

THE IMPACT OF CHANGES IN DISCHARGE OF AMAZON ON THE CLIMATE OF THE ATLANTIC OCEAN

The Amazon river has a profound impact on global climate because it discharges around 6600 cubic kilometre of water per annum into the Atlantic Ocean. Global warming will alter the precipitation pattern in South America and hence will alter the amount of water discharged into the Atlantic Ocean. How will the variations in the discharge of the Amazon river alter the regional climate in the Atlantic Ocean?

Prof. Vinaychandran and Ravi Nanjundiah at Divecha Centre for Climate Change and doctoral student Jahfer Sharif at Centre for Atmospheric and Oceanic Sciences, Indian Institute of Science examined this issue through simulations in a coupled ocean-atmosphere model. They simulated the impact under two extreme scenarios. The first one was a complete shutdown of the discharge into

the Atlantic Ocean and the second was doubling the discharge of Amazon river into the Atlantic Ocean.

Their simulations showed that the discharge of water from the Amazon into the Atlantic Ocean has a major impact on the location of the tropical rain band in the tropical Atlantic Ocean during July and August. When there is no discharge of water into the Atlantic the rainfall band (called Inter-tropical Convergence zone or ITCZ) moves northward in July and if the discharge is doubled the rainfall band moves southward in August. The movement of this tropical rainband will lead to changes in rainfall pattern in West Africa.

Reference: S. Jahfer, P. N. Vinaychandran and Ravi S. Nanjundiah, Environmental Research Letters, 15, May 2020

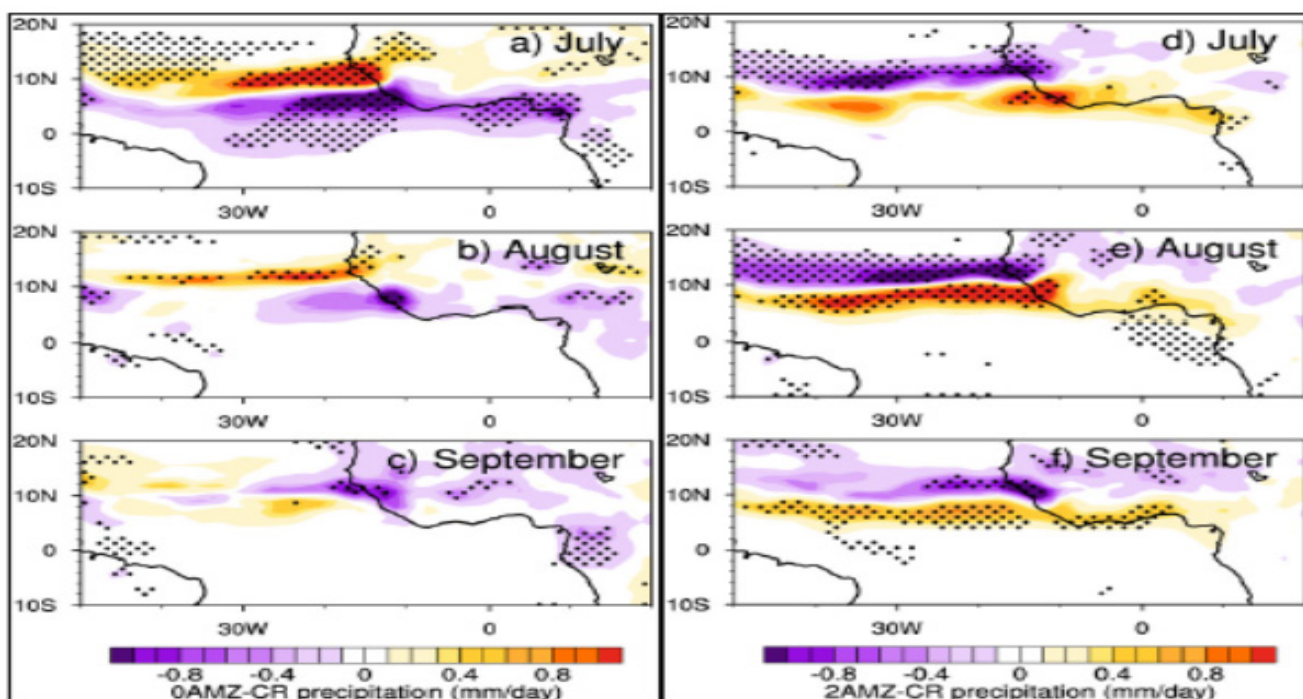


Figure: The impact of no discharge from the Amazon river on rainfall is shown in the left figure while the effect of doubling the discharge from Amazon is shown in the right figure.