OER PROJECT

Why Fish Farmers Need a Better Weather Forecast

Can more-accurate weather forecasts help some communities build resiliency? SciShow digs into how innovations can help aquaculture overcome obstacles caused by climate change.

0:00 *Series of clips of Hank Green speaking followed by a video of industrialization with Hank Green's audio continuing as a voiceover.*	Imagine you're a small fish farmer in South Asia, like you're a normal sized person, but your fish farm is small, and a flood has just wiped out your next harvest. That's kind of a bummer, because you were sort of planning on… eating, just in the general future. And it's not really your fault that fossil fuels being burned on the other side of the world have thrown the climate so out of whack that you can no longer predict these severe weather events. It would be nice to at least have a heads up, right? Like, super cool if that was a thing. Fortunately, some scientists are working to make it a thing, ensuring economic and food security for the people most at risk from the climate crisis.
0:37 *Videos of fish harvesting and Hank Green.*	A major portion of the world's food comes from aquaculture— the breeding and harvesting of fish, shellfish, and so on. It's like agriculture but … aquatic. Aquaculture. Unfortunately, our world's changing climate is creating lots of problems for aquaculture, especially for less wealthy farmers in regions most severely impacted by the climate crisis.
0:56 *Clips of heavy rains in Hội An, Vietnam and a river of fish. Videos of Hank Green, a woman working at her computer, and a farmer.*	Heavy rains can wash out fish ponds, dry spells can limit freshwater habitat space, and fluctuating temperatures can stress out the fish themselves, just to name a few examples. To deal with these problems, small-scale fish farmers in these areas have begun turning to a resource called Climate Information Services, or CIS. The idea behind CIS is pretty straightforward: collect as much information as possible about an area's changing climate, and then make that information available to people who can use it to manage risks and problems. And the climate data comes from a few different sources. Weather
1:30 *Montage of clips including an animation of weather satellites in space, Hank Green speaking, a map highlighting Bangladesh, fishermen casting a net, and images of rivers overlaid with text.*	Weather forecasts and satellite imagery help scientists document changes over time in our atmosphere and water systems. Using that data, computer software can help identify patterns and predict what those patterns will look like in the future. Which is especially handy for fish farmers. When it comes to aquaculture, there aren't many places better than Bangladesh. The country has tons of freshwater systems and coastlines, making it a great place for raising fish and shrimp. This also makes seafood incredibly important both for the diet of everyday folk there, and for the economy of the entire nation. I'm talking like 5% of their GDP important. But Bangladesh is also at high risk for the negative impacts of climate change. In fact, it's been identified as the second most climatically vulnerable country in Asia for freshwater aquaculture. Behind only Vietnam, if you're curious.
2:17 *Series of videos including Hank Green speaking, fish swimming, and flooded roads in Bangladesh.*	On the bright side, there's been a lot of research recently looking into how Climate Information Services can help make Bangladesh's aquaculture more resilient. The first step is identifying the dangers fish farmers face. Rising water temperatures can stress out aquatic species and even cause die-offs. And erratic or unpredictable weather can lead to storms that can wash away harvests. In recent years, Bangladesh has seen an increase in dry spells and intense rainfall throughout the year, and aquatic food systems have been periodically damaged by powerful floods and cyclones. A study published in 2024 estimated that between the years 2011 and 2021, climate-related impacts caused aquaculture losses in Bangladesh equal to 1.4 billion US dollars. That's a lot of lost revenue, and a lot of lost food.

3:04 *Video of Hank Green speaking followed by videos of a woman walking through a field and people fish harvesting.*	And climate models predict that these impacts are only going to get worse over time. And That brings us to the next step: making this information available to people who can use it to solve problems. Using CIS, researchers work together with farmers to establish climate-smart procedures to make farming more resilient and sustainable. This includes monitoring the changing climate to determine the best times of year for stocking or harvesting food. Basically, creating a farm-friendly climate calendar. If farmers know ahead of time which seasons are now likely to see heat waves, dry spells, or heavy rains, they can plan around them. And that means preparing their fish ponds when conditions are just right, and harvesting their fish before a flood or drought ruins the stock.
3:46 *Clip of Hank Green speaking followed by a person feeding fish in a body of water.*	It can also include setting up procedures that trigger warnings based on the weather forecast. For example, if the forecast predicts temperatures or precipitation beyond a certain dangerous threshold, farmers can respond by adjusting the feeding schedule or making changes to ensure the health of the pond. With the right information, these procedures can even be tailored to the needs of specific species of fish or shrimp. It doesn't take much to make a huge difference.
4:10 *Series of images of water overlayed with texts followed by Hank Green speaking.*	Aquatic food is already a major source of food for people in Bangladesh - it's about 60% of the animal protein eaten in the country! And it's a major economic product - more than 10% of the country's population works in aquaculture. That's a lot, it's a big country too. One study estimated that an increase in aquaculture production of just 1% could provide more than 20,000 extra tons of fish per year. That's enough protein for a million people! And all that extra fish would be especially great for poorer communities. More available fish means more affordable food, and that's an incredible change for people who might already be struggling to get what they need.
4:47 *Video of Hank Green speaking followed by an image of a radio tower.*	But when it comes to managing climate problems, it's not just about what you do, it's also about who you know. Scientists are developing ways to connect farmers directly with climate experts, and to set up communication systems for remote areas, to make sure that everyone has the best access possible to up-to-date information. Research has found that radio and television are great ways for farmers to get their weather and climate info, but farmers in remote areas might not always have access to this information from a reliable source … or in a language they understand.
5:17 *Series of videos of a hand adjusting a radio's frequency, Hank Green speaking, cars driving down a flooded road, and a man walking through a field.*	Some areas have seen good results from developing specialized radio programs or organizing radio listening clubs for farmers to get the information they need. Of course, Bangladesh isn't the only place in need of these services, and it's not the only place scientists are hard at work. Other projects are working on technologies for improved flood warning systems in Asia, and for delivering up-to-date climate information to farmers across Africa, just to name a couple of examples. Our climate continues to change, and some of the worst impacts are being felt by people who work directly with the environment, like fish farmers. But thanks to Climate Information Services, the forecast for these people is much brighter.