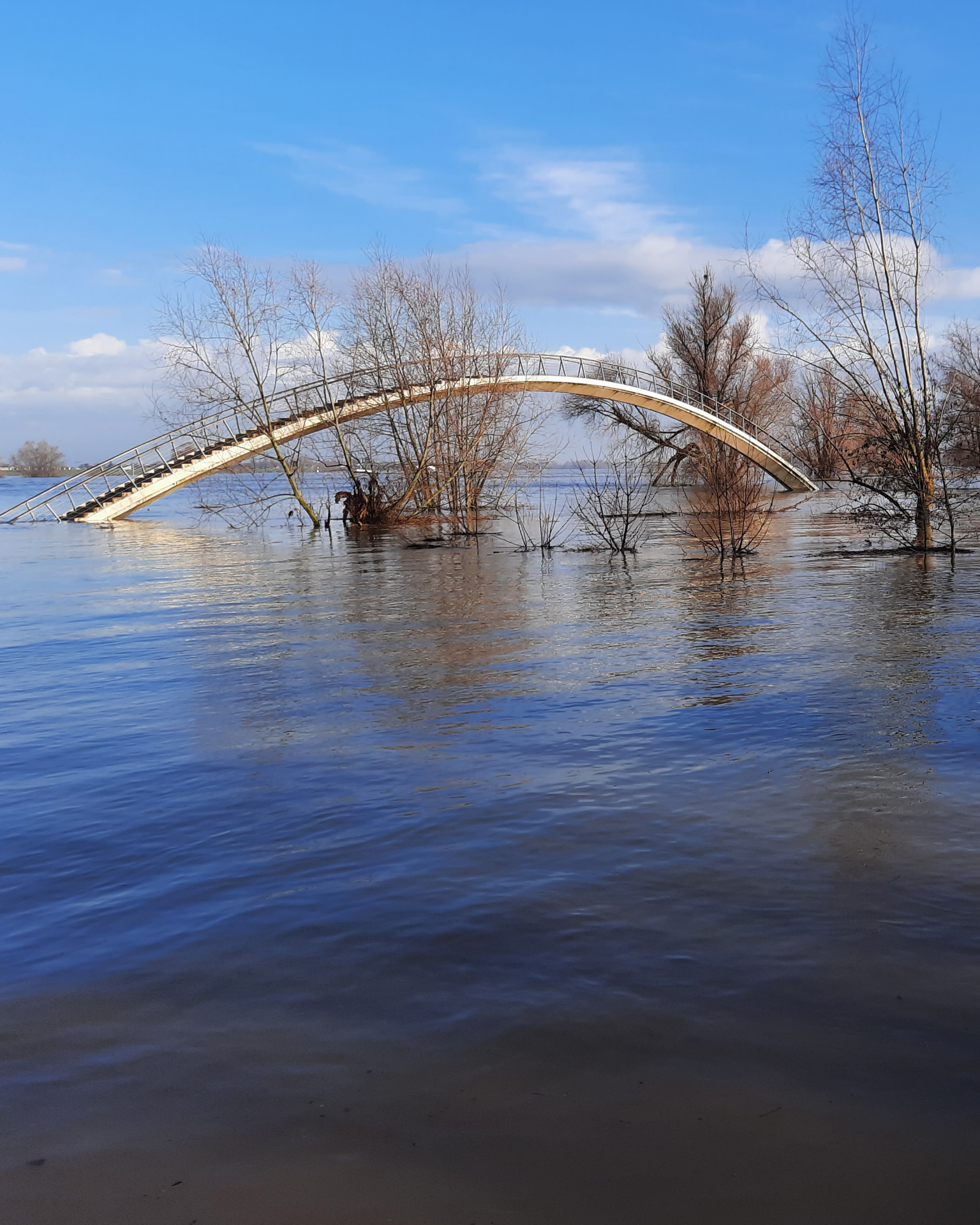

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The "Who" And "What" Of Water Ethics

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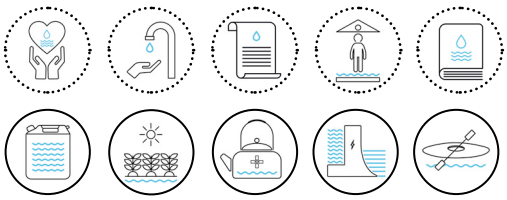
Water consumption and freshwater supplies are unevenly shared worldwide, while droughts and floods as extreme climate events are becoming more common. Water challenges cannot be addressed by technical means only. We must reflect on the trade-offs between economic and environmental concerns, and identify which water-related risks to prioritize. Thus, water ethics become an important analytical key in posing two critical questions: what values are at stake when we address the world's water challenges, and who is affected by these water challenges? This links to questions of responsibility: to the extent that these water challenges are related to past behavior, the "past" may create a responsibility to address these present challenges, including when they materialize in other regions.

KEY THEMES



< *Fig. 1 High water near Nijmegen, the Netherlands, February (Source: Neelke Doorn, 2021).*

Introduction

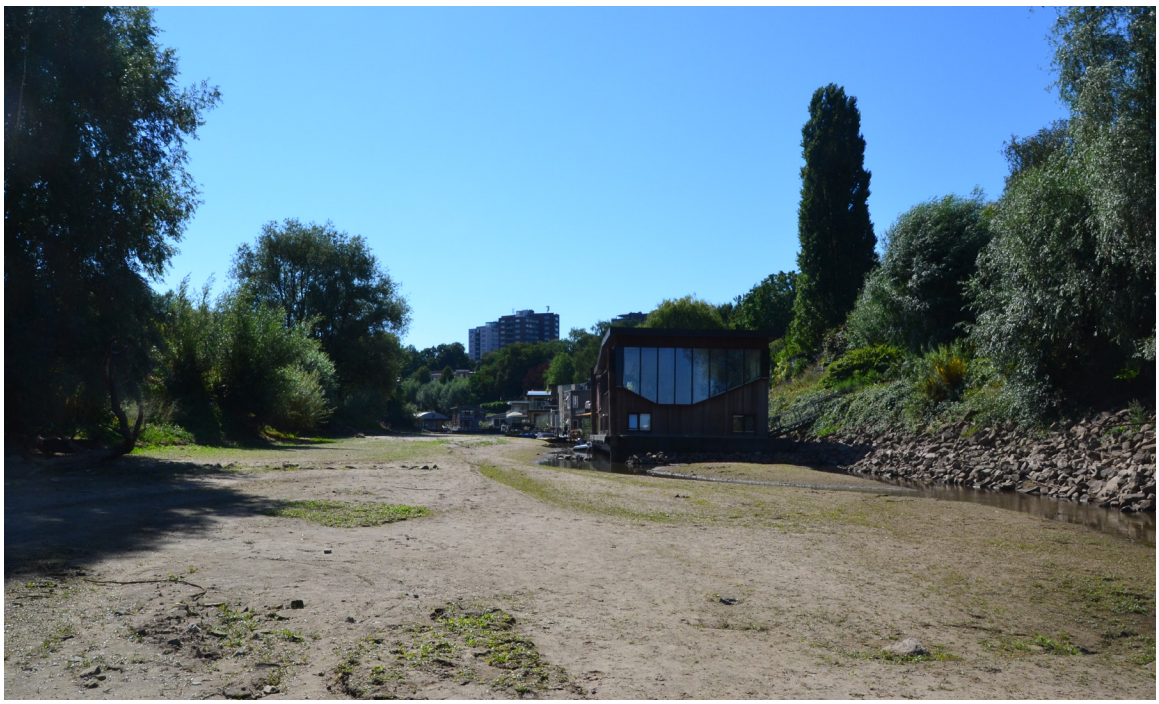
Water is increasingly recognized as posing significant ethical challenges (Groenfeldt 2013; Doorn 2019; Meisch 2019). Although people in water-rich countries often take the availability of water for granted, a significant percentage of people in the world do not have access to clean drinking water or sanitation services, and an even higher percentage die from waterborne diseases such as diarrhea. The World Health Organization (WHO) estimated that in 2020, two billion people lacked access to safe drinking water, and over 1.7 billion people lacked access to basic sanitation services (WHO 2022a, 2022b). To put this in a global perspective, the number of people without access to safe drinking water is twice the population of the US, and more people have a mobile phone than a toilet (Doorn 2019).

The WHO has calculated that basic consumption and hygiene needs can be met with 100 liters per person per day, or 36.5 cubic meters per person per year (Howard and Bartram 2003). Whereas an increasing number of people in arid countries have less than that amount, the water footprint of a typical Western liquid consumption pattern (that is, the total amount of water needed to produce our daily consumption of beverages, including soft drinks, alcohol, coffee, tea) is as much as 900 liters per day – enough to fill 10 average size baths (Hoekstra 2013). Depending on where the ingredients are produced, this may involve a transfer of water from water-stressed areas to water-rich countries through these ingredients ("virtual water transfer").

Water can also be available in excess. An increasing percentage of the world's population lives in areas that are at risk of flooding, a situation exacerbated by anthropogenic climate change. Flooding is the deadliest type of natural disaster. Although most often seen as separate issues, water scarcity and flooding are related. Solutions to water scarcity may have a negative impact on safety from flooding, and vice versa. These ethical challenges cannot be solved by technological means only. There are trade-offs to be made between economic and environmental concerns, and we need to assess and prioritize different water-related risks, but also consider the relation between governmental actors and citizens. The work involves value-laden questions, where values can be understood as "lasting convictions or matters that people feel should be strived for in general and not just for themselves to be able to lead a good life or realize a good society" (Van de Poel and Royakkers 2011, 72). Hence, these questions reflect what people consider important in life and for society and they cannot be solved by simple calculation. Elsewhere, I have presented the main questions in water ethics as comprising a "what," in the sense of what values are incorporated into the system, and a "who," as in who should make choices in water policy and who is affected by those choices (Doorn 2018b). In the remainder of this article, I will briefly sketch these two categories of questions.

The "What" of Water Ethics: Value Considerations in the Water Domain

First the "what." A significant aspect of water is the multitude of services it provides. Water is recognized as being essential for life and a basic human need, both in terms of drinking water and in terms of sanitation. Water is equally important for agriculture and, also in some countries, for transportation. In its most simple form, the debate on water scarcity is about prioritizing different kinds of water use. In this discussion, the value of water is primarily instrumental, a



^ *Fig. 2 Low water near Nijmegen, the Netherlands, August (Source: Neelke Doorn, 2022).*

basic human need indeed, yet a relatively tangible one. This also holds for the environmental value of water. If these different services clash, how do we decide which should take precedence and who makes that decision? In ecological economics, a common way to make a trade-off between conflicting services is to express it in one monetary unit – this can be money but does not have to be – and then look for the highest value. In other words, seek to maximize the outcome. This raises a number of questions, however. First, can all services really be expressed using the same measure? From an ethical point of view, we can justifiably say that the values these services might represent – safety, health, ecology, the future availability of water sources, but also the socio-cultural practices related to water – are incommensurable. That is, they cannot be expressed by the same standard of measurement (Chang 1997). Second, we may be overlooking important considerations when we focus on maximization only. Is it not much more important to maintain flexibility (Teodoro et al. 2022), or to prevent irreversible consequences such as the loss of unique ecosystems (Doorn 2018a)? In the past, many technological solutions in the water domain have created lock-ins that are now considered undesirable. Yet, this does not automatically mean that all interventions that create some irreversible impact are by definition undesirable. In the water domain, for example, the traditional Dutch approach to make the land livable and safe from flooding can be considered a lock-in, causing land subsidence and having a negative impact on the aquatic ecosystem, yet the resulting Dutch landscape, with its polders and dikes, is also appreciated by many people as cultural heritage. One of the open questions is how to recognize this heritage value, without being

forced to continue a practice that has become undesirable for other reasons. A possible way to look at this question is by distinguishing the technical function that an object or infrastructure is designed to fulfil from its material properties. Taking the example of the Dutch polders, this would mean that an alternative approach to flood risk management could be implemented, while leaving parts of the physical object intact. While this question is far from fully answered, asking such questions and making trade-offs explicit represents a necessary first step.

The "Who" of Water Ethics: Stakeholders, Actors and Responsibilities

Now for the "who," by which I mean "who is affected" and "who should and can act?" The concept of resilience serves to illustrate this "who." In recent years, and certainly regarding climate change, we have seen increasing calls for resilience. The term resilience in this context is often linked to its ecological definition (Cañizares, Copeland and Doorn 2021); that is, the ability of an ecosystem to recover and adapt after a change. This is an emergent property, an ability derived from the composition of the system as a whole, with all its separate components (Walker et al. 2006). Resilience has come to be seen as a promising alternative to traditional approaches in safety science, which often look quite mechanistically at disasters and incidents. With the introduction of a resilience-based approach to safety science, the emphasis has shifted to flexibility and learning ability, enabling systems to deal much better with unexpected threats.
It is often assumed that, in the context of climate adaptation, resilience policies ask for new responsibility arrangements between central governments and citizens, with citizens getting a more prominent role (Doorn, Brackel and Vermeulen 2021). Analogous with its ecological definition, we can interpret resilience in these domains as an approach in which everyone plays their part, albeit in different ways, so that together we are able to deal with all the unexpected climate and water risks. But is everyone capable of doing this? If a resilient city involves individual citizens having to do more while the government withdraws, this could result in undesirable inequalities.

In short, a resilience-based approach raises questions about who should act and who benefits (Meerow, Newell and Stults 2016), about who is given the responsibility or space needed to do so (Hegger et al. 2017), and about what those involved are actually capable of (Doorn 2016). If these "who" questions are not considered, the approach can create undesirable inequalities and maintain or even strengthen existing vulnerabilities (Davoudi 2012).

Ultimately, the "who" also links to our past and its heritage. Past behavior has led to some of today's grand challenges in the water domain, such as water shortage, water pollution and anthropogenic climate change. It is clear that geographic regions that have contributed most to this – mainly the Global North – are not necessarily the regions that are most impacted by it – mainly the Global South. This means that the Global North's past also involves a responsibility for the "present" it has created.

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