Coasts – Places of high (and increasing) risk

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No other region is threatened more by natural perils than coasts. The fiercest winds over land usually occur where storms make landfall. Where wind-driven water masses meet land, they rise to storm-surge levels. Large waves and tsunamis expend their energy when they reach the coastline. Additionally, a coast often represents the boundary between continental plates, making earthquakes and volcanic eruptions more frequent and likely. The implications of a changing climate are probably more important for coasts than for anywhere else – with the main threat being sea level rise.

Despite these hazards, people are attracted to coasts. Here, economic conditions are better and many other quality-of-life aspects more favourable than elsewhere. Besides residents, tourists make up a large proportion of the population in many places. Most global trade crosses the oceans. Ports are the entry and exit points of a nation’s trade. Industrial and commercial companies prefer to be close to ports and transport their raw materials and goods over shorter distances. As a consequence, some coastal regions rank among the top places in the world in terms of population and value accumulation.

In the same way as a catastrophe can happen only when a natural event hits a populated, little prepared region, risk is the result of a natural hazard, the values at risk and their vulnerability. All three components have been and still are increasing unabated, especially along the world’s coastlines. Losses from natural disasters here have been increasing and already reached new dimensions. In the past decade, huge disasters such as the Indian Ocean tsunami (2004), Hurricane Katrina (US Gulf Coast 2005), cyclone Nargis (Myanmar 2008), and the Chile and Haiti earthquakes (2010) have happened.

The only way to contain the mounting risk is by controlling settlement in high-hazard areas. Nevertheless, coasts will continue to attract people, businesses and industries. We also have to accept that climate change is a fact, and will increasingly make the situation worse. Accordingly, coastal risk reduction will have to rely on adaptation measures. Structural engineering measures are crucial and irreplaceable.

There will always be a residual risk. This must be placed on the shoulders of all groups in society, the government, the people concerned, and the insurance industry. Design of protection works should be based on the overall risk and consider that concentrations of high-value locations contribute far more to the risk than, for instance, agricultural areas with scattered dwellings. The Dutch approach that uses risk (not hazard) as the decision-making basis should be taken as a role model. In the case of large losses, the insurance sector is an indispensable partner.

Great natural events are not avoidable. Great disasters are. Catastrophes are not only products of chance but also the outcome of interaction between political, financial, social, technical, and natural circumstances. Effective safeguards are both achievable and indispensable, but they will never provide complete protection. It is crucial for efficient risk management of a society to be aware of that.