

EARTHQUAKE RISK IN BANGLADESH

PASSAGE ONE

Background

A major earthquake can destroy any town. Imagine the damage it could do to a huge city, where millions of people live in poorly made buildings. Now imagine this city is also threatened by natural hazards like flooding and rising sea levels. These are the dangers that face Dhaka, the capital of Bangladesh. Scientists predict a major earthquake in the region. It's been more than 100 years since the last one so Dhaka is not prepared.

Today, a team of scientists is investigating the active geology behind earthquakes in Bangladesh. The project is led by Michael Steckler and Leonardo Seeber from Columbia University's Lamont-Doherty Earth Observatory, and includes international and local scientists. These scientists represent a range of specialties, such as seismology (earthquakes), structural geology (rocks and tectonic forces), and sedimentology (sediments and past environments). Together, they are studying the country's past and present geological events — from shifting faults to changing river patterns — to help people in Bangladesh prepare for the next major earthquake.

THE CENTER OF THE ACTION

Bangladesh is a country in South Asia bordered by India, Bhutan, and Myanmar. It sits on the Bay of Bengal and its capital city, Dhaka, is located in the Bengal Delta. ©AMNH / Google Earth



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Background**Bangladesh: A Land of Extremes**

Bangladesh is a small country in south Asia. Its geography makes it unlike any other place on Earth.

To the north of Bangladesh are the Himalayas, the *world's largest mountain range*. Three great rivers — the Brahmaputra, Ganges and Meghna — flow from the Himalayas and other nearby mountain ranges and merge in Bangladesh. These rivers deposit huge amounts of mud and sand. All this sediment forms the *world's largest delta*.

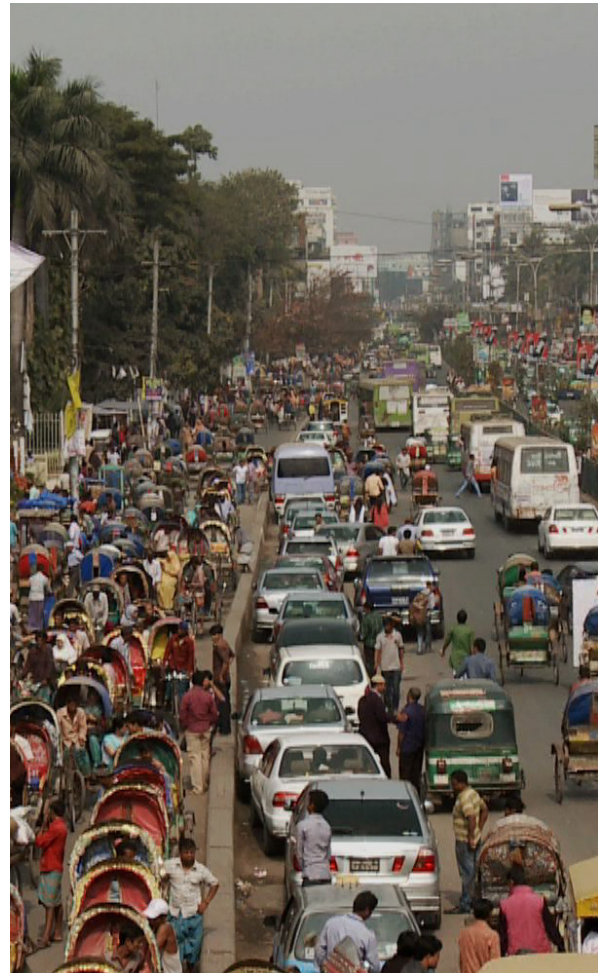
Bangladesh is also one of the *rainiest* places on Earth. During monsoon, the rainy season, heavy rains can flood more than half the country. But there are benefits to these floods. They help fertilize crops like rice paddies and turn low-lying fields into fishing areas.

Finally, Bangladesh is the *most crowded* place on Earth. Imagine more than half the U.S. population — over 160 million people — living in an area the size of Iowa. A large number of the people in Bangladesh live in huge cities like the capital city of Dhaka.

Dhaka: Danger Zone

With more than 13 million people, and an average of 45,000 people per square kilometer, Dhaka is one of the world's most crowded cities. And it's expanding quickly. "The city has grown out very fast, like a mushroom," says Humayun Akhter. Many of these new buildings, bridges, and roads are not built to hold up in earthquakes. The soft, wet delta soil makes them even more vulnerable. An earthquake could also spark a tsunami or cause rivers to overflow, which could flood the city.

Scientists and officials in Bangladesh hope to update and enforce building codes, educate people about how to prepare for earthquakes, and train rescue workers. They also want to prepare surrounding areas,

**A TIGHT SQUEEZE**

As the crowded city streets of Dhaka illustrate, Bangladesh is the eighth most populous country in the world with over 160 million citizens. ©AMNH

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Background

especially near rivers. A major earthquake could shift a river's course and lead to widespread flooding.

Forces Beneath Bangladesh

Bangladesh isn't shaped by just rivers and flooding. It's also shaped by what's happening beneath the surface, where tectonic plates are shifting. Bangladesh is one of the *most tectonically active regions* in the world. It sits where three tectonic plates meet: the *Indian Plate*, the *Eurasian Plate*, and the *Burmese Plate*.

The *Indian Plate* is moving northeast, slowly colliding with the Eurasian Plate. This collision formed the Himalayan Mountains — and they are still rising. There are many active faults along this boundary, such as the enormous Dauki fault that borders northern Bangladesh. Movement along this fault formed the large Shillong Plateau. To the east, the Burmese Plate pushes west against the Indian Plate. As the the India plate subducts beneath the *Burmese Plate*, rocks fold and buckle to form the hills and valleys of the Burma Arc.

Of course, active faults can also generate huge earthquakes. The devastating 2004 earthquake and tsunami in Sumatra occurred along the boundary between the Indian and Burmese plates. Scientists think that a major earthquake closer to Bangladesh is only a matter of time.

**GEOLOGY
IN ACTION!**

Bangladesh sits at the junction of the Indian Plate, Eurasian Plate, and Burmese Plate. ©AMNH

STOP AND THINK**BASED ON THE TEXT:**

1. What factors lead to the likelihood of a major earthquake in Bangladesh?
2. What are some of the societal implications of a large earthquake in this area?

LOOKING AHEAD:

3. What data should scientists collect in order to support their claim that a large earthquake may occur near Dhaka?
4. What methods do you think they should use to collect data?