Seasonal forecasting and the predictability of the rainy and dry seasons for Peru, Tanzania and India

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With seasonal forecast models we investigate whether it is possible to give the people in Tanzania, Peru and India time to adapt and prepare to different weather conditions. In recent years, these countries have repeatedly experienced devastating droughts or floods, such as in East Africa in November 2019.

Under the framework of the research project EPICC (East Africa Peru India Climate Capacities) supported by the BMU (Federal Ministry for the Environment, Nature Conservation and Nuclear Safety), we aim to set up a seasonal forecast system. The goal is to make the data useful for the hydrologists at the project partner from PIK (Potsdam Institute for Climate Impact Research) for integration in a tool for adaption in local agriculture in the affected countries (India, Peru and Tanzania). In this study, we validate a number of variables of predicted anomalies in seasonal forecast models as well as of a multimodel product.

There are different methods of seasonal predictability, based on slow variations of boundary conditions, coupled ocean-atmosphere model simulations as well as the concept of ensembles, multi-model ensembles and uncertainties. The focus in this study is on the intercomparison of the single models and the multimodel in a forecast range between 1 and 6 months. In particular, we investigate three-month mean deviation from the long-term mean. It is important for the population (especially for the agriculture industry) in the focus region to know whether in a certain period (rainy season, dry season, El Nino etc.) the next 3 months will be colder, warmer, drier or even wetter compared to the long-term mean.

Due to the fact, that various seasonal forecasting models perform differently, it is the challenge, to find the best fitting seasonal forecast model for each of the affected countries.