Rachel Carson Center

Perspectives

How to cite:

Mauch, Felix. "The Perils of Water: Floods, Droughts, and Pollution as Natural Hazards and Cultural Challenges." In: "On Water: Perceptions, Politics, Perils," edited by Agnes Kneitz and Marc Landry, *RCC Perspectives* 2012, no. 2, 63–70.

All issues of *RCC Perspectives* are available online. To view past issues, and to learn more about the Rachel Carson Center for Environment and Society, please visit www.rachelcarsoncenter.de.

Rachel Carson Center for Environment and Society
Leopoldstrasse 11a, 80802 Munich, GERMANY

ISSN 2190-8087

SPONSORED BY THE

Federal Ministry of Education and Research

Deutsches Museum

LMU LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN

Perils: Natural Disasters and Cultures of Risk

Felix Mauch

The Perils of Water: Floods, Droughts, and Pollution as Natural Hazards and Cultural Challenges

There is no doubt about the fundamental role of water on our "blue planet." Not only is it an essential component of natural cycles and human environments but also, ultimately, the basis for all life. In accordance with this omnipresence, water presents itself in the most varied forms and states. A constantly changing entity that—whether still or stormy, frozen or liquid, in the form of snow, rain, or vapor, in rivers, ice masses or oceans—conjures up the most varied perceptions. Water is inherently dynamic to a degree that can scarcely be emphasized enough. It manifests itself both as a fact of nature and as something that is culturally created, is both an ecological reality as well as a social good, and possesses a significant cultural, religious, economic, and political meaning.

Water, though, is not merely a force of generation and regeneration, but also a potentially dangerous substance: but only—and this is decisive—when considered in relation to humankind. For, in itself, water is not a threat. It is the relationship between water and humankind, which constantly changes according to time and place, that determines the potential of the adjective *dangerous*. Which aspects of this relationship constitute a hazard is ultimately dependent on the position of the observers and the constraints to which they are subject. Geographic, temporal, and social differences play a decisive role. Thus, the way in which a farmer from the Great Plains associates water with danger manifests itself differently than for a farmer from the Sahel zone, for inhabitants of the Philippines differently than for those of the North Sea coast. And over the course of history these perspectives, in turn, undergo a constant process of change.

Despite this abundance of interpretations, a common thread is evident: water is perceived as dangerous both where there is *too much* and where there is *too little*. In such cases, a (water) disaster is frequently not far off. Although danger is often perceived as a threat that can still be prevented, a disaster is the destructive realization of this danger.

This essay was originally written in German and has been translated for the *Perspectives* by Brenda Black. Unless otherwise noted, all translations of German sources are also the translator's.

In order to understand the impact of water cataclysms, environment and society must be examined in tandem. Such events are always culturally determined: although they have a natural origin, the effects of these catastrophes are primarily social. It is the vulnerability of human communities that decides the magnitude of a water disaster. The consequences stand in a reciprocal relationship to a community's technical and social resilience, which is distributed highly unequally. In general, it is the socially disadvantaged who lack the resources necessary to avoid this danger through preventive measures of their own or by means of social safety nets. Water then becomes both literally and figuratively a question of life *and* death. The life-giving power and the destructive violence of this element converge. Because of this ambivalent character, human societies have always given a great deal of attention to the formal qualities of water in their surroundings.

Too Much Water—Floods and High Water Catastrophes

Extreme events such as floods, storm surges, and tsunamis are excellent examples of the interrelationship between natural and social structures. They provide first-hand, tangible experience of the dangerous aspects of water for large portions of a population, frequently in a most catastrophic manner. Approximately ten thousand floods are documented each year worldwide, some of which develop enormously destructive potential. One of the most serious floods in history occurred in 1887 along the Yellow River in China: around a million people died when masses of water poured out all along the river bed over eleven cities and countless villages.

Natural triggers are generally heavy rains, storms, or snow melt. But earthquakes, too, can cause giant waves (tsunamis), which usually outstrip other types of floods in their sheer destructive force. Judging by the number of victims, the most devastating natural disaster of the twenty-first century so far occurred in December 2004, when tsunami waves of up to 30 meters high—triggered by an underwater earthquake near the coast of Sumatra—spread over the Indian Ocean. More than 230,000 people died in the countries of South Asia, the Bay of Bengal, the Andaman Sea, and along the eastern African coastline.

In the wake of disastrous floods, questions are frequently asked that relate the past to the future: Has this ever happened before? Are such events becoming more frequent? From a historical perspective, and according to the current state of scientific research, the answer in both cases must be "yes." Despite the tendency to refer to such events as "once-in-a-hundred-years" occurrences, destructive floods are generally not isolated phenomena. Rather, they are "recurring exceptions" whose origins have a long and complex history.

Storm Surges as a Permanent Threat

In a region that is geographically at risk—such as the North Sea coast of Europe, which has been struck by storm surges again and again for centuries—the perilous forces of water and the ever-changing solutions that humans have devised to meet this challenge are particularly clear. On the North Sea coast, storm surges develop from the interplay of wind activity and astronomical tides. In this region water has long been perceived as a threat with manifold manifestations. Storm surges, such as those anchored in the collective memory of the inhabitants as a *Grote Mandrenke* in the years 1362 and 1634 or the *Great Flood* of 1962 in Hamburg, remain to this day prominent caesura and focal points of regional involvement with nature and the element water.

At the same time the perception of storm surges is not limited to the archetypal motif of the destructive and punishing violence of water, but also includes water as a medium of cleansing and renewal. This interpretation goes back to the biblical story of Noah's Flood. Far into the modern era, natural catastrophes continued to be interpreted as acts of judgment by a divine power, called forth by human sins and hubris. The question of *why* was answered with a demand for temperance and a return to a manner of life pleasing to God. Thus, cataclysmic contingency appeared acceptable: dangerous water as a form of catharsis.

However, people have always attempted to counter the threat. In order to solve both the questions of human interaction with nature and attempt to contain nature—a dangerous force—humans have molded large portions of the coastal landscape. Thus the dike, for example, is one of the oldest forms of large-scale technology that exists and serves—not only on the North Sea—as a protective measure against and a cautionary memorial to the recurrent force of nature that is water. The dike embankments in the coastal landscape

stand visible to all as an anchoring point for remembrance of this force. Storm surges represent not only a threat, but also equally the "battle" against this danger.

Thanks to technological innovation and regulatory intervention in the environment, for a long time humans considered themselves the victors in this confrontation. The once-valid concept of adapting one's lifestyle to nature altered over time to a concept of adapting nature to humankind's lifestyle. Only recently has the insight begun to circulate again that total domination of nature is not possible. Complex systems such as rivers and hydrological cycles cannot be completely controlled. Water catastrophes inspire their victims to recall this fact, which we frequently choose to forget. Inundations occurring in environments that are highly developed, such as New Orleans in 2005, are emblematic of this situation.

Too Little Water—Water Shortages, Droughts, and Desertification

In the light of the great number of floods and inundations around the world, it may seem surprising that one of the greatest dangers presented by water is the lack of it. Human societies have always been concerned not only about rising but also sinking water levels. The danger of dryness is a global phenomenon as much as it is a regional one. Prolonged dry periods and droughts affect arid regions on all continents, with varying intensity. Since the beginning of the 1990s about 44 percent of all drought catastrophes have occurred on the African continent (most of them in eastern Africa), 28 percent in Asia, 17 percent in the Americas, and 6 percent in Europe. In contrast with flood-related disasters, which typically upset the social order suddenly and directly, the development of a catastrophic water shortage is more gradual. However, when drought is followed by famine the consequences for a society are no less significant. The scope of their impact magnified by political instability, the droughts and poor harvests in the Sahel region between 1968 and 1985 led to one of the most devastating humanitarian catastrophes of the twentieth century.

Once again, it is the interplay of natural and social conditions that causes water scarcity to become a fundamental problem. Prolonged lack of precipitation in arid or semi-arid zones is, as a rule, the climatic cause of a drought. Decisive in creating the dangerous potential of *too little* water remains, however, the reciprocal interaction between natural

impulses, human reactions, and social consequences. Demand and distribution of water as well as factors relating to access are key parameters.

This can be seen clearly in the example of *desertification*, a phenomenon that consists of the damage or destruction of natural resources, such as earth and vegetation, in areas with a relatively dry climate as the result of overuse by humans. Arid regions make up more than a third of the land on the planet: of these, 70 percent are subjected to processes of desertification, affecting more than 100 countries. In the countries of the sub-Saharan region, central Asia, and South America, the ecological consequences include silted-up central plateaus and land degradation as well as dried-up river beds and depleted, unproductive farmlands. As early as 1977 the United Nations recognized this form of *man-made* water catastrophe as one of the most serious worldwide environmental problems in the United Nations Convention to Combat Desertification.

Polluted Water

If the already-mentioned dangers were not enough, an immense portion of the water circulating on Earth is also considerably contaminated. Poor hygiene and the lack of sanitary facilities have caused this vital resource to mutate into an agent of disease. According to the United Nations, at the beginning of the twenty-first century more than 900 million people had only limited access to clean drinking water and 2.5 billion suffered from inadequate hygiene standards. Altogether this amounted to about half the population of the world. This situation—which primarily affects the socially disadvantaged and above all women¬—was recognized as a central problem in the Millennium Development Goals adopted by the United Nations. The initiative *International Decade for Action: Water for Life* (2005–2015), therefore, intends to halve the percentage of people without access to clean drinking water as an important step towards combating poverty on a global level. In March 2012, United Nations Secretary-General Ban Ki-moon stated that 89 percent of the world's population can now access safe drinking water, meaning that 783 million people are still without access. Sanitation also remains a major problem. At present 20,000 people are dying every day due to sicknesses caused by polluted water, most of them in countries in the Global South. This means more victims than those killed by tsunamis, floods, and malaria together. Water contamination is thus one of the primary causes of death worldwide.

Water as a Global and Local Problem Area

As has been shown, the challenges of water were and remain extensive. Excess water, the lack of water, and the pollution of water are socio-ecological "hot spots" and reflect the fundamental meaning of water for all areas of human life. Moreover, it is never nature alone that creates the threat; rather, it is in relation to humans that water first becomes dangerous. It is of immense importance to consider both the natural as well as the "unnatural"—that is, the social and cultural—causes of water catastrophes. The causes, reception, and consequences of floods, water shortages, and conflicts differ not only depending on their time and place but also on their specific physical and cultural environment.

The complex interrelation between water and society is not merely material; rather, it includes the symbolic constructions of "dangerous water" and the conditions of the reception of these narratives as well. Thus, the consciousness that humans are jointly responsible for natural disasters as a result of their lifestyle and their way of dealing with the environment was forgotten for a long time. Human-based interference in ecosystems such as urban sprawl, deforestation, and infrastructure projects has only recently begun to be interpreted critically (although not by all). And even then there are significant differences. While the general public is indeed aware of the threat of high water and floods, recognition of the dangers of water pollution and water shortage still remains in the shadows.

The Future of the Dangers of Water

Environmental scientists and critics of the status quo predict that humankind will experience problems with water first and foremost in their expansive usage of natural resources, and that they will run into unyielding limits in the near future. Water shortages are already causing waves of migration and battles over distribution, which could escalate to grave political, social, and economic conflicts. The danger of serious floods is increasing due to climate change. Extreme precipitation, but also droughts, have increased dramatically in frequency and intensity over the last 40 years. At the same time, the damage caused by each catastrophe is also rising. In the course of worldwide

urbanization, large agglomerations with high population densities face particularly large challenges. Water pollution proves to be a central problem here as well.

Admittedly, human attempts to control water are as old as the fear of water. At the same time, the amount of floods, droughts, and river degradation demonstrates that these attempts have not always been successful and that—particularly in the course of global climate change—solutions of the past are likely to be less suitable in the future. *Secondary disasters*, in which the disaster management systems and the technological infrastructure themselves become a new danger, are no longer unusual. Here the belief that it is possible to develop a reliable safety measure is just as deceptive as the hope that water crises and disasters are merely an exception to the norm.

On the contrary, danger is a constant, essentially inherent component of the human-water relationship. It chiefly remains hidden in the subconscious of the general population until it rises to the surface once again, in catastrophic proportions. In recent decades this has happened, not necessarily more often, but at least more severely. Societies will need to recognize the dangerous realities of water in the face of the changes happening globally and locally and redefine their relationship to this fluid element accordingly. Otherwise, not only will the words “water” and “danger” continue to be mentioned in the same breath, but, increasingly, “water” and “catastrophe” as well.

Further Reading

Bankoff, Greg. *Cultures of Disaster: Society and Natural Hazard in the Philippines.* London: RoutledgeCurzon, 2003.

Behnke, Roy H. *Desertification: Causes, Impacts, and Consequences.* Berlin: Springer, 2011.

Böhme, Gernot and Hartmut Böhme. *Feuer, Wasser, Erde, Luft: Eine Kulturgeschichte der Elemente.* Munich: C. H. Beck, 2010.

Devine, Maureen and Christa Grewe-Volpp, eds. *Words on Water: Literary and Cultural Representations.* Trier: WVT Wissenschaftlicher Verlag, 2008.

Eswaran, Hari, Paul Reich, and Taweesak Vearasilp. "Perspectives on Desertification during the Anthropocene." In *Land Degradation and Rehabilitation: Dryland Ecosystems,* Edited by Angel Faz Cano, Ahmet R. Mermut, Joselito M. Arocena, and Roque Ortiz Silla, 1–16. Reiskirchen: Catena Verlag, 2010.

Hukka, Jarmo J., José E. Castro, and Pekka E. Pietilä. "Water, Policy, and Governance." *Environment and History* 16 (2010): 235–251.

Kempe, Michael. "'Mind the Next Flood!' Memories of Natural Disasters in Northern Germany from the Sixteenth Century to the Present." *The Medieval History Journal* 10, no. 1 (2007): 327–354.

Van Dam, Petra J. E. M. "Water, Steam, Ice: Environmental Perspectives on Historical Transitions of Water in Northwestern Europe." In *Elements—Continents: Approaches to Determinants of Environmental History and their Reifications*, edited by Bernd Herrmann and Christine Dahlke, 29–43. Stuttgart: Wissenschaftliche Verlagsgesellschaft, 2009.