GLOBAL RESEARCH ALLIANCE
ON AGRICULTURAL GREENHOUSE GASES

CCARDESA
Centre for Coordination of Agricultural Research and Development for Southern Africa

GLOBAL RESEARCH ALLIANCE
ON AGRICULTURAL GREENHOUSE GASES

CCARDESA
Centre for Coordination of Agricultural Research and Development for Southern Africa

CONCEPT NOTE

SCOPING A FUTURE RESEARCH AGENDA FOR AGRICULTURAL GREENHOUSE GASES IN SOUTHERN AFRICA

September, 2021

Introduction and Background	Agriculture plays a vital role in food security, poverty reduction and sustainable development. The agriculture sector is particularly vulnerable to the impacts of climate change and faces significant challenges in meeting a dramatic increase in global food demand, while reducing its contribution to greenhouse gas (GHG) emissions. In Southern Africa, the agriculture sector accounts for over 17% of the region's gross domestic product (GDP) and provides a livelihood to about 61% of the region's labour force (RAP, 2014). The sector also accounts for 64% of total GHG emissions in the region (i.e. approximately 1,280 million tonnes of carbon dioxide equivalent (tCO2e) of GHG emissions in 2018). Rising temperatures and increasing frequency and intensity of extreme weather events such as droughts and floods, coupled with land degradation and poverty, pose an increasing threat to the population, and have severe consequences on ecosystem services and agricultural productivity (Midgley & Bond, 2015; Sikora et al. 2020). This calls for concerted actions of Southern African countries to address climate change challenges, increase agriculture productivity, improve food security, reduce emissions intensity, and improve the region's economy and environment. Improving agricultural productivity in southern African countries presents a great opportunity to achieve emissions reductions, while simultaneously addressing sustainable development goals relating to food security and economic development. Achieving these outcomes will demand, at least in part, increased awareness and understanding of the complexities of agricultural GHG emissions, appropriate farm-level mitigation measures and their economic and technical feasibility. This will demand for robust knowledge systems informed by research, reflective analytical processes, and a pool of skilled human resources. As more importance is placed on regional food security and the resilience of agricultural systems, adaptation to climate change and mitigation of agricultural GHG emissions are increasingly relevant to both regional and national priorities. However, mitigation of agricultural emissions is complex and depends on many factors including the available options for reducing emissions, farming and climate conditions, the policy setting, socio-economic factors and farmer adoption rates. There are still few effective mitigation options for agriculture and the evidence-base informing them is very weak. As such more research is required on the availability, applicability, and feasibility of various mitigation options relative to country specific situations and their agricultural systems. That research needs to be well-targeted and demand-driven, able to be implemented and supported by good agricultural development policy. There is, therefore, a need to engage stakeholders (NARS, Universities, NGOs, Private sector, Community Organizations, Farmers, Regional Networks, regional and international agricultural research centres, development partners and policymakers) and develop the field through initial research agenda setting. This is critical in generating dialogue and debate that can

	inform practice and further research that resonate within and beyond the needs of member countries. The Centre for Coordination of Agricultural Research and Development for Southern Africa (CCARDESA) was founded by SADC member states to harmonise the implementation of agricultural research and development (R&D) in the SADC region. CCARDESA achieves its objectives by facilitating cooperation among research scientists and institutions and supporting agricultural technology innovation, dissemination, and adoption in the region through collective efforts, training, and capacity building. CCARDESA outputs regularly feed into SADC support to improving public policy across southern Africa. In line with its mandate, CCARDESA promotes scientific research and policy designs, as well as cooperative arrangements among and between government agencies, research institutions and civil society, needed to ensure faster progress towards the solutions needed to collectively transform agricultural food production systems towards sustainability goals. The Global Research Alliance on Agricultural Greenhouse Gases (GRA) is primarily a network of governments who are interested in agricultural GHG emissions and their effect on climate change and food security. It aims to develop networks of researchers who work in this area, to collaborate and share information and technologies out to the farmers. The Alliance is focused on research, development and extension of technologies and practices that will help deliver ways to grow more food (and more climate-resilient food systems) without growing GHG emissions. The Alliance promotes an active exchange of data, people, and research to help improve the ways that agricultural GHG research is conducted and to enhance participating countries' scientific capability. The GRA and CCARDESA have therefore established a partnership to support agricultural research in agriculture greenhouse gases. Developing a common research and applications agenda on agricultural GHG emissions will complement CCARDESA's efforts to construct human capital, social awareness, and consensus, leading to action strategies and policy guidelines across the southern African region. Within its mission, CCARDESA is expected to set the agricultural agenda for the region. This has to be done in a consultative manner with the key stakeholders within the agricultural sector.
Proposed activity	CCARDESA in partnership with the GRA will convene a Science-Policy Dialogue to chart a common, mutually beneficial research focus on agricultural GHG emissions across southern Africa. The dialogue will provide a platform for researchers, policymakers, and practitioners to discuss major research and policy concerns related to agricultural GHG emissions and contribute towards the development of a common agricultural GHG emission research and application agenda. The agenda is intended to guide researchers and funders about key policy questions and associated research needs that, if met, will lead to more effective program design, and ultimately, improved agricultural productivity and reduced GHG emissions intensity of agricultural products. It will also set the region on the right path for achieving the SDGs and transform the production systems towards sustainability.

Objectives	The specific objectives of the Dialogue are: • To bring together national and international experts/officials interested in agricultural GHG emissions to improve research collaboration. • To identify common challenges/opportunities and knowledge/data gaps across agricultural GHG research and foster innovative, demand-driven and solution focused research. • To determine a common priority research agenda for key thematic areas in Southern Africa. • To chart a common pathway for promoting research capacities and implementation of the research agenda.
Intermediate Outcomes	The Dialogue intends to achieve the following outcomes: 1. Regional research priorities, which are to be applied in the immediate future identified. 2. Increased knowledge of opportunities and challenges of regional agricultural GHG research issues. 3. A research agenda providing an enduring research platform established. 4. Report/Policy brief on key agricultural GHG mitigation research priorities developed for agriculture practitioners, policymakers, academics, and donors.
Long-term Outcome	This dialogue, if held, will contribute to strengthening and reinvigorating agricultural GHG emissions research in Southern Africa and will help establish a firm foundation on which mitigation measures for GHG reduction will be developed, and add onto what has already been achieved in the region
Participants	Participants will be drawn from a diverse range of public and academic agricultural research institutions, private organizations, NGOs, and development partners from across the SADC region. The dialogue will be advertised through the CCARDESA and GRA networks and will be open to all interested participants. CCARDESA and GRA will ensure that institutions and practitioners directly involved in climate change mitigation and adaptation in agriculture are informed about the dialogue.
Timing:	4th November, 2021
Funding:	The dialogue will be organized by CCARDESA and GRA in collaboration with the GIZ with support from the New Zealand Agricultural Greenhouse Gas Research Centre, funded by the Ministry of Primary Industries, New Zealand.

References

Midgley GF, Bond WJ (2015) Future of African terrestrial biodiversity and ecosystems under anthropogenic climate change. Nature Climate Change 5:823

Sikora RA, Terry ER, Vlek PLG, Chitja J (eds) (2020) Transforming agriculture in southern Africa: constraints, technologies, policies and processes. Routledge, London ; New York

Climate Smart Agriculture: The 2nd Global Science Conference on Climate-Smart Agriculture. 2014, [http://climatesmart.ucdavis.edu/docs/CSANoteShort.pdf] (accessed 5 August 2014), (accessed 5 August 2014)