



## EAG-GS Outreach Program 2013

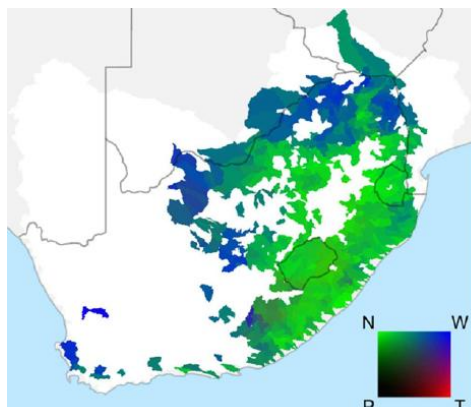


### Seminar Abstract:

### Water and nutrient supply for agriculture

Bernhard Wehrli, Swiss Federal Institute of Technology, ETH Zurich and Eawag, Swiss Federal Institute of Aquatic Science and Technology, Switzerland. [wehrli@eawag.ch](mailto:wehrli@eawag.ch)

Smallholder farmers in several parts of Sub-Saharan Africa are facing the critical challenges of high rainfall variability and low soil fertility. General water scarcity and high costs and often preclude installing complex irrigation systems. Rainwater harvesting is a potential low-cost alternative providing limited water supply to overcome dry spells during critical phases of plant growth. Long transport distances and high costs are similar obstacles to use industrial fertilizers. Ecological sanitation or mixed plantations offers improve the nutrient re-cycling and supply at the local scale. GIS –based models such as the “soil-water assessment tool”, SWAT coupled to agricultural models are useful for identifying the critical resources over large geographical areas. In this seminar we first look at the necessary data sources, and the relevant



Constraints on smallholder maize production in Southern Africa

W: Water  
N: Nitrogen  
P: Phosphorous  
T: Temperature

Critical factors for maize production (from Andersson et al., 2013)

hydrological and biogeochemical processes. Then applications to water and nutrient needs in agriculture the context of the Zambezi River Basin and in Southern Africa will be discussed. The results provide a spatially explicit analysis of water and nutrient deficiency for growing staple foods under different rainfall scenarios. Such scenarios help to inform the stakeholders and to set priorities in agricultural development.

Andersson J.C.M., Zehnder A.J.B., Wehrli B., Jewitt G.P.W., Abbaspour K.C., Yang H. 2013. Potential impacts of water harvesting and ecological sanitation on smallholder crop yields, evaporation and river flow regimes in Southern Africa. *Env. Sci. Technol.* 47(9), 4341–4348.