

# HOW AFRICAN SAHARA AMPLIFIED A DROUGHT IN ASIA

Relevant for: Environment | Topic: Environmental Degradation - GHGs, Ozone Depletion and Climate Change

Paleolithic study: Kathleen Johnson carries her caving gear across a river, exiting a cave in Laos.

About 4,000 to 5,000 years ago, a severe drought crippled countries of Southeast Asia forcing a shift in human settlement patterns of the area. Researchers have now told the story behind this mega-drought. By studying the mineral deposits of caves in Vietnam they point to a connection between the end of the Green Sahara and this mega-drought.

The team collected stalagmite samples from the caves in Laos and examined the oxygen, carbon isotopes and trace metals. They also conducted different modelling and paleoclimate experiments. The data suggested that during this period the Sahara started losing its vegetation. The reduced plant growth led to increased airborne dust which cooled the Indian Ocean, shifted the atmospheric circulation patterns and caused a condition similar to today's El Niño events.

This ultimately led to a large reduction in monsoon moisture across Southeast Asia that lasted more than 1,000 years, says Kathleen Johnson in a release. She is an associate professor of Earth system science at the University of California and one of the corresponding authors of the paper published in *Nature Communications*.

Previous studies have shown that this demise of the Green Sahara also caused the collapse of the Akkadian Empire of Mesopotamia and the de-urbanisation of the Indus Valley Civilization.

This mega-drought period also brought about many lifestyle changes in the mainland Southeast Asian countries of Myanmar, Thailand, Laos, Cambodia and Vietnam. The first appearance of cultivated cereals - millet in central Thailand and rice in northeast Thailand were during this period. It also introduced the nucleated village agrarian lifeway. Studies of ancient DNA sequencing of human genomes have also pointed to population changes in mainland Southeast Asia about 4,000 years ago leading to some emigration in the region.

"Archaeologists and anthropologists have been studying this event for decades now, in terms of societal adaptations and upheavals, but its exact cause has eluded the scientific community," said lead author Michael Griffiths in a release. "Results from this work could help us better understand, to varying degrees, the observed societal shifts across many parts of the tropics and extratropics." He is a professor of environmental science at William Paterson University, New Jersey.

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