

# Could Britain manage floods like the Dutch?

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Just like the British in 2014, the Dutch have experienced serious inland flooding in the post-war period, including in 1953 when there were around 2,000 casualties. Moreover, in 1993 and 1995, river floods damaged more than 10,000 houses and companies, and some 250,000 people were evacuated.

The disturbing news is that the British floods are part of a much bigger picture of growing flood risk across the globe. The United Nations, for instance, has calculated that in 2012 the world reached a tipping point where more than half of the global population now lives in flood-prone areas.

This is a staggering statistic and places large responsibilities on our political leaders to adopt a more forward looking, long-term approach to flood risk. In a generally more risk-averse society, key questions that the political system must resolve include where to invest in flood protection and management, and what kind of options are needed to decrease the risk and mitigate the consequences.

For the Dutch cabinet, such priority setting is based on a periodic national flood risk assessment. While some other countries have comparable instruments, it is an unfortunate reality that too many societies still seek only to invest properly in adequate flood reduction

after large-scale problems occur.

Given the scale of increased risks in coming decades from global warming, this attitude must change for both human security and financial cost. As the Dutch example shows, there's an enormous amount to be gained, both economically and socially, by investing in better flood protection.

A key reason why the Dutch are world leaders in flood risk management is that more than 60 percent of the country is flood-prone (some areas are 4 metres below sea level). Our vulnerability is compounded by the fact that a large part of the country consists of a delta area next to the North Sea at the end of four main European river basins: the Rhine, Meuse, Scheldt and Ems.

The combined effect of this is that consequences of a large-scale flood, as in 1953, can be catastrophic causing thousands of casualties, and tens of billions of euros of economic damage. Indeed, the consequences today would be much larger than 1953 if a comparable flood occurred since the economy has grown 10 fold, and the population has doubled.

After 1953, the Delta Committee was created, mainly consisting of civil engineers but also with the Nobel Prize economics winner professor Jan Tinbergen. The committee was tasked with protecting the Netherlands against sea floods by building dams which shortened the coastline so that the maintenance became cheaper.

The committee was also advised to use a very robust safety measure of 1 in 10,000 which means that the flood defences can withstand water levels which will happen on average once every 10,000 years. This advice, which is currently being reviewed, remains at the core of the Dutch flood management system some 60 years after the 1953 floods.

## TAXES FOR DEFENCE

Today our approach to flood-risk management is mainly built on prevention, which requires the country to invest around 0.5 percent of GDP annually, a sizeable sum. Over several decades, we have found that the most effective way to prevent floods is to maintain safe flood defences, for example, levees, storm surge barriers and dunes.

However, it is not just careful maintenance, and robust protective measures that lie at the heart of the Dutch model. Our approach to flood-risk management is also embedded and highly coordinated across different parties, in at least three different ways.

The first way is by the law. Flood defences are part of legal statutes that articulate how

responsibilities are distributed among different group. And this law includes far-reaching provisions that landowners have to sell their land if this is needed for the safety of the country.

The second way the Dutch approach is embedded is across a network of independent water boards. Until 40 years ago, there had been thousands of small water boards. Each Dutch polder generally had its own board, often headed by the most important farmer.

Nowadays, however, there are only 25 water boards, which are professional and independent organisations. They are, in effect, part of the public sector and have their own tax system (with every citizen, not just farmers as in the past, paying taxes. And these taxes are used to build and maintain flood defences and pumping stations etc.)

The third way in which the Dutch model is integrated into wider society is an 'expertise network' on flood risk which combines knowledge from science, engineering practice and policy, including Delft University of Technology where I am a professor. The mandate of the network is to develop up-to-date guidelines for design and maintenance of the flood defences, and these are regularly reviewed.

Taken overall, Britain will probably face even greater flood risks in the future unless there is more maintenance and more protective measures are put in place in coming years. Here the Dutch model has much insight to potentially offer, and we are eager and willing to share our experience to help make Britain even safer in the future.

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