

Climate Risk Management Strategy in the Tropics – Exploiting Regional Heterogeneous Rainfall Response Introduced by El Niño Tele-connection

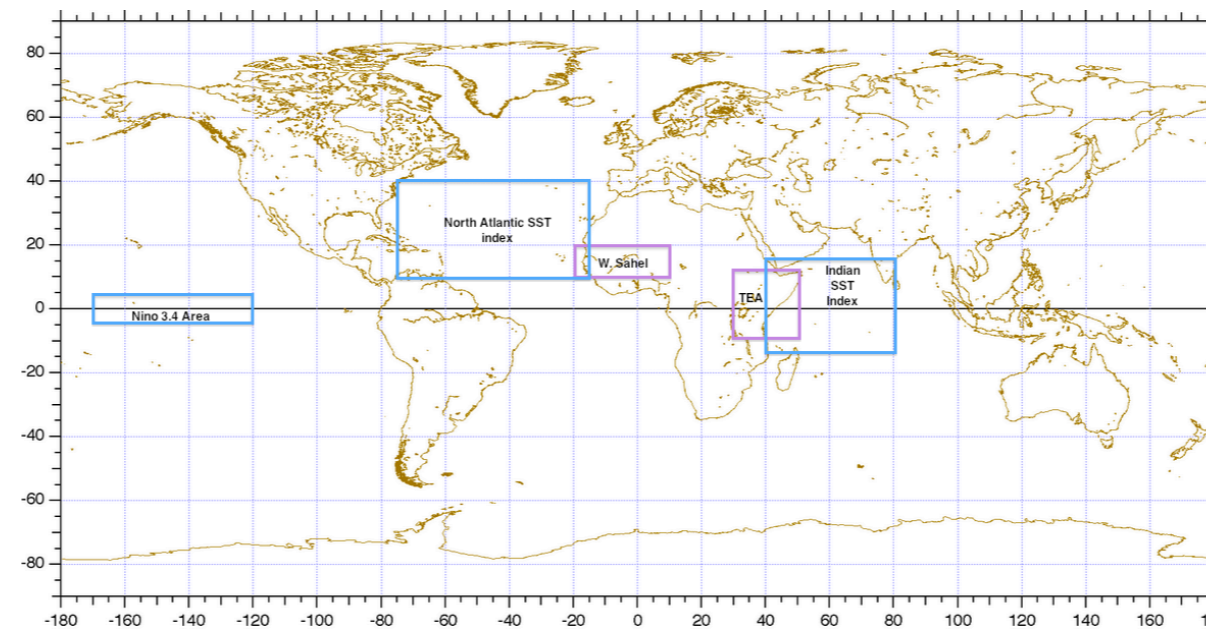
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Introduction

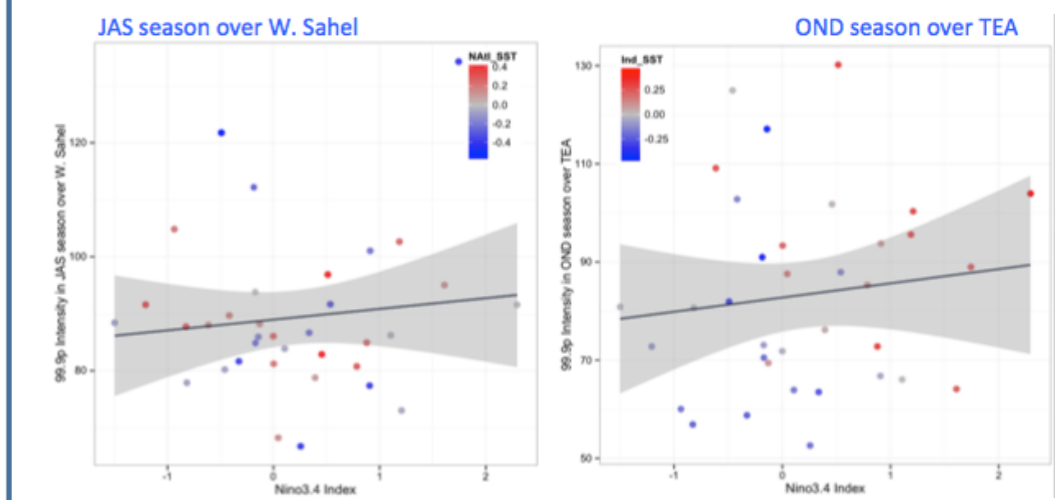
Climate variability and change pose significant risk to the sustainable development of Tropical low and medium income countries. Risk pooling and sharing across the tropical countries could be an effective tool to manage such risks by providing ex-ante financing in time of need. These countries usually have less financial resources to raise risk capital efficiently at a cheaper cost from global financial institutions- e.g. reinsurers or capital markets. Can we leverage climate science research to design a better risk pooling strategy to lower the risk premium and increase affordability?

W. Sahel vs. Tropical Eastern Africa



Modulation of Extremes

Extreme rainfall (99.9 percentile) does not show significant contrasting modulation over both regions.

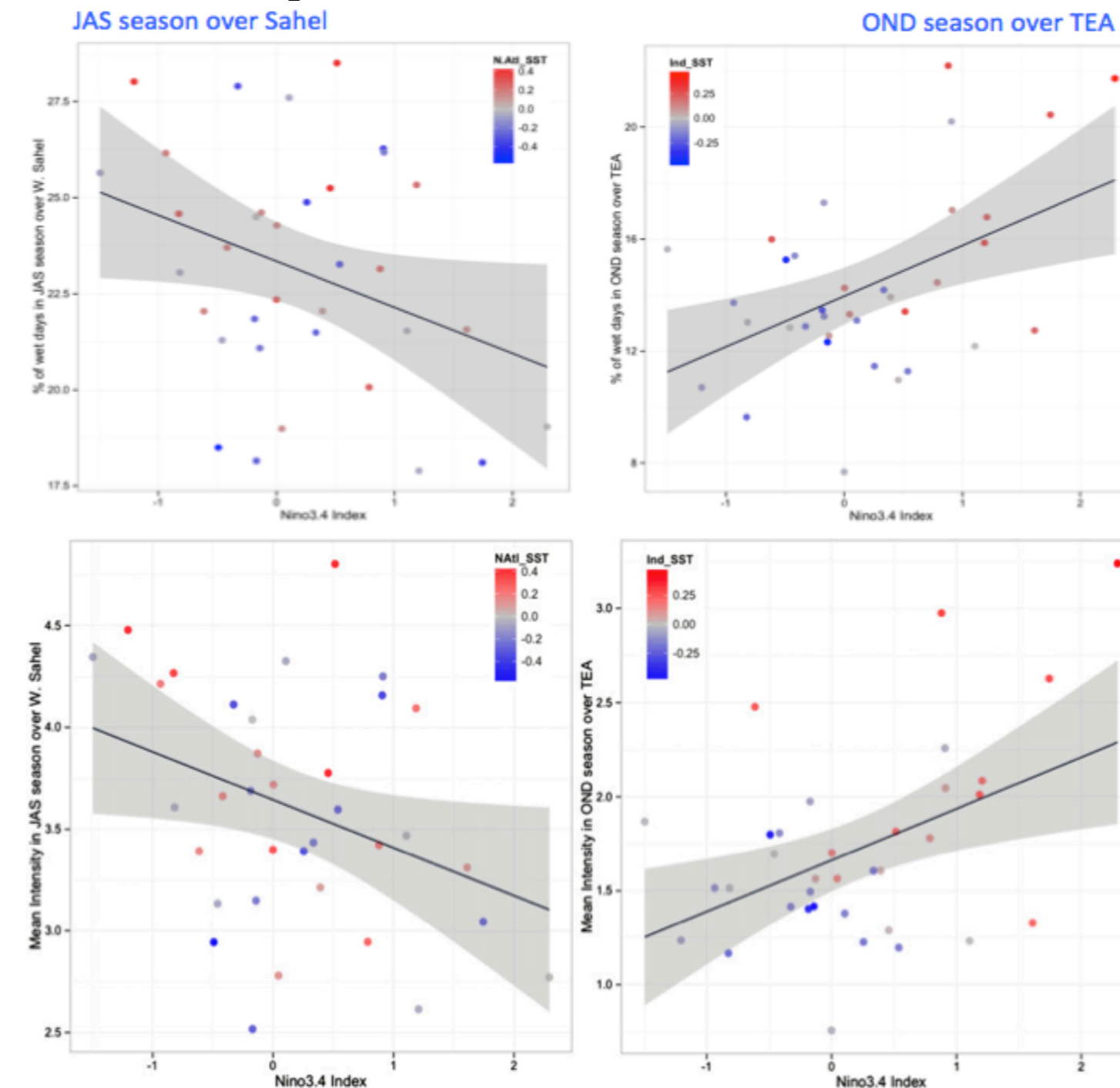


Loss as % of GDP

Year	Natural disaster	Country	Region	Direct loss (US\$ million)	Direct loss (% of GDP)
Large Economies					
2005	Hurricane (Katrina)	USA	North America	125,000	1.1%
1995	Earthquake	Japan	East Asia	100,000	3.2%
1998	Flood	China	East Asia	30,000	0.7%
2004	Earthquake	Japan	East Asia	28,000	0.8%
1992	Hurricane (Andrew)	USA	North America	26,500	0.4%
Small Island Economies					
1988	Hurricane (Gilbert)	St. Lucia	Caribbean	1,000	365%
1991	Cyclone (Val and Wasa)	Samoa	Oceania	278	248%
2004	Hurricane (Ivan)	Grenada	Caribbean	889	203%
1990	Cyclone (Ofa)	Samoa	Oceania	200	178%
1985	Cyclone (Eric and Nigel)	Vanuatu	Oceania	173	143%

Source: CRED EM-DAT database, World Bank (2006a).

Contrasting Response of Frequency of Wet Days & Seasonal Mean



Finding

- Over the W. Sahel and Tropical Eastern Africa, the El Niño tele-connection is primarily associated with the decrease and increase in both seasonal mean and number of wet days respectively.
- Unlike the frequency of wet days or seasonal mean rainfall, daily mean, median, and extreme (99.9th percentile) rainfall intensities are not modulated over both the W. Sahel and TEA.

Suggestion

Climate Risk Pooling across 2 regions (W. Sahel & Tropical Eastern Africa) and seasons (JAS and OND) can provide diversification benefits for climate indices such as number of wet/dry days or seasonal mean, but not for daily extreme rainfall.

Reference

Parhi P., Giannini A., Gentile P., Lall U., Resolving contrasting regional rainfall responses to El Niño over tropical Africa, *Journal of Climate*