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## Dutch defense against climate change: Adapt

As the world works to prevent disaster, the Netherlands plans for it

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AMSTERDAM -- With the Copenhagen summit starting Monday, chances remain uncertain for a historic breakthrough in the fight to prevent climate change, but the Netherlands is leading a fight of a different kind: How to live with global warming.

As sea levels swell and storms intensify, the Dutch are spending billions of euros on "floating communities" that can rise with surging flood waters, on cavernous garages that double as urban floodplains and on re-engineering parts of a coastline as long as North Carolina's. The government is engaging in "selective relocation" of farmers from flood-prone areas and expanding rivers and canals to contain anticipated swells.

The measures are putting this water world of dikes, levies and pumps that have kept Dutch feet dry for centuries ahead of the rest of the world in adapting to harsher climates ahead.

Critics describe some of the efforts here as alarmist -- perhaps too much, too soon. But other experts see the climate defense system being built in the Netherlands as a model for other nations -- including the United States, where officials are seeking Dutch advice for how to protect New Orleans and other low-lying coastal cities.

As nations from Britain to Bangladesh come up with survival strategies, the Dutch approach underscores a shift in thinking among scientists, planners and politicians, who only a few years ago viewed talk of adapting to climate change as akin to environmental surrender.

Although almost everyone agrees that setting lower emission targets will be vital at the two-week summit in Copenhagen, a growing chorus of experts now argues that it might already be too late to prevent temperatures from rising for the next 50 to 100 years. Finding ways for nations to live with climate change could be the more pressing challenge.

Yet the effort in the Netherlands -- where officials expect to spend \$100 a person per year on climate-proofing over the next century -- also illustrates one of the biggest sources of friction among the leaders, including President Obama, converging in Copenhagen for the summit: As countries move toward costly climate defense systems, how will poorer nations cover the price tag of shoring up sinking cities and irrigating drier farmlands?

Those nations are seeking billions in fresh aid from rich countries at Copenhagen, arguing that the industrialized world must compensate them for the warmer planet it is largely responsible for creating. A recent study by the World Bank found developing nations would need \$75 billion to \$100 billion a year over

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the next four decades to adapt to climate change. Project Catalyst, an offshoot of the nonprofit ClimateWorks, suggests a price from \$26 billion to \$77 billion a year until 2030.

"Adaptation is going to prove to be the most difficult, the most combative, and, in many ways, the most important part of the climate negotiations," said Tim Wirth, president of the U.N. Foundation, adding that when it comes to global warming, "the people who are most impacted are the ones who have the least voice. That's going to emerge as a very important political dispute."

Although industrialized countries have historically said they are willing to help cover those costs, they have done little to deliver on that promise. But White House spokesman Robert Gibbs said in a statement Friday that "there appears to be an emerging consensus that a core element of the Copenhagen accord should be to mobilize \$10 billion a year by 2012 to support adaptation and mitigation in developing countries, particularly the most vulnerable and least developed countries that could be destabilized by the impacts of climate change. The United States will pay its fair share of that amount and other countries will make substantial commitments as well."

The United Nations Framework Convention on Climate Change, which governs the international talks, created a "Least Developed Countries Fund" in 2001. But it has yet to receive the full \$180 million pledged eight years ago by rich nations. At the Group of Eight meeting last year in Japan, the United States pledged to give \$2 billion over three years to the World Bank for climate-related activities, including clean technology and adaptation. But the U.S. budget for fiscal year 2009 provided nothing for the adaptation fund, and the 2010 budget bills in the House and Senate -- which have yet to be reconciled -- both give \$75 million to the fund, \$25 million less than the administration requested. "Governments have said they want to address adaptation and they're willing to fund it, but the pledges themselves have not been enough to meet the need," said David Waskow, climate change program director for Oxfam America.

Spurred by the debate, however, nations both rich and poor are moving as never before to plan for the era of global warming.

Most, like the United States, are in the early stages. This summer, the Obama administration established a Climate Change Adaptation Task Force. Under an executive order the president signed in October, the group will produce a national adaptation strategy. The task force is exploring everything from how to integrate climate change planning into federal operations, to helping local communities respond to its future effects.

Bangladesh, one of the world's most flood-prone countries, has adopted a 10-year climate change action plan, seeking international assistance for early warning systems for cyclones as well as new storm shelters and drainage systems. The tiny Indian Ocean island nation of Maldives is ramping up seawalls and exploring houses on stilts, while warning it might need to buy land in Sri Lanka, Australia or elsewhere to relocate its population. A new British plan seeks to further reinforce defenses against the rising Thames River while bluntly stating some existing communities may have to be moved. Arid countries such as Egypt, meanwhile, are preparing for drier times. With the aid of the Dutch, they are experimenting with an irrigation system using moisture sensors to grow crops using 50 percent less water.

"A few years ago, people thought you were a defeatist if you talked about adaptation to climate change," said Malcolm Fergusson, head of Climate Change at Britain's Environment Agency. "We say that mitigation is important but so is adaptation, and the two go together."

No country, however, has gone as far as this nation of 16 million with a land mass two-thirds under sea level that exists largely by the grace of water engineering. Because flooding is an ever-present threat, all Dutch children must learn to swim with their clothes on by age 6; the government provides universal flood insurance

to homeowners.

The dike and levy system here underwent a major refortification after devastating floods in 1953 that killed nearly 2,000 people. In recent years, mega-projects have sprung up as the Dutch seek ways to adapt to rising water levels, with even more ambitious projects planned for years ahead -- in part through the Netherlands Water Partnership, a public-private venture being modeled by nations in Europe and beyond.

In Rotterdam, city officials opted to invest in new parks, city squares and parking garages now under construction that effectively double as Rotterdam's drainage system, filling with water during heavy floods to keep streets, buildings and homes above water. In east Amsterdam, one of three new floating communities going up across Holland looks like an aquatic suburbia. The homes are built on floating platforms of reinforced concrete and literally rise with floodwaters, offering a glimpse into how lifestyles may change as coastal areas adapt.

David Goulooze, 40, a software salesman, and Mirjam Stoll, 29, a teacher, were among the first residents when the homes, starting at about \$600,000, began selling last year. Although little different in appearance from any sleek, modern house on land, the hanging light fixtures in the couple's dining room gently rock even in good weather. Goulooze and Stoll still find themselves getting seasick now and again.

"We know that worst of climate change is a long way off, but we feel like pioneers," Goulooze said. "The Dutch have this in their genes. Everything is a fight against the water. We just have to start fighting harder."

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