

## **Effect of climate change on the disease biology of vector-borne helminth diseases in Africa**

Changing climatic conditions play an important role in the spatial-temporal distribution of neglected tropical diseases in both man and animals. The distribution of helminth diseases, including snail borne diseases such as schistosomiasis, fasciolosis and paramphistomosis, is likely to change as a result of the current changes in climatic and environmental condition, but there is a severe lack of in-depth studies on the subject.

The present PhD-project offers an opportunity to study the effect of climate change on transmission of vector borne helminth diseases in man and/or domestic animals in Africa. It is the intention to base the study on a biology-driven model including climatic, environmental and biological data from regional and more locally based surveys. The study will be carried out using GIS and Remote Sensing techniques, and will include a number of geospatial statistical modelling tools, such as Bayesian statistics.

In the past, most of the studies in Africa have focused on the impact on malaria, predicting that it will spread to higher altitudes previously considered too cool for the survival and transmission of the malaria parasite. But climate change will also affect transmission of a number of helminth diseases especially schistosomiasis in man and fasciolosis and paramphistomosis in domestic stock by influencing distribution and behavior of the snail host and the parasite. The transmission dynamics are most susceptible to the effect of climate change around the limits of current disease distribution. Schistosomiasis is a serious health problem in sub-saharan Africa, second only to malaria among the parasitic infections. Fasciolosis and paramphistomosis cause severe problems for local farmers decreasing their profit on livestock production as well as for subsistence.

A qualitative study carried out to assess the effect of climate change on schistosomiasis transmission in Zambia has already concluded that schistosomiasis transmission will be affected. However, the study was hampered by lack of disease data and no disease modelling was carried out.

The PhD study shall thus aim at determining the potential impact of climate change on helminth diseases especially schistosomiasis, fasciolosis and paramphistomosis transmission using biology based models, optimized environmental and diseases distribution data.

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