Capacity gap analysis

State-of-the-art

The capacity gap in the project area is analyzed versus the state-of-the-art of EO applications and statistical modelling for malaria vector control.

Earth observation has often been used for the surveillance, monitoring and early warning of vector borne diseases that are closely related to environmental conditions. Bayesian statistical modelling is used to identify significant environmental predictors and provide predictions of malaria transmission based on the mathematical descriptions of the environment-disease relations. Environmental predictors can be derived via satellites. Bayesian statistics are able to estimate simultaneously the malaria-climate relation and the spatial correlation.

End-user questionnaire

The end-users are surveyed to measure their interest in EO-based products for malaria control. The actual personnel skills and infrastructure to work with GIS, EO and spatial statistics techniques are surveyed as well. The difference between the required skills and the actual skills is the gap.

EO monitoring solutions

MALAREO is unique in addressing the use of high resolution data for spatial modelling of malaria risk on the one hand, and the direct support for malaria control actions on the other hand.

Recent land cover information is collected using High resolution (HR) imagery and used as environmental predictors for vector presence and modelling malaria transmission. Very High Resolution (VHR) data is used to collect information on the type, amount and distribution of houses. Detailed house maps are of high interest for MCP’s for planning the vector control Indoor Residual Spraying (IRS) campaigns.

The image on the upper-left shows an area in Swaziland which was subject to a malaria outbreak in 2011. The outbreak took place just outside the IRS area. There seems to be an important link between the outbreak location and the land cover change from natural woodland to sugar cane plantations. The invasion of sugar cane can lead to the extension of malaria risk areas via secondary transmission; sugar cane is permanently irrigated, causing an important increase of potential breeding sites. The work on the plantation attracts workers from outside the area, they bring along the risk of importing malaria in the area.

Capacity building

In the second phase of MALAREO, capacity building practices in GIS, remote sensing and spatial statistics are planned. On the long term, the project aims to initiate the establishment of a local EO training and monitoring centre in support of the MCP’s in Southern Africa.