

In Flood-Prone Bangladesh, a Future That Floats

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SINGRA, Bangladesh -- With most of his school under floodwaters, 6-year-old Mohamed Achan pulled his oversize tomato-red shorts up around his tiny waist, placed a tarp over his head to guard against the rain, and sprinted barefoot to the edge of his muddy village. There, he waited for his classroom to arrive -- in a boat.

The boats plying the rivers and canals here in northeastern Bangladesh are school bus and schoolhouse in one, part of a 45-vessel fleet that includes library boats. There are plans for floating villages, floating gardens and floating hospitals as well, in case more of this region finds itself under water.

Like a scene out of the 1995 post-apocalyptic movie "Waterworld," in which the continents are submerged after the polar ice caps melt and the survivors live out at sea, the boat schools and libraries are a creative response to flooding that scientists largely agree has been worsened by global warming.

Melting glaciers in the Himalayas are already causing sea levels to rise here, and scientists say Bangladesh may lose up to 20 percent of its land by 2030 as a result of flooding. That Bangladesh is among the most vulnerable countries on the planet to climate change is a tragedy for its 150 million people, most of whom are destitute.

The need for a Bangladeshi Waterworld, experts say, has never been more urgent.

"For Bangladesh, boats are the future," said Abul Hasanat Mohammed Rezwan, an architect who started the boats project here and who now oversees it as executive director of the nonprofit Shidhulai Swanirvar Sangstha, a name that means self-reliance. "As Bangladeshi citizens, it's our responsibility to find solutions because the potential for human disaster is so huge. We have to be bold. Everyone loves land. But the question is: Will there be enough? Millions of people will have nowhere to go."

Climate change is the latest cause celebre in the West, the focus of Live Earth rock concerts and celebrity-endorsed campaigns to reduce the greenhouse gases that have caused temperatures to rise worldwide.

Fighting global warming in the United States means cutting down on air-conditioning usage or relying more on mass transit. But in Bangladesh, global warming means that children like Mohamed Achan are going to school on modern-day versions of Noah's ark. And, as their villages erode and become smaller and smaller islands, the children and their families may eventually live on a boat.

While Mohammed and his parents have contributed little to climate change -- they have neither a car nor electricity -- it is families like theirs that suffer the consequences of the increasingly violent storms and deadly cyclones that scientists have attributed to global warming.

Bangladesh has always been a world capital for natural disasters. The flat country is barely above sea level and sits atop a low-lying river delta, the world's largest. It's also nestled amid some of Asia's largest rivers, including the Ganges and the Jamuna-Brahmaputra.

While melting glaciers have led to rising sea levels, so too have unusually heavy rains in recent years. Floods are damaging Bangladesh's breadbasket regions in what may be the worst threat of all to a population that depends on small-scale farming for food, experts say.

Scientists in Dhaka, the capital, predict that as many as 20 million people in Bangladesh will become "climate refugees" by 2030, unable to farm or survive on their flooded land. The migration has already started. In 1995, half of Bhola Island, Bangladesh's biggest island, was swallowed by rising sea levels, leaving 500,000 people homeless.

"The economic loss for farmers will just be devastating," said MD Shamsuddoha, a scientist in Dhaka who has studied flooding issues in coastal areas. "We're already seeing hundreds of thousands of climate refugees moving into slums in Dhaka. What will happen when things really get bad?"

The crisis is made worse by Bangladesh's poverty and long history of weak and corrupt governments. Farmers who lose land in flooding often fight with neighbors over what is left and who owns what after the floodwaters recede. As a result,

land disputes have backed up the courts in recent years, accounting for 80 percent of Bangladesh's legal suits, said Atiq Rahman, executive director of the Bangladesh Center for Advanced Studies and one of the country's top climate change experts.

"If you're a poor farmer and your village floods, you just can't slap down a credit card and move to Washington. My challenge to the big polluting nations like the U.S., China and India is that for every hundred thousand tons of carbon you emit, you have to take in a Bangladeshi family," Rahman said, only half-kidding as he stood before a map in his office, pointing to land that would be submerged in coming decades. "We have so many things to consider, including learning to live on boats. It will be a huge cultural headache. It won't work for everyone and in some ways is a band-aid to the larger problem. But every last drop and every creative idea will help."

Rezwan, a bookish and energetic man who wears sturdy work boots, has already been recognized for the creativity of his school boats. Former U.S. vice president Al Gore recently presented him with an international environmental award for his use of solar power on the boats.

As a child, Rezwan said, he was always frustrated when school was canceled during monsoon flooding.

"Later in life, as an architect I was asked to design for the rich," he said as he climbed aboard one of his boat schools on a recent rainy Saturday. "But I thought, why can't an architect design exciting things to help the poor in their own communities? I can't tell you how happy I was the day the first boat school took the waters. It was really my dream."

Rezwan started his nonprofit group in 1998 with just one flat-bottomed boat built from local materials and stretching about 30 feet long and 15 feet wide. Today, his boats fit about 60 young people -- 40 on the deck and about 20 on wooden benches set up on the bow.

"At first, I wasn't sure -- go study on a boat?" said Nasrin Sultana, 18, a college student whose classes on dry land have been canceled because of constant flooding this year. "But now I am addicted to the boat library. They have computers, academic books and great novels. People love coming. It's become a community center that people look forward to."

The boat schools are made possible partly by an award of \$1 million in 2005 from the Bill and Melinda Gates Foundation, along with funds from the Washington-based Global Fund for Children.

That money helped Rezwan set up hugely popular Internet services -- including live chats with scientists -- and design a solar-powered lamp that he gives out to families so their children can study at night. Without the lamps, parents would have to burn polluting and expensive kerosene.

Along the winding river canals that flow around the mud-hut villages, mosques and rice fields here, 230 miles northeast of the capital, the boat schools are so loved that crowds of children cheer upon seeing them dock.

The boats operate year-round and offer a full primary school education with the same syllabus as classrooms on dry land. They avoid dangerous weather patterns by sticking close to mapped-out routes, typically along more shallow waters near the communities they serve.

The schools serve about 90,000 families in an area covering more than 300 miles, and make three- to four-hour stops six days a week.

"I love the boat so much more than regular school," Mohamed said, swinging his thin legs as he sat on a bench reading a stack of stories. "It's so fun when it comes to your doorstep."

The school boats have also made it easier for girls to attend classes. Before, their parents were reluctant to let them walk long distances to school; now the schools come to them.

Rezwan said he hopes his floating village idea will catch on. He is working on sanitation issues and already trying to develop floating gardens, similar to those in Kashmir. Farmers there found they could build an earth bed of roots and dirt in a lake -- thus enjoying constant irrigation -- and produce huge harvests of vegetables.

Already, villagers say they know their way of life will have to change.

"I'll be ready if this housing project on water works," said Samsun Nahar, 30, a mother with a baby on her hip who came to a boat recently to recharge her solar lamp. "We're so worried about the floods spoiling our crops that we are ready to do anything. Even live on water."