

The Impact of Climate Variation on Rice Paddy Flooding and Rice Arsenic in Cambodia

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Rising levels of arsenic in rice is an increasing concern in Asian countries. For millions of people in these countries rice is not only the majority of their daily calories but it also provides a source of income. Rice arsenic concentrations are frequently high when water covers rice paddies, resulting in anaerobic conditions and iron reduction, which releases arsenic from soil into the water, which then can go into rice. The purpose of this research is to establish a relationship between climatic conditions and the amount of rice paddy flooding, so we may better understand the potential impacts of climate change has on the arsenic contamination in rice. This research was conducted by analyzing precipitation data in the region of Cambodia from both remote sensing and weather stations for the last 3-5 decades. This data was modelled and compared to flooding imagery in order to create projections for the amount of flooding based on the amount of precipitation. During the project we concluded that the data from weather stations had many gaps than the data obtained from remote sensing. Using remotely sensed PERSIANN data, we observed long-term decreasing trends in precipitation for the region, with short term variation in rainfall attributed to El Niño climatic variation. Overall precipitation did appear to affect flooding extent, but without a clear quantitative relationship between observed flooding and rainfall. This study will assist in providing a better understanding on the impact of climate change on arsenic in rice. Since we know that the amount of water affects the arsenic levels in rice any projections will be extremely helpful in monitoring the levels and creating counteractive measures for the future.