**The Dutch Solution to Floods: Live With Water, Don’t Fight it**

*With more than half the country at or below sea level, the Dutch are experts on water management – and its people have had to make sacrifices*

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 Kamerik polder, one of 3,000 across the country. The Dutch have had such systems for a millennium, but water management became a greater priority after 1953’s flooding deaths.

Nol and Wil Hooijmaaijers have been watching the TV news from Britain with some horror. "It's terrible to see, very sad, I am so sorry. And when you see the cows up to their knees in the water," Wils tuts and shakes her head. "We are so lucky." Sitting at their oak dining table, looking out of the windows of their modern farmhouse at the newly planted saplings standing firm in the grey afternoon, the couple know what it is like to lose a home on a flood plain.

Their old house and fields were sacrificed to a flood management scheme that forced them to sacrifice their farm for the sake of 150,000 strangers in the city of Den Bosch, some 30km upstream. Both in their sixties, they now live on a "mound dwelling", a man-made hillock with a flattened five-and-a-half acre top. There are eight dairy farms strung along the 6km dyke, like eight giant mud pies plunked down on the flat fields and linked by a raised road. All with the same large grey cattle sheds and newbuild houses in each plot.

All but one of the 17 farms that had been scattered across the land before the government's Room for the River agency arrived have been demolished. "That one goes in four weeks," said Nol, pointing to a tidy farm settlement behind mature trees.

The project on the Overdiepse Polder, eye-shaped farmland enclosed between the curves of two rivers, is one of 40 programmes due to be completed by next year by Room for the River. Set up in 2006, the agency was given a budget of €2.2bn (£1.8bn) to reduce the risk of Holland's four main rivers flooding. It has been busily lowering floodplains, widening rivers and side channels – basically giving the river space to cope with extra water – and moving 200 families, including the Hooijmaaijers, out of their homes. It's a project that the Irish government among others is interested in emulating and, after this winter, Britain may want to take note.

The low-lying Netherlands has been fighting back water for more than 1,000 years, when farmers built the first dykes. Windmills have been pumping the stuff off the land since the 14th century and the Overdiepse Polder mound dwellings are based on what the earliest inhabitants built here in 500BC. One of the most densely populated countries on the planet, 60% of the [Netherlands](https://www.theguardian.com/world/netherlands) is vulnerable to flooding, and its peat-rich agricultural soil is subsiding even as climate change is raising sea levels.

The country's universities are producing some of the world's best water engineers and managers and it is exporting its expertise abroad; the Dutch government has advised on water governance projects in China, Africa and Australia.

The Netherlands has also learned from past mistakes – a 1977 report warning about the weakness of the river dykes was ignored because it involved demolishing houses. It took floods in 1993 and again in 1995, when more than 200,000 people had to be evacuated and hundreds of farm animals died, to put plans into action.

Hans Brouwers is a senior rivers expert at Rijkswaterstaat Room for the River. He shudders at the idea of dredging or flood defence maintenance being neglected and says that the UK should look closely at where it has gone wrong this year.

According to Brouwers, the clear demarcation of responsibilities in the Netherlands is crucial, as are the present projects that he is involved in pushing through.

There are no financial packages for people who have to move. "They get the market value of their house and that is all. We will help them find another place, but not financially. The only thing we do is to make sure that they do not lose money." He insists people will accept the situation "if you are honest and proactive and go to people and talk to them and take their fears seriously". Only two cases have been taken to court by people who didn't want to leave, both of which have been won by Room for the River.

"Of course there is opposition and of course people are hurt," said Brouwers. "They aren't singing and dancing about it. If you are the third generation in that house and you have to move it is terrible. But we have to find a way to live with water rather than fight it. Our task is clear. Our cashflow is constant. The programme is on track. Holland is divided and ringed by dykes and that will not change. We have built our cities for years close around rivers, we have given them no space so we have to change that."

At Overdiepse, nine families chose to leave the area. "When we first heard in 2001, we were shown a map and all of our area was coloured blue," said Nol. "The farmers were surprised and worried and the first thought was no, we will not let this happen. But in the flooding of 1993 to 1995 we had a close call here. It was clear that something had to be done. Like the UK is having now, it was a wake-up call. So maybe if we co-operate we can be involved. For me, I decided to take the opportunity to invest in new dairy machinery and modernise in the new place.

"I don't think in the cities that what has happened here is a topic; they think water protection is the responsibility of the government and they trust them to take care of them. They get on with their daily lives. With dry feet."

Harold van Waveren is a water management expert from the Dutch ministry of infrastructure and environment. His colleague is in the UK helping to advise on the flooding.

He says that, while no risk is ever zero, the Dutch system is about taking nothing for granted and being constantly on top of maintenance of coastal and river defences.

"The Dutch are extremely proud of their water management and we have eight million people [almost half the population] living below sea level who depend on it. We have learned a lot from floods in the past, especially from 1953, the big flood which Britain also had, when we had a lot of damage and 1,800 casualties. We started the delta programme then and put a lot of flood protection in place.

"Our organisation is very important. We have regional water boards with their own tax system who are in charge of dredging and of the programmes of dyke maintenance. We have adapted climate change into urban planning, and development on flood plains has not been allowed since the 80s. More and more we are working with nature – on the coast, management is about building up the sand dunes and beaches.

"In extreme situations, of course, you have to fight but in everyday life you have to live alongside water. Sometimes people resent the spending that goes on dykes because they don't see the benefit the next day. That is why we are glad Dutch politicians agreed to constant funding. There is no end to this. It's a continuous process. We do not want to be surprised again."

Several Dutch companies have experimented with amphibious housing. In 2005 one architectural company, Dura Vermeer, built 32 "floating" homes in Amsterdam, based loosely on old Dutch house boats. The plan was to beat the government ban on building behind the dykes which surround the cities, the equivalent of banning building in flood plains, by creating amphibious houses of two types: one that would be on dry land until it flooded, when it would effectively float up with the rising water; and another that was built over water but that could cope with its changing levels. Most of the houses are now holiday homes.

Three years ago, Dura Vermeer built another 12 in Maastricht. "They are a little more expensive than other houses, but they need no more maintenance and they can be in very special places," said Glenn Mason of Dura Vermeer. "We are not restricted as is the rest of Holland's housing. So much of Holland is below sea level and you can't build as you would normally, so we are running out of room and have to look to adapt our living style. We are one of the pioneers of working with water and now we are seeing a lot of other countries coming to look and to copy them."

Mason said the Maastricht houses, costing from €200,000-€800,000, were not all sold yet "because of the economic crisis and because there is a housing crisis too in the Netherlands". A tightening of regulations has made it harder for some people to get a mortgage. It may also be that people may joke about needing an ark but are uneasy about living in one.

"It is an experiment and at the moment all our floating houses are recreational homes. But in places like Rotterdam, where they are running out of space fast, we are looking at floating offices along with houses which are amphibious. It may well be the future."

In Overdiepse Polder, Nol Hooijmaaijers shows off this week's seven new Friesian calves and says he believes the future has arrived.

"I'm lucky, the farm is safe, the cows are safe, the people in the city will have dry feet," he said. "I have a son who is taking over the farm, otherwise what would I have done? Just retired probably, given up."

He shows the path down to the field that his cows take when they feel in the mood. "Six metres, up here in our castle on the hill! Now let the water come. I would like very much to see that in my lifetime. We have done this for the next generation, but I would very much like to see if it works. I would like the taxpayers to see that it works. Let the floods come."