

Title: How Alexander von Humboldt's life story can inspire innovative soil research in developing countries.

Review by: Jozef (Seppe) Deckers

Overall comment:

This discussion paper is absolutely worthwhile. It is extremely well written and drawing from a wealth of top-class soil and land use research by the author and his teams of Wageningen University in many places of the world. It stimulates reflection among soil scientists on the importance of the inter- and transdisciplinary approach as well as engagement in society. The contrast between rather basic research conditions of soil scientists in 'Developing countries' is contrasted with the more sophisticated soil scientists of the 'Western' world. The author sees this translated into an opportunity for 'South countries' to do their research 'von Humboldt'-style, whereas the high-tech Western researchers risk to lose themselves into a reductionist approach, hence leading their science less meaningful. He also rightly points out that over-regulation in our society may compromise creative thinking, which is the essence of good science.

The author takes us through work done with his group in so-called 'developing countries' and illustrates how eco-regional research in that part of the world in the spirit of 'von Humboldt' will lead to good problem-solving science which is highly relevant for society.

The paper ends by providing 6 lessons learned from science in 'developed countries' for relating soil science to society – scope for leap-frogging in 'developing countries'

Specific comments/observations:

2.3. Integrated nutrient management in Africa, line 14 – 16: bypass flow is suggested to cause up to 60% loss of surface-applied nutrients on structured clay soils in Africa. Most probably the authors are referring to soil with vertic properties. In these soils, chemical volatilisation of applied nitrogen is also an important process leading to major nutrient losses, especially at high pH ranges, which often is the case with these soils.

2.4. Agricultural development in the West-African Sahel, line 10 – 14: surface sealing: it would be good provide a soil-geographical story-line here that the whole area is dominated by Lixisols, which are notorious for surface sealing. This process is enhanced by the fact that these soils have been dusted by silt which has been blown in from the Sahara by harmatan winds for millennia.