but with increasing evidence of climate change and its impacts already experienced today, and potentially occurring in a world several degrees warmer. Loss and damage can also be regarded as a more controversial issue on the adaptation agenda of COP 18 in some regards, although there seems to be consensus that in general the problem is increasingly recognised by all Parties, and also the considerations under the work programme are broadly appreciated.

In 2012, a number of activities have been undertaken under the UNFCCC work programme, including four regional expert meetings (in Africa, Asia, Latin America and for the Small Island Developing States).<sup>17</sup> Based on the information and experience gathered in the expert meetings and through the technical papers and the literature review on a range of approaches to address loss and damage, the SBI is tasked to prepare recommendations to the COP 18, in accordance with decision 1/CP.16 which established the Cancún Adaptation Framework.

The guidance provided by the decision from Durban for this discussion on the one hand stays quite vague, but on the other hand reiterated the guidance provided by the Cancún decision:

"Appreciates the need to explore a range of possible approaches and potential mechanisms, including an international mechanism, to address loss and damage, with a view to making recommendations on loss and damage to the Conference of the Parties for its consideration at its eighteenth session, including elaborating the elements set out in decision 1/CP.16, paragraph 28(a–d);"

Unfortunately, the work programme itself originally foresaw no explicit space to have discussions on this area of work. Obviously, this is particularly important for taking next steps in finding an adequate response to the growing problem of loss and damage. A key basis for the discussions will be the submissions made by Parties in this particular regard. By the time of finalising this report, submissions were available from the group of LDCs, AOSIS, Ghana, the EU, USA and Norway, as well as from a number of international organisations and civil society.

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<sup>17</sup> [http://unfccc.int/adaptation/cancun\\_adaptation\\_framework/loss\\_and\\_damage/items/6056.php](http://unfccc.int/adaptation/cancun_adaptation_framework/loss_and_damage/items/6056.php)

The discussions in Doha should focus on the role of the Convention in addressing loss and damage, taking into account the information gathered in the expert meetings on gaps and needs in developing countries, but in particular the submissions made by Parties.

As previous discussions in the negotiations also on other issues have shown, the general as well as the specific role of the Convention in addressing adaptation and specifically loss and damage needs to be considered. Often Parties refer to the catalytic role of the Convention when addressing climate change related challenges. Some Parties have a more narrow understanding of this term, and others see the catalytic role in a broad range of approaches, including specific technical support to Parties. Generally, the COP of course has the role to provide strategic direction on key issues which then needs to be elaborated by different bodies depending on their mandate.

Both the group of LDCs and AOSIS (and thereby almost 100 Parties), as well as other developing country Parties, have included in their submissions the need to establish an international mechanism on loss and damage in order to establish a leadership role for the Convention and to address the existing gaps. Thereby they also provide their views in line with the mandate of the COP decision from Durban. They regard it as the adequate and necessary response under the UNFCCC to the growing problem of loss and damage given its wide-reaching and at the same time complex and multifaceted nature. It can be expected that the issue of a mechanism will be at the heart of the discussions, and Parties should make substantial progress towards its establishment and adequate design in order to seriously respond to the increasing challenge of loss and damage.

Reflecting previous discussions in the loss and damage negotiations, it is likely that there will be controversial discussions around the issue of a mechanism. In any way this has to be based on the functions emerging from the needs and gaps identified. Looking at the linkages with other institutions is another important aspect to consider.

Finally it will be important to agree on next steps and activities in the work programme: Reflecting the decision from Cancún, an end date for the work programme has not been defined, so one expectation is that there will be discussions about the future scope of the work programme, its potential length and activities in the work programme. This may include activities under other work streams.

## 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 unstable 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 2013 is based on the loss-figures from 2011 and 1992-2011. 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 6: Climate Risk Index for 1992-2011**

(Avg. = average figure for the 20-year period. Example: 39 people died in Albania due to extreme weather events in 1992-2011, hence the average death toll per year was 1.95.)

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
144	<b>Albania</b>	124.00	1.95	130	0.06	114	11.90	140	0.07	123
98	<b>Algeria</b>	91.67	71.95	37	0.23	68	61.41	91	0.03	143
118	<b>Angola</b>	107.67	26.20	66	0.17	75	17.09	128	0.02	151
34	<b>Antigua and Barbuda</b>	48.33	1.00	141	1.37	14	39.44	105	3.31	8
90	<b>Argentina</b>	85.50	26.50	65	0.07	110	553.68	32	0.13	98
146	<b>Armenia</b>	127.17	0.40	153	0.01	157	30.35	116	0.15	90
43	<b>Australia</b>	53.83	46.75	49	0.24	66	1,747.79	12	0.27	65
57	<b>Austria</b>	63.17	29.90	64	0.37	50	381.42	35	0.15	90
143	<b>Azerbaijan</b>	121.67	2.10	127	0.03	141	65.83	87	0.09	117
136	<b>Bahrain</b>	119.17	2.90	119	0.40	46	0.78	166	0.00	169
4	<b>Bangladesh</b>	20.83	824.40	7	0.58	31	1,721.08	14	1.18	21
145	<b>Barbados</b>	124.67	0.05	170	0.02	153	12.09	138	0.26	67
150	<b>Belarus</b>	128.50	4.20	109	0.04	128	26.04	120	0.03	143
71	<b>Belgium</b>	72.33	86.00	31	0.83	20	87.52	77	0.03	143
26	<b>Belize</b>	44.33	2.40	122	0.90	19	57.87	92	3.44	7
149	<b>Benin</b>	128.17	3.80	113	0.05	121	4.82	154	0.05	130
89	<b>Bhutan</b>	85.00	2.30	123	0.38	47	4.84	153	0.23	70
35	<b>Bolivia</b>	48.83	41.05	56	0.47	40	139.91	63	0.44	47
116	<b>Bosnia and Herzegovina</b>	107.00	0.35	155	0.01	157	97.23	73	0.38	50
138	<b>Botswana</b>	119.33	1.50	135	0.09	96	10.20	141	0.06	124
80	<b>Brazil</b>	80.17	164.70	20	0.09	96	979.70	21	0.06	124
171	<b>Brunei Darussalam</b>	159.00	0.10	165	0.03	141	0.31	169	0.00	169
102	<b>Bulgaria</b>	93.00	5.15	100	0.06	114	147.23	62	0.17	84
104	<b>Burkina Faso</b>	93.67	5.55	99	0.05	121	40.36	103	0.31	59
125	<b>Burundi</b>	111.67	1.70	133	0.02	153	11.99	139	0.46	46
28	<b>Cambodia</b>	44.50	45.10	51	0.35	52	154.05	58	0.95	27
146	<b>Cameroon</b>	127.17	6.10	95	0.04	128	13.35	136	0.04	138
109	<b>Canada</b>	99.17	12.20	76	0.04	128	847.79	25	0.08	119
133	<b>Cape Verde</b>	118.33	0.15	162	0.03	141	3.75	156	0.33	55
168	<b>Central African Republic</b>	155.50	0.90	143	0.02	153	0.33	168	0.01	158
111	<b>Chad</b>	100.83	2.90	119	0.04	128	37.80	108	0.30	61
115	<b>Chile</b>	104.33	8.50	85	0.05	121	148.40	61	0.08	119
23	<b>China</b>	41.67	1,855.45	4	0.15	80	27,806.89	2	0.54	42
44	<b>Chinese Taipei</b>	56.33	75.00	36	0.34	54	839.17	26	0.17	84
47	<b>Colombia</b>	57.17	107.85	26	0.26	63	591.60	31	0.19	80
179	<b>Comoros</b>	170.83	0.00	172	0.00	168	0.00	179	0.00	169
72	<b>Costa Rica</b>	72.50	9.95	81	0.23	68	80.18	80	0.24	69
158	<b>Cote d'Ivoire</b>	140.17	4.40	105	0.03	141	4.90	152	0.02	151

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
62	Croatia	66.33	34.75	58	0.78	22	68.76	84	0.11	106
48	Cuba	58.50	6.95	91	0.06	114	2,048.98	10	2.55	11
93	Cyprus	89.67	3.60	114	0.50	37	16.33	132	0.10	109
75	Czech Re- public	75.67	8.00	88	0.08	103	593.53	30	0.27	65
157	Democratic Republic of Congo	138.83	15.15	71	0.03	141	1.07	164	0.01	158
175	Democratic Republic of Timor-Leste	165.33	0.10	165	0.01	157	0.07	175	0.00	169
128	Denmark	114.33	0.80	147	0.01	157	246.00	45	0.15	90
19	Djibouti	38.83	8.75	84	1.28	15	41.44	101	2.90	9
53	Dominica	60.83	0.25	158	0.35	52	49.62	95	7.41	4
10	Dominican Republic	31.33	211.60	19	2.47	5	185.25	53	0.35	53
29	Ecuador	45.00	63.60	41	0.49	38	271.49	43	0.33	55
136	Egypt	119.17	42.10	54	0.06	114	29.50	117	0.01	158
15	El Salvador	35.83	33.75	60	0.61	28	295.32	41	0.91	29
179	Equatorial Guinea	170.83	0.00	172	0.00	168	0.00	179	0.00	169
120	Eritrea	109.33	0.15	162	0.00	168	36.81	110	1.06	24
151	Estonia	129.33	0.40	153	0.03	141	22.15	123	0.10	109
83	Ethiopia	81.83	91.25	28	0.13	85	54.40	93	0.12	100
32	Fiji	47.33	5.95	96	0.72	23	40.34	104	1.30	19
165	Finland	153.67	0.20	160	0.00	168	21.96	124	0.02	151
105	Former Yugo- slav Republic of Macedonia	95.17	0.85	146	0.04	128	75.65	81	0.49	44
25	France	43.50	965.65	6	1.61	11	1,666.72	15	0.10	109
177	Gabon	170.50	0.00	172	0.00	168	0.04	177	0.00	169
101	Georgia	92.17	3.90	112	0.09	96	39.09	107	0.22	71
37	Germany	49.83	476.70	12	0.58	31	2,289.96	7	0.10	109
123	Ghana	111.33	17.30	70	0.09	96	16.63	130	0.04	138
91	Greece	85.83	13.40	73	0.12	90	252.39	44	0.10	109
17	Grenada	36.33	2.00	128	1.97	8	97.98	72	9.54	1
11	Guatemala	32.33	82.65	34	0.72	23	318.76	38	0.62	38
160	Guinea	142.50	1.25	138	0.01	157	4.64	155	0.06	124
134	Guinea-Bissau	118.67	0.10	165	0.01	157	7.48	147	0.52	43
97	Guyana	91.33	0.30	156	0.04	128	47.39	96	1.25	20
5	Haiti	21.17	301.10	15	3.43	3	148.68	60	1.08	23
1	Honduras	10.83	329.25	14	4.96	2	679.92	27	2.84	10
179	Hong Kong SAR	170.83	0.00	172	0.00	168	0.00	179	0.00	169
65	Hungary	69.17	33.95	59	0.33	55	206.16	50	0.13	98
119	Iceland	108.17	1.80	131	0.62	27	1.40	162	0.02	151
22	India	41.17	3,204.35	2	0.31	59	6,458.83	3	0.29	62
50	Indonesia	59.50	252.70	18	0.12	90	1,596.97	17	0.22	71
167	Iraq	154.83	0.90	143	0.00	168	15.70	134	0.01	158
138	Ireland	119.33	2.00	128	0.05	121	66.33	86	0.05	130
18	Islamic Re- public of Af-	38.33	277.45	17	1.03	18	84.02	79	0.40	49

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
	Afghanistan									
41	Islamic Re- public of Iran	52.33	86.50	30	0.13	85	2,220.23	8	0.35	53
124	Israel	111.50	4.35	107	0.07	110	73.47	82	0.05	130
24	Italy	43.17	1,003.65	5	1.73	9	1,565.14	18	0.10	109
51	Jamaica	60.67	4.70	104	0.18	73	178.78	54	0.88	30
102	Japan	93.00	67.35	40	0.05	121	1,649.36	16	0.05	130
130	Jordan	116.67	2.20	125	0.04	128	26.07	119	0.12	100
134	Kazakhstan	118.67	12.55	75	0.08	103	35.07	115	0.01	158
81	Kenya	81.67	41.65	55	0.13	85	68.75	85	0.15	90
113	Kiribati	103.00	0.00	172	0.00	168	39.25	106	8.49	2
7	Korea, DPR	26.00	76.65	35	0.33	55	3,188.58	5	7.64	3
59	Korea, Re- public	64.17	87.15	29	0.19	72	1,250.68	20	0.14	96
161	Kuwait	151.33	1.05	140	0.04	128	0.08	174	0.00	169
76	Kyrgyz Re- public	76.67	19.20	69	0.38	47	16.69	129	0.17	84
68	Lao People's Democratic Republic	71.33	4.80	102	0.09	96	84.27	78	0.92	28
84	Latvia	82.17	4.00	110	0.17	75	70.02	83	0.21	75
121	Lebanon	110.50	2.30	123	0.06	114	42.27	100	0.11	106
126	Lesotho	114.17	0.25	158	0.01	157	13.59	135	0.58	39
173	Liberia	159.50	0.30	156	0.01	157	0.19	171	0.01	158
174	Libya	162.50	0.00	172	0.00	168	6.49	151	0.01	158
142	Lithuania	121.50	2.60	121	0.08	103	21.46	126	0.04	138
106	Luxembourg	98.50	6.50	93	1.45	12	2.79	158	0.01	158
30	Madagascar	45.33	70.80	38	0.42	44	90.55	74	0.63	36
96	Malawi	91.17	5.05	101	0.04	128	40.37	102	0.49	44
88	Malaysia	83.83	43.80	52	0.18	73	163.09	57	0.06	124
178	Maldives	170.67	0.00	172	0.00	168	0.01	178	0.00	169
121	Mali	110.50	3.10	117	0.03	141	22.78	122	0.22	71
169	Malta	156.83	0.00	172	0.00	168	2.92	157	0.04	138
74	Mauritania	75.33	3.95	111	0.15	80	35.45	113	0.75	34
114	Mauritius	103.83	0.55	151	0.05	121	35.71	112	0.31	59
48	Mexico	58.50	143.00	23	0.14	83	2,391.96	6	0.20	78
45	Moldova	56.67	5.85	97	0.15	80	178.28	55	1.96	14
12	Mongolia	32.83	12.85	74	0.52	36	315.74	39	4.11	6
92	Morocco	88.50	31.35	61	0.11	95	112.25	68	0.11	106
20	Mozambique	41.00	85.80	32	0.47	40	100.33	70	0.87	32
2	Myanmar	11.00	7,137.25	1	13.79	1	640.58	29	1.41	17
63	Namibia	66.83	11.25	78	0.61	28	21.73	125	0.22	71
16	Nepal	36.17	282.90	16	1.13	17	98.03	71	0.41	48
73	Netherlands	74.67	84.70	33	0.53	35	152.24	59	0.03	143
81	New Zealand	81.67	3.60	114	0.09	96	228.33	48	0.25	68
3	Nicaragua	18.50	160.00	22	2.82	4	223.12	49	1.89	16
79	Niger	79.83	7.50	89	0.07	110	45.59	98	0.63	36
129	Nigeria	116.17	54.60	45	0.04	128	52.25	94	0.02	151
153	Norway	131.83	1.55	134	0.03	141	62.54	89	0.03	143
39	Oman	50.83	6.90	92	0.28	60	454.96	33	0.88	30

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
8	<b>Pakistan</b>	30.50	545.90	10	0.38	47	2,183.10	9	0.73	35
108	<b>Panama</b>	98.83	9.55	82	0.32	57	13.30	137	0.05	130
55	<b>Papua New Guinea</b>	62.00	24.15	67	0.45	42	35.88	111	0.33	55
56	<b>Paraguay</b>	62.17	6.45	94	0.12	90	234.66	47	1.00	26
58	<b>Peru</b>	63.50	94.25	27	0.36	51	190.80	52	0.12	100
14	<b>Philippines</b>	35.17	576.20	9	0.72	23	655.78	28	0.28	64
66	<b>Poland</b>	69.67	46.50	50	0.12	90	883.92	24	0.18	82
20	<b>Portugal</b>	41.00	142.75	24	1.38	13	374.46	36	0.19	80
179	<b>Qatar</b>	170.83	0.00	172	0.00	168	0.00	179	0.00	169
141	<b>Republic of Congo</b>	120.00	8.05	86	0.26	63	0.28	170	0.00	169
60	<b>Republic of Yemen</b>	64.33	52.60	47	0.28	60	102.99	69	0.21	75
38	<b>Romania</b>	50.50	53.35	46	0.24	66	900.57	23	0.37	51
26	<b>Russia</b>	44.33	2,929.55	3	2.02	7	1,942.79	11	0.08	119
111	<b>Rwanda</b>	100.83	7.10	90	0.09	96	9.82	143	0.15	90
170	<b>Samoa</b>	157.17	0.05	170	0.03	141	0.07	175	0.01	158
179	<b>Sao Tome and Principe</b>	170.83	0.00	172	0.00	168	0.00	179	0.00	169
117	<b>Saudi Arabia</b>	107.33	14.95	72	0.07	110	119.14	66	0.03	143
154	<b>Senegal</b>	133.83	3.55	116	0.03	141	7.86	145	0.05	130
132	<b>Serbia. Monte- negro. Kosovo</b>	118.00	0.70	149	0.01	157	129.19	65	0.15	90
164	<b>Seychelles</b>	153.50	0.00	172	0.00	168	0.79	165	0.06	124
131	<b>Sierra Leone</b>	117.50	8.05	86	0.17	75	0.59	167	0.02	151
176	<b>Singapore</b>	166.33	0.10	165	0.00	168	2.49	159	0.00	169
110	<b>Slovak Re- public</b>	100.67	4.40	105	0.08	103	90.27	75	0.10	109
63	<b>Slovenia</b>	66.83	12.05	77	0.60	30	64.04	88	0.16	88
42	<b>Solomon Is- lands</b>	53.17	10.75	79	2.44	6	6.64	150	0.58	39
87	<b>South Africa</b>	83.67	61.45	42	0.14	83	238.93	46	0.06	124
32	<b>Spain</b>	47.33	705.10	8	1.69	10	947.79	22	0.09	117
70	<b>Sri Lanka</b>	72.00	38.90	57	0.21	70	112.61	67	0.17	84
54	<b>St. Kitts and Nevis</b>	61.67	0.20	160	0.43	43	35.17	114	5.32	5
46	<b>St. Lucia</b>	56.83	1.00	141	0.64	26	26.94	118	1.90	15
69	<b>St. Vincent and the Grenadines</b>	71.67	0.60	150	0.56	33	7.26	148	0.84	33
86	<b>Sudan</b>	83.17	42.30	53	0.13	85	88.10	76	0.12	100
171	<b>Suriname</b>	159.00	0.15	162	0.03	141	0.15	172	0.00	169
100	<b>Swaziland</b>	92.00	0.90	143	0.08	103	24.82	121	0.55	41
148	<b>Sweden</b>	127.67	1.35	136	0.02	153	136.73	64	0.05	130
36	<b>Switzerland</b>	49.33	60.30	44	0.82	21	395.61	34	0.16	88
155	<b>Syrian Arab Republic</b>	135.83	1.75	132	0.01	157	37.76	109	0.05	130
13	<b>Tajikistan</b>	34.50	31.30	63	0.48	39	283.87	42	2.29	12
98	<b>Tanzania</b>	91.67	21.95	68	0.06	114	61.87	90	0.18	82
9	<b>Thailand</b>	31.17	160.40	21	0.26	63	5,413.27	4	1.38	18
40	<b>The Bahamas</b>	51.17	1.30	137	0.42	44	177.21	56	2.26	13

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
78	The Gambia	78.67	4.30	108	0.32	57	7.65	146	0.36	52
156	Togo	138.33	2.20	125	0.04	128	1.15	163	0.03	143
51	Tonga	60.67	1.15	139	1.15	16	6.94	149	1.17	22
159	Trinidad and Tobago	142.00	0.75	148	0.06	114	2.31	160	0.01	158
162	Tunisia	151.67	3.00	118	0.03	141	0.15	172	0.00	169
106	Turkey	98.50	51.85	48	0.08	103	202.86	51	0.03	143
166	Turkmenistan	154.33	0.00	172	0.00	168	10.01	142	0.04	138
85	Uganda	82.33	31.35	61	0.12	90	46.23	97	0.20	78
77	Ukraine	78.50	60.95	43	0.13	85	303.76	40	0.10	109
163	United Arab Emirates	152.50	0.50	152	0.01	157	16.12	133	0.01	158
67	United Kingdom	70.67	117.45	25	0.20	71	1390.78	19	0.08	119
30	United States	45.33	478.05	11	0.17	75	35,013.23	1	0.33	55
94	Uruguay	89.83	5.70	98	0.17	75	43.54	99	0.14	96
152	Uzbekistan	130.33	10.30	80	0.04	128	8.41	144	0.02	151
140	Vanuatu	119.67	0.10	165	0.05	121	1.67	161	0.21	75
61	Venezuela	66.00	69.25	39	0.28	60	359.81	37	0.12	100
6	Vietnam	23.67	433.15	13	0.55	34	1,741.95	13	1.06	24
126	Zambia	114.17	4.80	102	0.04	128	17.53	127	0.12	100
95	Zimbabwe	90.67	9.25	83	0.08	103	16.58	131	0.29	62

Table 7: Climate Risk Index 2011

Rank CRI 2011	Country	Overall CRI Score	Death Toll		Deaths per 100,000 inhabitants		Losses in million US\$ PPP		Losses per unit GDP in %	
			Total	Rank	Total	Rank	Total	Rank	Total	Rank
129	Albania	93.33	0	88	0.00	84	0.02	126	0.00	89
44	Algeria	44.67	35	30	0.10	39	106.80	52	0.04	54
38	Angola	42.67	153	15	0.78	6	6.47	77	0.01	76
131	Antigua and Barbuda	94.17	0	88	0.00	84	0.00	131	0.00	89
40	Argentina	43.33	5	60	0.01	77	3,941.90	8	0.55	19
122	Armenia	91.83	0	88	0.00	84	0.18	117	0.00	89
13	Australia	23.50	32	33	0.14	30	4,695.67	6	0.51	21
92	Austria	77.67	2	74	0.02	71	16.12	72	0.00	89
113	Azerbaijan	87.83	0	88	0.00	84	1.44	93	0.00	89
131	Bahrain	94.17	0	88	0.00	84	0.00	131	0.00	89
52	Bangladesh	50.83	160	14	0.11	37	29.75	65	0.01	76
131	Barbados	94.17	0	88	0.00	84	0.00	131	0.00	89
119	Belarus	90.00	0	88	0.00	84	0.64	106	0.00	89
53	Belgium	51.67	5	60	0.05	50	169.18	42	0.04	54
112	Belize	87.33	0	88	0.00	84	0.19	116	0.01	76
105	Benin	84.67	0	88	0.00	84	1.01	100	0.01	76
131	Bhutan	94.17	0	88	0.00	84	0.00	131	0.00	89
19	Bolivia	31.33	101	19	0.95	5	32.52	63	0.06	48

Rank CRI 2011	Country	Overall CRI Score	Death Toll		Deaths per 100.000 inhabitants		Losses in million US\$ PPP		Losses per unit GDP in %	
			Total	Rank	Total	Rank	Total	Rank	Total	Rank
49	Bosnia and Herzegovina	49.67	0	88	0.00	84	479.57	26	1.52	8
131	Botswana	94.17	0	88	0.00	84	0.00	131	0.00	89
6	Brazil	14.33	1013	3	0.52	11	4,717.36	5	0.21	28
131	Brunei Darussalam	94.17	0	88	0.00	84	0.00	131	0.00	89
64	Bulgaria	59.00	1	80	0.01	77	125.67	48	0.12	36
58	Burkina Faso	56.00	0	88	0.00	84	130.02	46	0.59	17
61	Burundi	57.67	19	42	0.22	22	0.57	108	0.01	76
2	Cambodia	7.00	247	9	1.64	3	1,049.46	17	3.10	5
66	Cameroon	60.17	0	88	0.00	84	107.32	51	0.23	27
32	Canada	39.00	13	47	0.04	58	2,456.73	11	0.18	30
131	Cape Verde	94.17	0	88	0.00	84	0.00	131	0.00	89
108	Central African Republic	86.33	0	88	0.00	84	0.41	110	0.01	76
59	Chad	56.17	0	88	0.00	84	125.59	49	0.64	16
33	Chile	39.33	9	54	0.05	50	546.51	22	0.18	30
20	China	31.50	624	6	0.05	50	12,828.11	3	0.11	40
75	Chinese Taipei	67.83	1	80	0.00	84	281.70	31	0.03	64
21	Colombia	33.50	277	8	0.60	9	129.63	47	0.03	64
131	Comoros	94.17	0	88	0.00	84	0.00	131	0.00	89
131	Cook Islands	94.17	0	88	0.00	84	0.00	131	0.00	89
35	Costa Rica	40.33	4	64	0.09	41	134.38	44	0.24	26
131	Cote d'Ivoire	94.17	0	88	0.00	84	0.00	131	0.00	89
125	Croatia	92.17	0	88	0.00	84	0.13	119	0.00	89
131	Cyprus	94.17	0	88	0.00	84	0.00	131	0.00	89
130	Czech Republic	93.83	0	88	0.00	84	0.01	129	0.00	89
92	Democratic Republic of Congo	77.67	16	45	0.02	71	0.98	101	0.00	89
131	Democratic Republic of Timor-Leste	94.17	0	88	0.00	84	0.00	131	0.00	89
55	Denmark	53.67	0	88	0.00	84	931.02	18	0.45	24
131	Djibouti	94.17	0	88	0.00	84	0.00	131	0.00	89
106	Dominica	85.17	0	88	0.00	84	0.21	115	0.02	70
23	Dominican Republic	35.67	12	49	0.12	34	189.34	39	0.20	29
87	Ecuador	74.67	7	57	0.05	50	0.29	113	0.00	89
131	Egypt	94.17	0	88	0.00	84	0.00	131	0.00	89
4	El Salvador	11.83	35	30	0.59	10	1,645.05	13	3.69	4
131	Equatorial Guinea	94.17	0	88	0.00	84	0.00	131	0.00	89
131	Eritrea	94.17	0	88	0.00	84	0.00	131	0.00	89
100	Estonia	82.00	0	88	0.00	84	3.07	84	0.01	76
123	Ethiopia	92.00	0	88	0.00	84	0.15	118	0.00	89
131	Fiji	94.17	0	88	0.00	84	0.00	131	0.00	89
61	Finland	57.67	1	80	0.02	71	184.76	40	0.10	42
131	Former Yugoslav Republic of Macedonia	94.17	0	88	0.00	84	0.00	131	0.00	89
54	France	53.50	8	56	0.01	77	1,422.45	15	0.06	48



Rank CRI 2011	Country	Overall CRI Score	Death Toll		Deaths per 100.000 inhabitants		Losses in million US\$ PPP		Losses per unit GDP in %	
			Total	Rank	Total	Rank	Total	Rank	Total	Rank
128	<b>Gabon</b>	93.00	0	88	0.00	84	0.08	124	0.00	89
44	<b>Georgia</b>	44.67	7	57	0.16	25	18.82	69	0.08	46
46	<b>Germany</b>	47.33	27	36	0.03	66	1,642.33	14	0.05	51
43	<b>Ghana</b>	44.17	23	40	0.09	41	69.17	57	0.09	43
118	<b>Greece</b>	89.67	1	80	0.01	77	0.02	126	0.00	89
131	<b>Grenada</b>	94.17	0	88	0.00	84	0.00	131	0.00	89
9	<b>Guatemala</b>	16.17	72	22	0.49	13	553.83	21	0.74	14
98	<b>Guinea</b>	80.67	0	88	0.00	84	2.00	88	0.02	70
131	<b>Guinea-Bissau</b>	94.17	0	88	0.00	84	0.00	131	0.00	89
101	<b>Guyana</b>	82.33	0	88	0.00	84	1.14	98	0.02	70
37	<b>Haiti</b>	42.00	33	32	0.33	16	4.69	80	0.04	54
11	<b>Honduras</b>	19.00	30	34	0.37	15	414.01	28	1.16	11
131	<b>Hong Kong SAR</b>	94.17	0	88	0.00	84	0.00	131	0.00	89
80	<b>Hungary</b>	69.83	0	88	0.00	84	83.66	55	0.04	54
131	<b>Iceland</b>	94.17	0	88	0.00	84	0.00	131	0.00	89
17	<b>India</b>	27.17	1399	2	0.12	34	3,948.09	7	0.09	43
61	<b>Indonesia</b>	57.67	89	20	0.04	58	65.00	58	0.01	76
131	<b>Iraq</b>	94.17	0	88	0.00	84	0.00	131	0.00	89
47	<b>Ireland</b>	48.83	2	74	0.04	58	237.65	33	0.13	35
26	<b>Islamic Republic of Afghanistan</b>	36.83	10	52	0.03	66	508.38	23	1.71	7
82	<b>Islamic Republic of Iran</b>	70.67	26	38	0.03	66	7.70	76	0.00	89
131	<b>Israel</b>	94.17	0	88	0.00	84	0.00	131	0.00	89
41	<b>Italy</b>	43.67	28	35	0.05	50	765.53	19	0.04	54
84	<b>Jamaica</b>	72.83	1	80	0.04	58	1.70	89	0.01	76
29	<b>Japan</b>	38.00	105	18	0.08	45	1,988.58	12	0.04	54
131	<b>Jordan</b>	94.17	0	88	0.00	84	0.00	131	0.00	89
103	<b>Kazakhstan</b>	83.50	2	74	0.01	77	1.16	95	0.00	89
69	<b>Kenya</b>	61.17	41	26	0.10	39	2.99	85	0.00	89
131	<b>Kiribati</b>	94.17	0	88	0.00	84	0.00	131	0.00	89
27	<b>Korea. Republic</b>	37.33	82	21	0.16	25	481.03	25	0.03	64
86	<b>Kuwait</b>	73.50	4	64	0.11	37	0.05	125	0.00	89
94	<b>Kyrgyz Republic</b>	77.83	3	70	0.05	50	0.13	119	0.00	89
8	<b>Lao People's Democratic Republic</b>	15.33	43	25	0.68	7	218.18	35	1.25	9
131	<b>Latvia</b>	94.17	0	88	0.00	84	0.00	131	0.00	89
111	<b>Lebanon</b>	86.83	0	88	0.00	84	2.27	87	0.00	89
131	<b>Lesotho</b>	94.17	0	88	0.00	84	0.00	131	0.00	89
131	<b>Liberia</b>	94.17	0	88	0.00	84	0.00	131	0.00	89
131	<b>Libya</b>	94.17	0	88	0.00	84	0.00	131	0.00	89
117	<b>Lithuania</b>	89.50	0	88	0.00	84	0.87	103	0.00	89
131	<b>Luxembourg</b>	94.17	0	88	0.00	84	0.00	131	0.00	89
22	<b>Madagascar</b>	35.50	38	27	0.17	24	25.22	66	0.12	36
79	<b>Malawi</b>	69.17	5	60	0.03	66	3.43	83	0.02	70
66	<b>Malaysia</b>	60.17	37	29	0.13	32	1.56	90	0.00	89
131	<b>Maldives</b>	94.17	0	88	0.00	84	0.00	131	0.00	89
56	<b>Mali</b>	53.83	1	80	0.01	77	102.67	53	0.57	18

Rank CRI 2011	Country	Overall CRI Score	Death Toll		Deaths per 100.000 inhabitants		Losses in million US\$ PPP		Losses per unit GDP in %	
			Total	Rank	Total	Rank	Total	Rank	Total	Rank
126	Malta	92.67	0	88	0.00	84	0.12	122	0.00	89
48	Mauritania	49.00	0	88	0.00	84	264.40	32	3.72	3
127	Mauritius	92.83	0	88	0.00	84	0.09	123	0.00	89
16	Mexico	25.50	146	16	0.13	32	2,852.51	9	0.17	32
131	Moldova	94.17	0	88	0.00	84	0.00	131	0.00	89
131	Mongolia	94.17	0	88	0.00	84	0.00	131	0.00	89
123	Morocco	92.00	1	80	0.00	84	0.02	126	0.00	89
131	Mozambique	94.17	0	88	0.00	84	0.00	131	0.00	89
24	Myanmar	36.00	164	12	0.26	20	39.46	62	0.05	51
18	Namibia	27.50	65	23	3.04	1	19.07	68	0.12	36
29	Nepal	38.00	191	10	0.63	8	10.92	74	0.03	64
116	Netherlands	89.33	0	88	0.00	84	0.96	102	0.00	89
57	New Zealand	55.00	3	70	0.07	46	46.76	60	0.04	54
14	Nicaragua	24.83	17	44	0.29	18	142.44	43	0.75	13
27	Niger	37.33	9	54	0.06	48	117.83	50	1.01	12
29	Nigeria	38.00	188	11	0.12	34	182.66	41	0.04	54
34	Norway	39.50	7	57	0.14	30	230.04	34	0.09	43
65	Oman	59.50	14	46	0.45	14	0.70	105	0.00	89
3	Pakistan	10.50	585	7	0.33	16	5,809.60	4	1.19	10
99	Panama	80.83	1	80	0.03	66	1.16	95	0.00	89
90	Papua New Guinea	76.17	4	64	0.06	48	0.13	119	0.00	89
12	Paraguay	20.00	10	52	0.15	27	2,542.15	10	6.25	2
59	Peru	56.17	27	36	0.09	41	21.39	67	0.01	76
4	Philippines	11.83	1659	1	1.73	2	1,064.35	16	0.27	25
96	Poland	79.17	4	64	0.01	77	4.74	79	0.00	89
120	Portugal	90.17	0	88	0.00	84	0.63	107	0.00	89
131	Qatar	94.17	0	88	0.00	84	0.00	131	0.00	89
97	Republic of Congo	80.17	2	74	0.05	50	0.01	129	0.00	89
131	Republic of Yemen	94.17	0	88	0.00	84	0.00	131	0.00	89
85	Romania	73.00	0	88	0.00	84	92.94	54	0.03	64
95	Russia	78.33	5	60	0.00	84	30.63	64	0.00	89
121	Rwanda	90.50	0	88	0.00	84	0.43	109	0.00	89
131	Samoa	94.17	0	88	0.00	84	0.00	131	0.00	89
131	Sao Tome and Principe	94.17	0	88	0.00	84	0.00	131	0.00	89
49	Saudi Arabia	49.67	11	50	0.04	58	345.56	30	0.05	51
131	Senegal	94.17	0	88	0.00	84	0.00	131	0.00	89
36	Serbia. Montenegro. Kosovo	41.00	4	64	0.04	58	500.20	24	0.51	21
131	Seychelles	94.17	0	88	0.00	84	0.00	131	0.00	89
131	Sierra Leone	94.17	0	88	0.00	84	0.00	131	0.00	89
114	Singapore	88.00	0	88	0.00	84	1.36	94	0.00	89
107	Slovak Republic	86.00	0	88	0.00	84	3.63	82	0.00	89
115	Slovenia	88.17	0	88	0.00	84	1.16	95	0.00	89
131	Solomon Islands	94.17	0	88	0.00	84	0.00	131	0.00	89
72	South Africa	64.50	26	38	0.05	50	16.80	71	0.00	89

Rank CRI 2011	Country	Overall CRI Score	Death Toll		Deaths per 100.000 inhabitants		Losses in million US\$ PPP		Losses per unit GDP in %	
			Total	Rank	Total	Rank	Total	Rank	Total	Rank
70	<b>Spain</b>	63.50	11	50	0.02	71	203.10	37	0.01	76
10	<b>Sri Lanka</b>	16.50	106	17	0.52	11	602.71	20	0.52	20
131	<b>St. Kitts and Nevis</b>	94.17	0	88	0.00	84	0.00	131	0.00	89
131	<b>St. Lucia</b>	94.17	0	88	0.00	84	0.00	131	0.00	89
81	<b>St. Vincent and the Grenadines</b>	70.00	0	88	0.00	84	1.47	92	0.12	36
109	<b>Sudan</b>	86.67	0	88	0.00	84	2.37	86	0.00	89
131	<b>Suriname</b>	94.17	0	88	0.00	84	0.00	131	0.00	89
131	<b>Swaziland</b>	94.17	0	88	0.00	84	0.00	131	0.00	89
89	<b>Sweden</b>	75.33	0	88	0.00	84	78.11	56	0.02	70
25	<b>Switzerland</b>	36.33	19	42	0.24	21	195.18	38	0.06	48
131	<b>Syrian Arab Republic</b>	94.17	0	88	0.00	84	0.00	131	0.00	89
83	<b>Tajikistan</b>	71.50	3	70	0.04	58	1.49	91	0.01	76
42	<b>Tanzania</b>	44.00	38	27	0.09	41	44.27	61	0.07	47
1	<b>Thailand</b>	2.50	892	4	1.39	4	75,474.21	1	12.53	1
51	<b>The Bahamas</b>	50.67	0	88	0.00	84	204.08	36	1.93	6
109	<b>The Gambia</b>	86.67	0	88	0.00	84	0.36	112	0.01	76
131	<b>Togo</b>	94.17	0	88	0.00	84	0.00	131	0.00	89
68	<b>Tonga</b>	60.67	0	88	0.00	84	5.21	78	0.68	15
77	<b>Trinidad and Tobago</b>	68.33	2	74	0.15	27	0.73	104	0.00	89
90	<b>Tunisia</b>	76.17	4	64	0.04	58	1.13	99	0.00	89
87	<b>Turkey</b>	74.67	13	47	0.02	71	4.44	81	0.00	89
131	<b>Turkmenistan</b>	94.17	0	88	0.00	84	0.00	131	0.00	89
38	<b>Uganda</b>	42.67	51	24	0.15	27	18.40	70	0.04	54
76	<b>Ukraine</b>	68.17	0	88	0.00	84	132.55	45	0.04	54
131	<b>United Arab Emirates</b>	94.17	0	88	0.00	84	0.00	131	0.00	89
78	<b>United Kingdom</b>	68.50	2	74	0.00	84	408.72	29	0.02	70
7	<b>United States</b>	15.17	844	5	0.27	19	74,791.05	2	0.50	23
73	<b>Uruguay</b>	65.83	0	88	0.00	84	57.11	59	0.11	40
131	<b>Uzbekistan</b>	94.17	0	88	0.00	84	0.00	131	0.00	89
102	<b>Vanuatu</b>	82.50	0	88	0.00	84	0.39	111	0.03	64
71	<b>Venezuela</b>	64.00	21	41	0.07	46	13.00	73	0.00	89
15	<b>Vietnam</b>	25.33	161	13	0.18	23	454.41	27	0.15	33
104	<b>Zambia</b>	84.00	3	70	0.02	71	0.25	114	0.00	89
74	<b>Zimbabwe</b>	66.17	0	88	0.00	84	9.45	75	0.15	33

## Germanwatch

Following the motto "Observing, Analysing, Acting", Germanwatch has been actively promoting global 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 food security, responsible financial markets, compliance with human rights, and the prevention of dangerous climate change.

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