A smallholder level decision support system improves resilience to climate change

Submitted by Erna Kruger (Director Mahlathini Development Foundation - MDF) Ph: 0828732289, Email: <u>info@mahlathini.org</u> Web: <u>www.mahlathini.org</u>

Partners: Erna Kruger, Mazwi Dlamini, Samukelisiwe Mkhize, Temakholo Mathebula, Phumzile Ngcobo, Betty Maimela, Sylvester Selala and Lulama Magenuka (MDF)
Palesa Motaung, Nonkanyiso Zondi, Snadile Madlala, Khetiwe Mthethwa, Andries Maponya, Nozipho Zwane, Lungelo Butehelzi, and Zoli gwala (students and interns)
Mr Lawrence Sisitka (Research Associate- Environmental Learning Research Centre- Rhodes University)
Mr Nqe Dlamini (StratAct)
Mr Chris Stimie (Rural Integrated Engineering)
Mr Jon Mc Cosh, Ms Brigid Letty (Institute of Natural Resources)
Mr Hendrik Smith (CA coordinator for GrainSA)
Ms Sharron Pollard (AWARD)
Ms Lindelwa Ndaba (Lima RDF)
Ms Catherine van den Hoof (formerly of WITS Climate Facility, now the United Nations World Food Programme)

Abstract

Given South Africa's present trajectory and already alarming increase in temperature, the predictions of strongly increased drought, increased rainfall variability and strongly increased extreme rainfall events into the future are all but guaranteed (DEA 2017¹).

Small-holder farmers are being especially hard hit by these changes. Many of these small-scale producers are already coping with a degraded natural resource base. They often lack knowledge about potential options for adapting their production systems and have limited assets and risk-taking capacity to access and use technologies and financial services (SARVA, 2013²).

Processes such as collaborative, participatory research that includes scientists and farmers, strengthening of communication systems for anticipating and responding to climate risks, and increased flexibility in livelihood options, which serve to strengthen coping strategies in agriculture for near-term risks from climate variability, provide potential pathways for strengthening adaptive capacities for climate change (IPCC, 2014³).

Mahlathini Development Foundation and our partners and collaborators (Universities, NGOs, CSI initiatives, District and local Municipalities and Government Departments), have been working within the socio-ecological and social learning space to assist smallholder farmers in KZN, Limpopo and the Eastern Cape to improve their

¹ DEA (Department of Environmental Affairs). 2017. National Climate Change Adaptation Strategy Republic of South Africa. Pretoria. South Africa

² SARVA (2013). South African Risk and Vulnerability Atlas (Department of Science and Technology, Pretoria 2013)

³ IPCC (2014). Summary for Policymakers. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

resilience and adaptive capacity to climate change by designing and testing a participatory smallholder level decision support system for implementing climate resilient agricultural practices.

Within this process smallholder farmers explore and analyse their understanding of climate change and the impacts of these changes on their livelihoods and agricultural systems. They explore adaptive strategies and measures (local and external), prioritize appropriate practices for individual ad group experimentation and implementation, assess the impact of these new practices and processes on their livelihoods and re-plan their actions and interventions on a cyclical basis.

This allows them to make incremental changes over time in soil and water management practices, cropping and livestock management and natural resources management, over time, within the limits of their own resources, vision and motivation. This provides a viable model for CCA implementation and financing at smallholder level.

Recent participatory impact assessments have shown remarkable improvements in resilience in the space of just 1-2 years of focussed local action. (Kruger et al, 2019⁴).

⁴ E. Kruger, L. Sisitka, C. Stimie, J. McCosh, M. Dlamini, T. Mathebula, S. Mkhize and C. Van den Hoof. (2019). *Collaborative knowledge creation and mediation strategies for the dissemination of Water and Soil Conservation practices and Climate Smart Agriculture in smallholder farming systems. Deliverable No.7: Development of indicators, proxies and benchmarks and knowledge mediation processes.* Report for WRC K5/2719/4. Pretoria, May 2019