

EFFECTS FROM CLIMATE CHANGE ON SEASONAL MONSOON IN ASIA



Nowadays, climate change is one of the most discussed topics – and for good reason. In this article we'll look closer at how climate change impacts the seasonal monsoon in Asia, among others affecting travelers touring Asia. Essentially, the monsoon is renowned as the biggest climate regulating system in the world. The monsoon generates intensive rainfall on the Asian continent with the agriculture industry depending on it almost exclusively.

The Monsoon and the Increase of Carbon Dioxide in the Atmosphere

According to research, over the past 40 million years, the strength and trends of the monsoon rains have varied. The changes have been linked with the increase of carbon dioxide in the atmosphere – which has changed gradually and naturally over the course of time.

Research outlines that the monsoon system originates from a time in which the levels of carbon dioxide were three or four times what they are at present time. Afterward, it weakened as the levels of carbon dioxide were reduced with Earth entering into the ice age.

To that end, scientists outline that there is an inbound link between the strength of the greenhouse effect and the monsoon in Asia. The monsoon may be, in truth, more sensitive to climate change than scientists have thought in the past.

Difference in Temperatures

The monsoon is triggered by the contrasting temperatures between the adjoining oceans and Asia. Evidently, in comparison to water, land warms and cools much quicker and thus provides pressure into the atmosphere.

During summer, when the land is naturally warmer than the sea, winds blow over the Indian Ocean towards the land, generating heavy rains from June to September. The rain intensifies in the areas with higher altitudes – as happens in southwest India, for instance.

With the coming of fall, the land cools. Thus, the wind brings warm air over the Asian continent during the winter.

So, how is this expected to change the monsoon season as we know it?

For one thing, as the increasing temperatures will warm the land at a faster pace, this will, in return, increase the temperature contrast with the oceans. What is more, if the atmosphere is warmer, that means it can hold more water vapor. Concurrently, according to projections, the wind patterns are also prone to change with climate change. Hence, the monsoon season will most likely start earlier and finish later.

That being said, scientists anticipate the Asian monsoon to intensify during the 21st century. Literally, everything about the monsoon is changing – not only the intensity of the rainfall but also the frequency and spatial distribution, as well as the duration of the rainfall.

Other Important Considerations

However, there are other elements that could influence the monsoon climate – namely the lifeline of South Asia, which is responsible for generating more than 80 percent of the annual rainfall to the region. Simultaneously, we shouldn't overlook the impact of El Nino and La Nina.

What is more, the warming and cooling temperatures of the Indian and Atlantic Oceans shouldn't be neglected – with the Atlantic Nino and the Indian Ocean Dipole.

Evidently, all these factors play a part, but it is yet to be determined to what extent, and how precisely. However, the long-term rainfall decline is, without a doubt, worrisome, especially if we were to consider that the oceans warm-up due to climate change.

All in all, it is clearly observable from future model projections that the rise in greenhouse gas concentrations contributes to increasing the seasonal average monsoon rainfall in South Asia. Nonetheless, there are still many uncertainties – and scientists cannot predict what parts of the continent are prone to be more affected since the picture is still widely uncertain.

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