

March 14, 2023 [Environment, In the Lab](#) By [Neha Jain](#)

Sea Level Rise Drove Early Human Migration In Southeast Asia

Research shows that rising sea levels around 20,000 to 6,000 years ago along with population pressure forced the early inhabitants of Southeast Asia to migrate to South Asia.



AsianScientist (Mar. 14, 2023) – Rising sea levels driven by human-caused climate change are already impacting communities living in coastal areas, and these impacts are expected to get worse in future, especially in resource-starved Asian countries. But

communities in Asia have experienced such a rapid rise in sea levels in the past too. From the Last Glacial Maximum period (approximately 26,000 to 20,000 years ago) to the mid-Holocene period (approximately 6,000 years ago), global sea levels rose 135 metres, flooding half of the Sundaland continental shelf, a large landmass of rainforests and coastal mangroves, which included the Malay Peninsula and the islands of Sumatra, Borneo and Java.

As a result of the reduced land area and rising population that followed, people from these regions were forced to migrate to South Asia and Mainland Southeast Asia, shows a recent study published in *Nature* by a team of scientists from Singapore, Canada and the United States. The researchers used a combination of paleogeographic and population genomic analysis to study the migration pattern of early settlers in South Asia.

Using historical data, the team constructed paleogeographical maps of sea level changes dating from 26,000 years ago to the present. The team also analyzed whole-genome datasets from the nonprofit organization GenomeAsia 100K, an initiative that aims to shed light on the genome diversity of Asian ethnicities by sequencing 100,000 genomes of people living in Asia. Genomes from 59 ethnic groups native to Southeast and South Asia from 50,000 years ago were analyzed to infer the human population history. Unlike other population history studies that use mitochondrial DNA, which is inherited from mother, whole-genome sequence data comprises DNA from both mother and father.

“GenomeAsia 100K systematically generates maps of Asian human genetic diversity, including indigenous ethnicities who have occupied the region for a long time,” said Stephan Schuster, professor at the Nanyang Technological University’s (NTU) School of Biological Sciences, and Scientific Chair of GenomeAsia 100K. “Integrating those maps with paleoclimatic data allows us now to understand exactly how past climatic events have resulted in ancient human migrations, as well as their impact on today’s population structure.”

The indigenous tribes of the Andaman Islands, Malay Peninsula, Thailand and Philippines, referred to as Andamanese, Malaysian and Philippine Negritos, respectively, are the present-day descendants of the early inhabitants of Sundaland. The study found that from the Last Glacial Maximum to the mid-Holocene, two periods of rapid sea level rise reduced the land area of Sundaland by over 50 percent, causing it to split into smaller islands. That broke land bridges between Palawan, Borneo, Sumatra, and the Malay Peninsula, forcing the communities in these areas to disperse and segregate into smaller groups. This event was followed by temperature increase and the favorable environment led to a surge in population density in Southeast Asia by over eight times from the Last Glacial Maximum. This created immense population pressure on natural resources, causing the communities to migrate to new places for settlement.

Common genetic ancestry between Malaysian and South Asian indigenous groups revealed that the ancestors of Malaysian Negritos migrated northwards towards South Asia. They also migrated to Mainland Southeast Asia. But the proportion of gene flow from Malaysian Negritos to the South Asian Austroasiatic group is larger than to Mainland Southeast Asians.

“Our study found that the climate changes 20,000 years ago influenced to shape diverse ethnicities in Southeast Asians and drive their migration to South Asia that have changed the genetic profile of modern South Asians,” lead researcher Hie Lim Kim, assistant professor at NTU’s Asian School of the Environment and the Singapore Centre for Environmental Life Sciences Engineering, told the *Asian Scientist Magazine*. “It is important to understand this population history and genetic ancestry of each ethnic group to develop personalised medicine.”

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Source: [Nanyang Technological University](https://www.nanyang.edu.sg/) ; Image: Shelly Liew/ Asian Scientist Magazine

The article can be found at: [Prehistoric human migration between Sundaland and South Asia was driven by sea-level rise](#)

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