



CEPHaS8

Conservation Agriculture Perspectives

Photo taken by A. J. Ssembajja

Dr Geoffrey Heinrich started his professional career conducting field research on watershed management systems in India. Subsequently he spent 20 years conducting on-farm farming systems research with smallholder farmers in southern Africa —first as an Associate Professor for Kansas State University then as a scientist and senior manager with the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). Geoff joined the Catholic Relief Services (CRS) in 2004, and since then has been providing technical advice to CRS country programs and working to develop improved programming approaches for rural livelihoods.

Over the last decade Geoff has become increasingly concerned about the major negative impacts that land degradation is having on rural livelihoods in the developing world. For this reason, he has been working specifically to find profitable and practical approaches through which farmers and communities can improve the health and productivity of their farms and landscapes. Geoff was also recently appointed as a Senior Fellow for the Global Evergreening Alliance.

Geoff has a Bachelor of Science degree and a Master of Science degree in Crop and Soil Science from Michigan State University, and a PhD in Agronomy from the University of Nebraska – Lincoln.

1. What are the main ways in which you have seen smallholder farmers adapting to climate change in southern and central Africa in recent years?

The smallholder farmers that I visited in southern Africa in the years before the COVID lock-downs did complain about changes in weather patterns, such as a later and later start to the rainy season, and the greater variability in rainfall patterns. They did not however seem to be adopting any specific strategies in response to these changes. For example, we saw essentially no move away from maize to more drought-tolerant crops, no increase in the adoption of Conservation Agriculture (CA) and no increase in the purchase of seed of early maturing varieties (except possibly for maize varieties, but for other crops, farmers continued to use their own saved seed). The one area in which our participating farmers reported sustaining new activities in response to climate change was in the maintenance of watershed management structures in Malawi. This was reported by farmers/communities that participated in the watershed management pilot component of the USAID-funded WALA project in southern Malawi 2009–2014¹. In 13 out of 14 locations evaluated 7 years after the close of a project that introduced the concept of watershed management to communities, the communities were maintaining the structures (contour bunds, rainfall infiltration pits, stone bunds, gully plugs, etc.). One of the reasons that they gave for maintaining the structures was their observation that this process increased rainfall infiltration into the soil, and increased soil moisture available for plant growth, as well as recharging the groundwater tables. My experience is that natural resource management at the landscape scale is where the greatest impacts can be generated to combat climate change.

2. Do you think that smallholder farmers are able to contribute to climate change mitigation through the way they manage their systems?

Absolutely yes, but as noted above, I believe the best way for them to do this is through the proper management of their natural resource base as a whole, and not to concentrate only on changing production systems within individual farms. The communities we worked with that were successful in doing this had community-level Natural Resource Management Committees (NRMCS). These NRMCS developed by-laws for natural resource management, and the by-laws were enforced and upheld by the local traditional authorities. The overall impacts on the communities were completely transformative in a good number of cases.

¹ Bascom, Sebastian; Kaplan, Emily; Olivier, Lauren; Ssembajja, Arthur. 2021. Scaling and Replicating Sustainable Watershed Management: A Malawi Case Study. A research report prepared for CRS by the University of Notre Dame, Keough School of Global Affairs. Unpublished research report on community-managed watershed management sites piloted in the USAID-funded WALA project 2009–2014. Report available from CRS-Malawi

3. How might smallholder farmers be incentivized in the short-term to adopt farming approaches, which are both adaptive to climate change, but also mitigating?

Farmers and communities involved in the watershed management activities described above indicated that the best way to convince others was through 'look and learn' visits. But it was also noted that 'short-term incentives' were also useful to get the initial development work done (e.g. 'Food for Work' government assistance programmes), and that it was a prerequisite for the communities to have the necessary tools available to do the required maintenance work over years. Lastly, communities indicated that it was important to have 1) strong positive leadership and 2) a capable extension agent present to provide technical assistance.

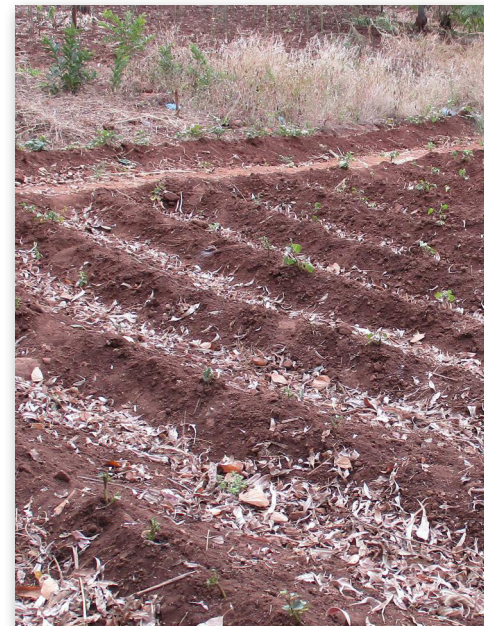
4. What do you think are the main research questions that need to be addressed to support food security and climate change mitigation in sub-Saharan Africa?

First and foremost, I feel we should move away from a rather myopic focus on 'farming practices' and look at a combination of farm- and landscape-level interventions that will be effective in reversing the terrible land degradation that is happening in almost all of sub-Saharan Africa at the moment, and look at systems that will rebuild the soil health and productivity, and significantly increase water resources at field and landscape levels. Instead of telling farmers what we believe to be the best ways to use these resources, we should look for systems that will build their capacity to identify and solve their own issues and questions, and also build their capacity to engage effectively with markets. Effective systems for doing all of the above are in the development stage at the moment. For example, the 'Farmer Learning Center' approach that was first developed by the University of Zimbabwe, and subsequently advanced by CRS in Zimbabwe and Malawi. The advances came from adding training modules on both the 'Innovations' skill set and the 'principles of natural resource management (soil, water and ecosystems)'. These skill sets are part of the CRS SMART Skills, and manuals for these trainings can be found on the CRS website. Another approach for enhancing farmers' engagements with markets was used successfully in the USAID-funded UBALE project (CRS led, 2014–2019 southern Malawi). In this project CRS collaborated with a farmer cooperative to form Marketing Clubs (ca 20 farmers) and Marketing Clusters (ca 8–10 Clubs). The Clubs and Clusters were supported by community-based and project-trained 'Marketing Agents'. The purpose was to support farmers in collective marketing of their products and collective purchasing of inputs — to get better prices for both. The Marketing Agents were paid by commissions on output sales (paid by the farmers) and commissions on input sales (paid by the wholesale companies). By the end of the project over 69,000 farmers were participating in these groups, supported by a little over 350 Marketing Agents.

Investing in research to refine and/or confirm the effectiveness of these approaches could be transformative over the next decade. 'Business as usual' certainly will not be any more effective in the next decade than it has been up to now . . .



A modified water absorption trench in an agricultural field is fortified with pigeon peas planted on the overflow embankment (Source: Bascom et al. 2021).



Marker ridge farming technique introduced by WALA that helps to retain water in the soil (Source: Bascom et al. 2021).

To find out more, visit our webpages at <https://www2.bgs.ac.uk/CEPHaS> and follow us on twitter @CEPHaS_Soil



CEPHaS is funded by UK Research and Innovation through its Global Challenges Research Fund programme.

