

## FACT SHEET **WORLDRISKREPORT 2012**

### What is the WorldRiskReport 2012?

The WorldRiskReport (WRR) consists of an index, a priority topic and case studies. The index describes the disaster risk for various countries and regions. The main focus of the report is on the threat from or exposure to natural hazards and the rise in sea level caused by climate change, as well as social vulnerability in the form of the population's susceptibility and their capacity for coping and adaptation. An additional priority topic in the 2012 report is "environmental degradation and disasters".

### What is particular about the WorldRiskReport?

– The WorldRiskReport was developed in close cooperation between scientists and practitioners. Combined expertise, i.e. scientific structure and procedure and practical competence distinguish this report from comparable academic studies.

–The scheme of four components was first drawn up worldwide in the WorldRiskReport 2011. The global overview which this gives is novel in nature. In addition, the combination of the social and economic dimensions of risk with the traditional risk analysis for serious natural disasters leads to a new approach for risk assessment which permits future-oriented conclusions for policy and practice. Out of 28 indicators of the WorldRiskIndex, 26 indicators were updated for the WorldRiskReport 2012.

–The significant differences between exposure to natural hazards on the one hand and social vulnerability on the other hand point to the urgent need to create closer links between disaster relief, disaster risk reduction and development strategies and policies. Earthquakes cannot be prevented, but vulnerability to them can be reduced.

– Previous studies focused primarily on the analysis of different natural hazards and aimed at mapping risk and vulnerability on a global level. They were often focused primarily on issues such as the number of fatalities caused by the various disasters and the size of the resulting economic losses. In contrast, besides hazard analysis, the WorldRiskIndex gives priority primarily to the vulnerability of the population, i.e. their susceptibility, their coping capacity and their ability to adapt to future natural hazard events and the consequences of climate change. The WorldRiskIndex is thus based on conceptual frameworks that aim towards an integrative and holistic risk assessment. It underscores the social construction of risk.

– The distinction between coping and adaptation capacity also demonstrates that the capacity to cope with an actual hazard requires different resources and characteristics than long-term adaptation.



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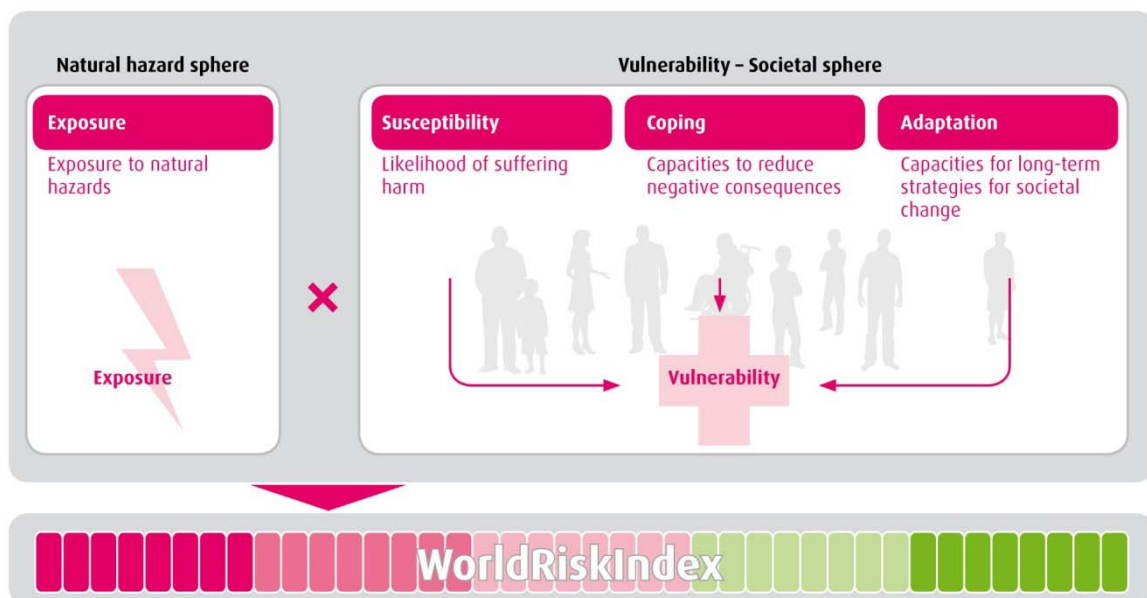
## How is the WorldRiskIndex conceptualized?

The concept of the WorldRiskIndex (WRI) is based on the understanding of risk from research on natural hazards and disasters. In this context risk is defined as an interaction between a natural hazard and the vulnerability of societies. Vulnerability includes social conditions and processes that are reflected in susceptibility, coping capacity and adaptive capacity. While adaptation refers primarily to the society's long-term strategies for change, coping refers to the immediate response to ongoing natural hazard processes. Unlike similar studies that assume that a natural hazard or climate change affect a well-ordered society, the WRI takes into account that not only the natural hazard but also the social, economic and environmental factors which characterize a society – as well as governance aspects – are crucial in determining whether a natural hazard or natural event (floods, earthquakes, storms) can turn into a disaster.

The index is composed of indicators which are divided into four components and further sub-categories:

- + *Exposure*: exposure to natural hazards such as earthquakes, hurricanes, floods, droughts and rising sea levels
- + *Susceptibility* in relation to infrastructure, nutrition, housing situation and economic conditions
- + *Coping capacity* in relation to governance, precautions and early warning systems, medical services, social and material protection
- + *Adaptation capacity* in relation to future natural events and climate change.

The overall index is calculated by combining the four components, each of which includes several sub-categories. The index value is calculated by combining the exposure to natural hazards with the vulnerability of a society, i.e. their susceptibility and their capacities for coping and adaptation.



A more detailed diagram for calculating the WorldRiskIndex is given on pages 12/13 of the WorldRiskReport 2012.>>[www.worldRiskReport.en/download](http://www.worldRiskReport.en/download)

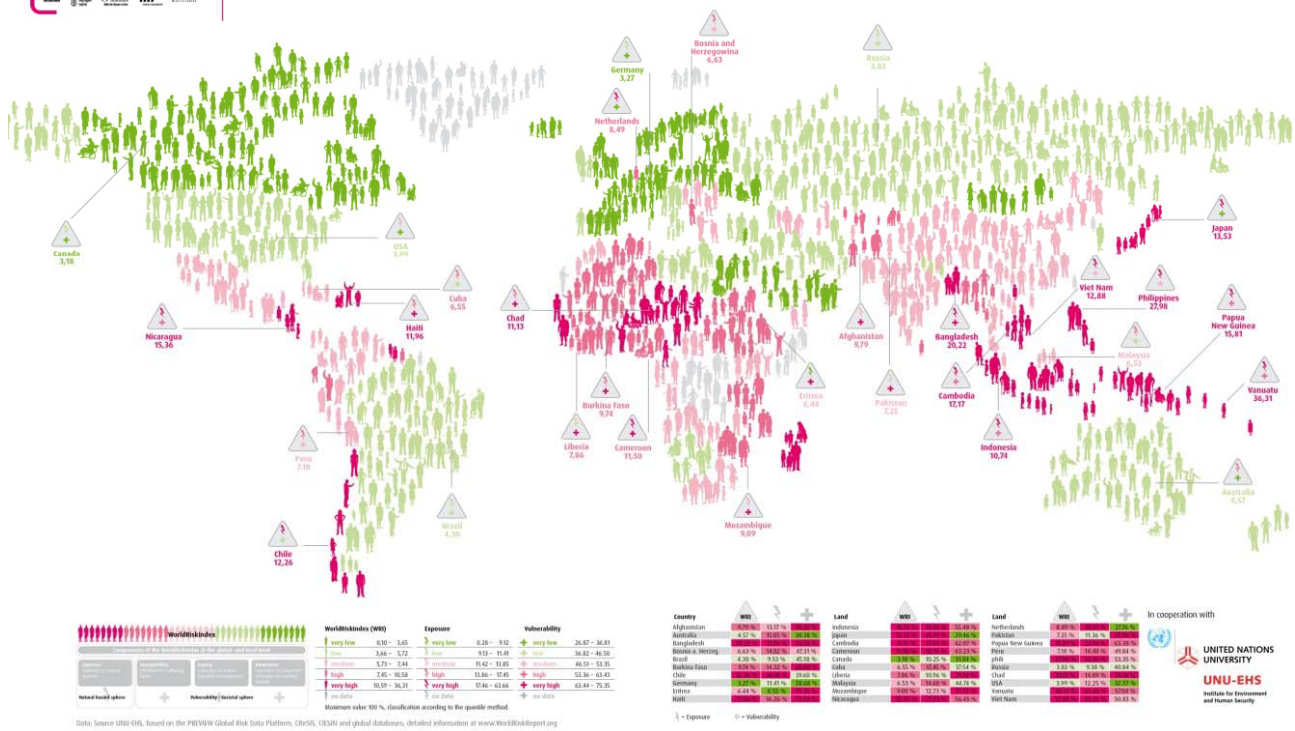
## What is new about the WorldRiskIndex 2012?

The WorldRiskReport 2012 contains new data on exposure to the rise in sea level based on more precise population data amongst other aspects. For example, it shows a significant increase in the threat to Bangladesh which ranked 15 in the 2011 exposure index and is now in 10<sup>th</sup> place in the new index – in other words, is under a much higher exposure than previously assessed.

In addition, the index has changed in the environmental indicator section, due to changes in the underlying data and input indicators. This means that the results of the 2011 and 2012 indices are not directly comparable. In an overall context, the risk and vulnerability structures which became clear in the 2011 report can be confirmed, for example the global risk hotspots in Oceania, Southeast Asia, in the southern Sahel and in Central America.

## What is the current overall view of the global situation?

Rank	Country	WorldRiskIndex	Exposure	Vulnerability	Susceptibility	Lack of coping capacities	Lack of adaptive capacities
1.	Vanuatu	36.31 %	63.66 %	57.04 %	34.17 %	81.19 %	55.78 %
2.	Tonga	28.62 %	55.27 %	51.78 %	27.91 %	81.31 %	46.11 %
3.	Philippines	27.98 %	52.46 %	53.35 %	33.92 %	83.09 %	43.03 %
4.	Guatemala	20.75 %	36.30 %	57.16 %	37.28 %	81.18 %	53.04 %
5.	Bangladesh	20.22 %	31.70 %	63.78 %	43.47 %	86.84 %	61.03 %
6.	Solomon Islands	18.15 %	29.98 %	60.55 %	43.96 %	84.26 %	53.42 %
7.	Costa Rica	17.38 %	42.61 %	40.80 %	21.59 %	65.63 %	35.19 %
8.	Cambodia	17.17 %	27.65 %	62.07 %	45.93 %	86.68 %	53.61 %
9.	Timor-Leste	17.13 %	25.73 %	66.59 %	52.88 %	87.58 %	59.32 %
10.	El Salvador	16.89 %	32.60 %	51.82 %	28.92 %	76.71 %	49.82 %
11.	Brunei Darussalam	15.92 %	41.10 %	38.72 %	14.57 %	65.66 %	35.94 %
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84.	Georgia	6.75 %	14.69 %	45.94 %	24.17 %	65.46 %	48.18 %
85.	Central African Republic	6.64 %	9.39 %	70.69 %	61.52 %	89.44 %	61.12 %
86.	Bosnia and Herzegovina	6.63 %	14.02 %	47.31 %	19.47 %	73.88 %	48.58 %
87.	Belize	6.63 %	13.31 %	49.81 %	28.16 %	74.31 %	46.94 %
88.	Angola	6.56 %	10.18 %	64.45 %	56.15 %	85.28 %	51.91 %
89.	Cuba	6.55 %	17.45 %	37.54 %	19.20 %	58.95 %	34.48 %
90.	Turkmenistan	6.55 %	13.19 %	49.65 %	24.02 %	76.23 %	48.71 %
91.	Malaysia	6.53 %	14.60 %	44.74 %	20.87 %	70.30 %	43.04 %
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163.	Finland	2.24 %	8.19 %	27.41 %	14.62 %	37.81 %	29.79 %
164.	Sweden	2.15 %	7.97 %	27.01 %	14.32 %	36.85 %	29.86 %
165.	United Arab Emirates	2.07 %	5.93 %	34.84 %	10.54 %	56.36 %	37.61 %
166.	Bahrain	1.81 %	4.27 %	42.44 %	13.55 %	64.19 %	49.57 %
167.	Kiribati	1.78 %	3.05 %	58.32 %	42.22 %	82.43 %	50.31 %
168.	Iceland	1.53 %	5.67 %	26.98 %	14.34 %	39.16 %	27.45 %
169.	Grenada	1.46 %	3.13 %	46.64 %	25.32 %	69.89 %	44.70 %
170.	Saudi Arabia	1.31 %	2.93 %	44.53 %	17.93 %	70.89 %	44.78 %
171.	Barbados	1.15 %	3.46 %	33.08 %	15.36 %	48.53 %	35.36 %
172.	Malta	0.61 %	1.65 %	36.81 %	14.29 %	53.52 %	42.62 %
173.	Qatar	0.10 %	0.28 %	36.18 %	9.61 %	55.40 %	43.54 %



**New Zealand vs. Haiti: a comparison of disasters**

While the earthquake on 22 March 2011 in Christchurch in New Zealand with a moment magnitude of 6.3 claimed the lives of 187 victims and caused losses amounting to 16 billion US dollars, an earthquake in Haiti at the beginning of 2010 with a strength of 7 led to 220,000 casualties and to losses of around 8 billion US dollars. In Haiti it was not only the number of people killed which was higher: although the economic losses in Haiti were only half those in New Zealand in absolute terms, they were far more devastating. Whilst in New Zealand 80 per cent of the losses were insured, in Haiti the loss exceeded the country's gross national product and only 2.5 per cent of the total loss was insured. The disaster risk of the two countries is reflected in the WorldRiskIndex with a value of 11.96 per cent, Haiti falls in the highest risk class ranking 21 out of 173 countries, whereas New Zealand occupies place 122 at 4.44 per cent. This difference is due to New Zealand's lower vulnerability (vulnerability: 28.77 per cent; for Haiti: 73.54 per cent) because the figures for exposure to natural risks are almost the same for both countries (Haiti: 16.26 per cent, rank 40 in the exposure index; New Zealand: 15.44 per cent, rank 49 in the exposure index).

## What is the situation for the EU-27 (plus Norway, Iceland and Switzerland)?

Rank	Country	WorldRiskIndex	Exposure	Vulnerability	Susceptibility	Lack of coping capacities	Lack of adaptive capacities
51.	Netherlands	8.49 %	30.57 %	27.76 %	13.89 %	39.14 %	30.26 %
72.	Greece	7.35 %	21.11 %	34.83 %	16.55 %	52.27 %	35.67 %
82.	Romania	6.78 %	15.77 %	42.99 %	22.06 %	63.95 %	42.95 %
102.	Hungary	5.87 %	15.61 %	37.61 %	16.18 %	55.28 %	41.38 %
116.	Italy	4.82 %	13.85 %	34.78 %	16.05 %	54.84 %	33.44 %
118.	Bulgaria	4.56 %	11.66 %	39.11 %	16.90 %	59.31 %	41.11 %
120.	Ireland	4.50 %	14.74 %	30.54 %	14.98 %	42.26 %	34.38 %
131.	Portugal	3.82 %	10.93 %	34.99 %	17.15 %	48.80 %	39.01 %
132.	Slovenia	3.81 %	11.59 %	32.86 %	14.23 %	51.36 %	33.00 %
135.	Austria	3.75 %	13.60 %	27.54 %	13.63 %	35.75 %	33.25 %
137.	Slovakia	3.69 %	10.21 %	36.13 %	13.82 %	56.98 %	37.58 %
138.	Czech Republic	3.67 %	10.82 %	33.96 %	14.33 %	51.85 %	35.71 %
139.	United Kingdom	3.65 %	11.60 %	31.49 %	15.53 %	46.40 %	32.53 %
140.	Poland	3.53 %	9.79 %	36.05 %	17.23 %	55.45 %	35.48 %
141.	Latvia	3.51 %	9.26 %	37.94 %	20.98 %	58.05 %	34.81 %
142.	Belgium	3.48 %	11.66 %	29.88 %	14.91 %	42.89 %	31.84 %
143.	Spain	3.40 %	10.23 %	33.28 %	15.07 %	50.87 %	33.91 %
146.	Germany	3.27 %	11.41 %	28.68 %	14.63 %	38.59 %	32.82 %
148.	Lithuania	3.23 %	8.88 %	36.40 %	20.39 %	53.17 %	35.64 %
151.	Denmark	3.09 %	10.87 %	28.42 %	14.30 %	39.09 %	31.89 %
152.	Cyprus	2.81 %	7.44 %	37.72 %	14.00 %	57.99 %	41.17 %
153.	France	2.78 %	9.25 %	30.05 %	15.39 %	42.25 %	32.50 %
155.	Luxembourg	2.65 %	9.12 %	29.11 %	11.59 %	40.51 %	35.22 %
157.	Switzerland	2.59 %	9.56 %	27.14 %	13.99 %	36.93 %	30.51 %
159.	Estonia	2.50 %	7.23 %	34.62 %	17.83 %	52.12 %	33.90 %
162.	Norway	2.31 %	8.58 %	26.87 %	13.75 %	37.98 %	28.87 %
163.	Finland	2.24 %	8.19 %	27.41 %	14.62 %	37.81 %	29.79 %
164.	Sweden	2.15 %	7.97 %	27.01 %	14.32 %	36.85 %	29.86 %
168.	Iceland	1.53 %	5.67 %	26.98 %	14.34 %	39.16 %	27.45 %
172.	Malta	0.61 %	1.65 %	36.81 %	14.29 %	53.52 %	42.62 %

## Why is an instrument such as the WorldRiskIndex needed?

+ It is widely accepted in the scientific community that the climate is changing to an unprecedented unknown degree and that this will have consequences for humanity which cannot currently be predicted precisely. This applies to both the developed countries and to developing and newly-industrialized ones. According to the most recent scientific findings, e.g. the sea level will rise between 90 and 160 cm by 2100. This will create serious problems for countries such as Bangladesh, the island states in Oceania and the Netherlands (Arctic Monitoring and Assessment Programme in Norway <http://www.amap.no>).

+ It is obvious that we need to prepare now for changes in the environment which can be expected in the coming years and decades. It is not only gradual environmental changes which play a crucial role, but also the change in what are known as extreme events and in the development of social vulnerability. Political decision makers and development cooperation stakeholders are in need of instruments which indicate which regions and countries show particularly high risks as far as the effects of these extreme events are concerned due to their exposure and vulnerability. However, information on the threat is insufficient on its own. What is of equal importance is to have an overall understanding of the situation in terms of the society's constitution and its coping capacity for dealing with events of this kind. This is where the WorldRiskIndex is of use, in that it presents the threat to the different countries on the one hand and the vulnerability of their societies on the other in a quick, clear and deliberately striking manner so that important differences and risk hotspots become apparent.

+ Thanks to its methodology and the resulting data, the WorldRiskReport highlights aspects such as risk reduction, protection of highly vulnerable groups and risk management and thus aims at a shift from a mostly short-term view of disasters to a development approach.

+ The Alliance Development Works requires acceptance of the follow-up agreement for the Hyogo disaster prevention programme and that its strategies for reducing disaster risks are made an integral part of the new post-2015 development agenda and climate talks. Four general aims in line with the four components of the WorldRiskIndex should apply to this international negotiation process:

**1. To reduce the risk due to extreme natural events:**

In order to remedy the causes of the increasing disaster risks, effective measures are required to control climate change and to counter the degradation of soils and vegetation.

**2. To decrease structural susceptibility:**

This primarily requires an improvement in the social and economic living conditions of the vulnerable groups in the population, including the fight against poverty and hunger and the reduction in income inequalities.

**3. To increase the capacity to cope with disasters:**

This includes improving public institutions, expanding social security systems and the development of disaster risk management and early warning systems.

**4. To improve measures to adapt to disaster risks:**

These include investment in more robust infrastructures and ecosystems and the improvement of education and research plus equal participation in political decision-making processes by those exposed to disasters.

**Which data were used for compiling the results?**

The WorldRiskIndex is based on freely accessible data which meet certain standards and quality criteria. The raw data of all the selected indicators were taken from various global databases and converted into dimensionless values between 0 and 1 (or between 0 and 100 per cent) for subsequent aggregation.

The most frequent natural hazards occurring between 1970 and 2005 (74 per cent of all natural hazards) and causing the highest number of deaths (88 per cent) were selected.

Consideration was also given to the issue of globally rising sea levels in order to take account of the threat to coastal areas and the people living there in the context of climate change. Currently, about 13 per cent of the world's population lives in coastal areas that are less than ten meters above sea level.

Other data sets used were from the following institutions:

- + International Disaster Database, Leuven/Belgium (frequency of natural hazards, number of deaths)
- + University of Kansas, Center for Remote Sensing of Ice Sheets
- + Columbia University, Center for International Earth Science Information Network
- + Global Risk Data Platform PREVIEW (earthquakes, hurricanes, floods and droughts).

### **What can the WorldRiskIndex achieve and what are its limitations?**

- + The advantage of an index is the considerable simplification of complex facts to give an overall value which illustrates the existing problem at a glance. Indices are therefore a valuable tool for communication and public relations. In addition they can highlight problems profiles and form part of a preliminary basis for decision-making processes.
- + Nevertheless, the informative value of indices has significant limitations. Indicators or the indices compiled from them are theoretical concepts using dummy variables for certain phenomena. They can therefore never reflect reality perfectly.
- + The global WorldRiskIndex is dependent on data availability and data quality. There were adequate data for calculating an index value for 173 out of 193 countries.

### **What are the results of the priority topic of “environmental degradation and disasters”?**

A degraded environment makes a significant contribution to increasing the disaster risk. The role of ecosystems and the connection between the degradation of the environment and the increase in disasters associated with this were clearly demonstrated as early as 2005 in the Millennium Ecosystem Assessment (MA) using the example of floods and forest fires. This UN study also showed that 60 per cent of the ecosystems studied were not used in a sustainable way or are in a condition of ongoing degradation (MA 2005). The UN Global Assessment Report on Disaster Risk Reduction 2009 identifies environmental degradation or the loss of ecosystems as a fundamental driving force which increases the risk of a disaster.

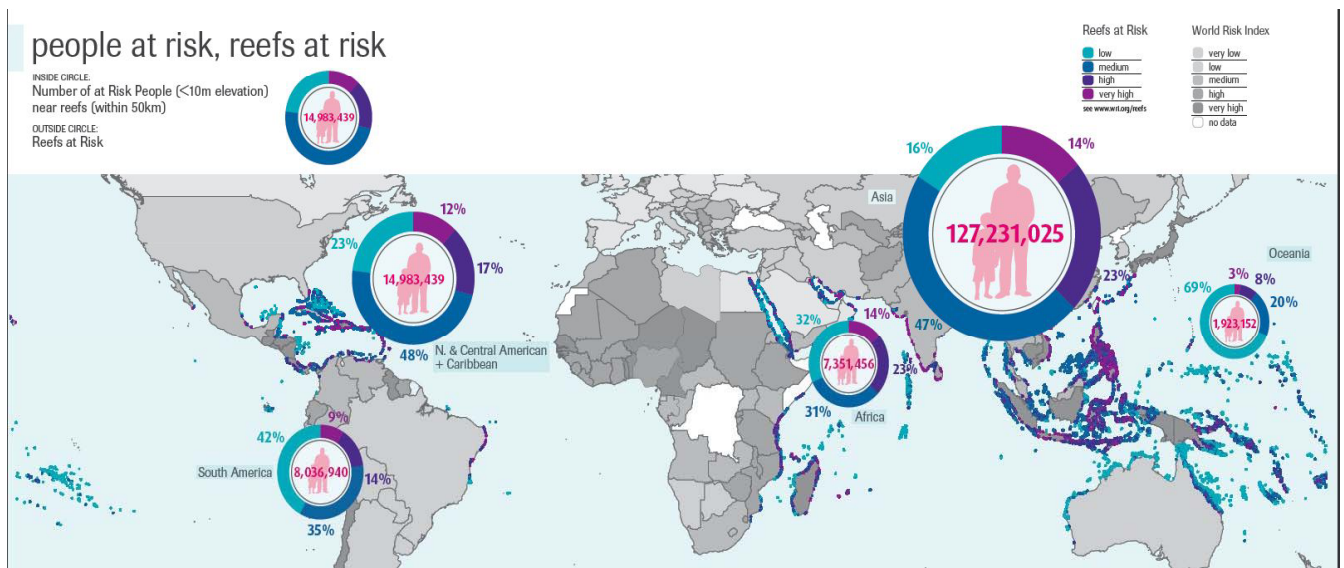
The priority chapter of the WorldRiskReport 2012 produced jointly with the international environmental organization The Nature Conservancy (TNC) focuses in particular on ecosystems such as reefs and mangroves which reduce risks from coastal hazards (coastal storms and floods).

Two large-sized world maps in the WorldRiskReport illustrate the role of coastal habitats and reefs in risk reduction. They show where very large numbers of people benefit and where the benefits from coral reef ecosystems are most at risk of environmental degradation.

The maps and data used are available at [www.network.coastalresilience.org](http://www.network.coastalresilience.org)

### **How many people can benefit from the protection of coastal habitats?**

- + These are the 200 million people living at low elevations near the coast who may receive some direct and indirect benefits from coral reefs alone. For example, reefs can absorb more than 85 per cent of the wave energy which otherwise would impact coasts and provides benefits for fisheries and livelihoods. From the perspective of risk reduction, many of the most at-risk countries are tropical and coastal, which is where reefs are most abundant.
- + Storms and other coastal hazards are causing more costly damage to people and property than ever before. Natural hazards like coastal storms, erosion and floods create huge risks for people. Those risks increase with climate change and poor coastal development decisions.



### I have heard that Coral Reefs are going extinct anyway – why should we invest in their conservation and restoration?

- + Coral reefs are in better shape currently than most coastal habitats – better condition than oyster reefs, marshes, mangroves, and kelp forests.
- + In many regions, coral reefs have rebounded after impacts from sea water warming.
- + Coral restoration is entirely feasible.
- + There is evidence that corals can evolve to be more heat tolerant.
- + Some of the most critical benefits from coral reefs are their coastal protection benefits. These are benefits that will not disappear quickly. The structure (limestone skeleton) of coral reefs is not lost even when the living skin temporarily dies (from bleaching, pollution or storms). This gives extraordinary opportunity for restoration.

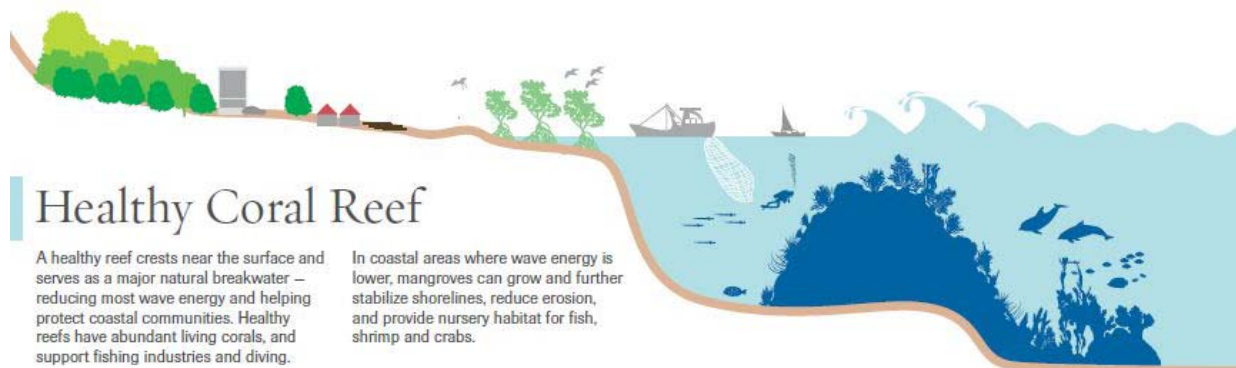
### What could be the solution?

- + Natural systems are some of the most cost effective coastal defenses. This report illustrates the powerful role that nature can play in reducing risks.
- + Coral reefs, oyster reefs and mangroves offer flexible, cost-effective and sustainable coastal defense – breaking wave energy – as well as other benefits like healthy fisheries and tourism that sea walls and breakwaters will never provide.
- + For example, TNC does oyster reef restoration for coastal defense at ~\$US 1 million/mile in the Gulf of Mexico. This is comparable to or cheaper than “gray” breakwater costs – and before consideration of benefits to fisheries, and recreation.
- + This report spotlights those areas – like the Indo West Pacific and the Caribbean – where conserving and restoring these natural systems can benefit the most people.



## How should habitats be protected or restored in order to avoid the risks which threaten human beings?

- + Social and environmental risks often overlap. This knowledge is essential in order to be properly informed about how and where there is a need for action.
- + We have to make sure we don't just keep building artificial infrastructure at the peril of our natural defenses. Nature is a critical part of the solution.
- + Decisions and investments for coastal protection are being made today.
- + Development and conservation do not have to be incompatible; the concept of risk reduction can bridge environmental, social, and economic goals.
- + We have the opportunity to ensure that government agencies and engineers use "green infrastructure" solutions where they can have strong and cost-effective impact.
- + Governments, nationally and multi-nationally, must identify where coastal habitats are viable solutions for risk reduction and place priority on their conservation & restoration.
- + Development organizations and environmental groups can work together to meet joint goals in sustainable development, risk reduction and conservation.
- + Environmental agencies and organizations should focus more on vulnerable people; working less often remotely & more often where habitats like reefs are close to people.



## Where should habitats be protected or restored in order to avoid the risks which threaten human beings?

+ The countries in Oceania in the western Pacific have the highest proportion of people living in low-lying areas (less than ten meters above sea level) and in the vicinity of reefs (within 50 kilometer) :28 per cent of the total population. Fortunately these are the areas where the reefs are in the best condition from a global viewpoint: 69 per cent of the reefs have a low risk of damage and where we should focus reef conservation efforts.

+ In absolute numbers, Southeast Asia – with a focus in Indonesia –has the largest number of people in low-lying at-risk areas close to reefs: 127 million. Reefs are in very poor condition here with 37 per cent being subject to a high or very high risk. Here, reef recovery and restoration would benefit many people.

+ Conservation organizations need to change the focus of their efforts to protect reefs are directed to those close to human beings and not simply to remote and "unspoilt" areas.

### What is The Nature Conservancy's role:

+ "The Nature Conservancy is leading the way in showing that nature can get the job done."

+ The Conservancy works globally on coral reefs. TNC and partners lead workshops for reef managers around the world. At the heart of these trainings is understanding Reef Resilience and helping managers to implement reef solutions. Further The Conservancy is actively working on coral reef restoration in the US and Caribbean.

+ "Environmental Conservation" and "Disaster Risk Reduction" are strongly linked; but traditionally these linkages have been described *qualitatively*.

+ The Conservancy is leading the way in actually *quantifying* how natural infrastructure contributes to disaster risk reduction and making these linkages in science and policy.

+ Most importantly we are leading the way in testing these solutions in the water- for example with oyster reefs in the Gulf of Mexico.

+ The Conservancy is partnering with Aid Groups and United Nations University (UNU) to understand and reduce joint risks to people and nature.

+ The Conservancy is working with governments and international institutions to ensure that green infrastructure solutions are used to reduce the impacts of climate change.

+ We are working in the Caribbean, the Gulf of Mexico, the Solomon Islands and other places around the world to demonstrate that green infrastructure works.

### The Project Partners

The **United Nations University (UNU)** is the academic arm of the United Nations. Through a problem-oriented and interdisciplinary approach, it aims at applied research and education on a global scale. UNU was founded in 1973 as an autonomous organ of the United Nations General Assembly. The University has its headquarters in Tokyo, Japan, and over a dozen institutes and programmes worldwide. UNU-EHS was established in 2003 in Bonn, Germany.

[www.ehs.unu.edu](http://www.ehs.unu.edu);

The **Alliance Development Works/Bündnis Entwicklung hilft** is an alliance of German development and relief agencies providing long-term aid in the aftermath of major disasters and in emergencies. The association brings together larger and smaller, church and non-church development and relief agencies along with their respective specialties'. Partners are Bread for the World, medico international, MISEREOR, Terre des Hommes Germany and German Agro Action. [www.entwicklung-hilft.de/English.57.0.html](http://www.entwicklung-hilft.de/English.57.0.html)

**The Nature Conservancy** is a leading conservation organization working around the world to protect ecologically important lands and waters for nature and people. The Conservancy and its more than 1 million members have protected nearly 120 million acres worldwide .[www.nature.org](http://www.nature.org)