



MALAWI NEWSLETTER

December 2020

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BRECCIA December 2020 Overview

BRECCIA has successfully navigated 2020, with its final year 2021 now in focus. Our [Small Research Projects \(SRPs\)](#) are actively carrying out research, whilst starting to combine forces to 'upscale' their research via new Large Research Projects (LRPs) to address food and water security challenges on a larger scale with a multi-country/regional focus. BRECCIA faced down the challenge of working under travel and social distancing restrictions during the ongoing COVID-19 pandemic. Through [rapid adaptation](#) including increased virtual communication, [digitised events](#) and careful management of travel where legally permitted, our researchers have been able to advance their [research activities](#) regardless. Three of our lead researchers from Malawi based SRPs and LRPs have provided some reflection of their ongoing research in 2020 for our December issue:

LRP: Maize yield gaps in smallholder farming systems of sub-Saharan Africa – Dr Tendai Chibarabada

Maize is an important cereal in Malawi as it is the main staple food crop. Mostly grown by smallholder farmers, maize crop production has always been poor, affecting food security in the country. Current studies show that the drivers of poor productivity of most smallholder farmers remain poorly measured and understood, making it challenging to find solutions to improve food production and ultimately food security. We are doing a study in Malawi to understand crop yield gap using satellite data and local knowledge.

The aim is to model crop yield and yield gap at fine spatial scale and to further understand drivers of productivity gap under different socio-economic and biophysical environment contexts. The research team conducted experiments in the 2019/2020 rainy season in Phalombe district where they set up an experimental field of maize. They also measured Leaf Area Index in 150 farmers' fields using hemispherical cameras. The research team also monitored soil content using Teros 10 sensors that are connected to a ZL6 data logger. The maize was harvested during April 2020, with assistants from the local community who were the recipients of the harvested maize.

Analysis of the data collected is in progress, and very soon smallholder farmers in Phalombe district will have gained some knowledge as to how best they can improve crop productivity.



BRECCIA researchers installing Teros 10 soil moisture sensors at Namijiwa Vocational College in Malawi, where the experimental trial was being conducted



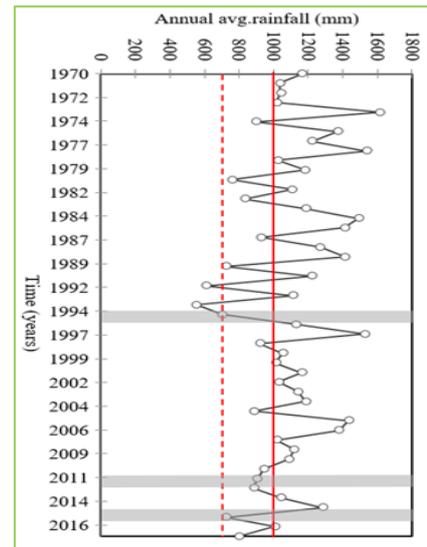
BRECCIA researcher capturing maize leaf size using hemispherical cameras

SRP: Evaluating Drivers of Aridity in the Lake Chilwa Basin – Oscar Kambombe

Lake Chilwa, the second largest lake in Malawi, has been drying up very often in recent years. This has mostly been attributed to climate change and climate variability. These hydrological phenomena are not entirely new; the lake dried up in 1995, 2012 and 2015 for example. The recent rate of recurrence however prompted further research. Some previous studies done in the Lake Chilwa Basin have generally attributed the recessions to the low rainfall received in the preceding year of an occurrence. A new study however shows that other factors and not just the low rainfall could be of significant influence to the recent dry-ups.

Preliminary results of a study done by Oscar Kambombe through the BRECCIA project show that while low rainfall is a contributing factor, the threshold appears to have slightly shifted upwards. For example in the 1995 recession, the preceding average annual rainfall for the basin was below 700mm which is a record low amount for the studied period. In the more recent episodes however of 2012 and 2015, the lake dried with average annual rainfall above 700mm but below 1000mm; amounts which were also observed before but never resulted in a complete drying of the lake, as for instance in 1980 and 1983.

This has led to a possible conclusion that more direct human influence rather than climate variability or climate change is the major influencing factor of the recent dry-ups. The study has compared the two periods of 1973 to 1995 and 1996 to 2018 and is still on-going.



Time series of annual rainfall in the Lake Chilwa Basin – Grey bars represent drying up years (1970-2017)



Lake Chilwa completely dried up in 2018

SRP: Analysis of the national seed policies seed of Malawi and Kenya: implications for resilience building in drylands under climate variability – Henry Hunga

In agriculture, seed carries one of the highest risk levels of all factors in limiting production, and this has been complicated by climate variability. Two seed systems, formal and informal, exist in Malawi and Kenya. The formal seed system is mainly comprised of the multi-national companies, whereas the informal seed system is traditionally managed by smallholder farmers with some support from Farmer Organisations and NGOs. The formal seed sector only supplies 20% of the seed planted by farmers overall, mostly maize, compared to 80% from the informal system.

Since 2010, African governments have moved towards regional integration of the seed industry through harmonised policies and regulation systems through COMESA and SADC. The recent policies that have been developed with regional integration in mind have not recognised the informal seed sector, giving it minimal attention and no regulations.

The research would like to understand the events that have led to this situation; who were the champions of the change and how could they be influential for future changes? What was the evidence used to make the shift? Is the current policy able to build resilience among smallholder farmers? Capacity to implement and the potential impact of the policies will also be assessed together with the coordination of the various stakeholders within the seed sector. Cross country comparisons between Malawi and Kenya will be done and lessons drawn from both countries for future policy design and implementation improvements. The research will be critical for future policy reviews within the agriculture sector and other sectors to ensure greater inclusion, policy impact and outcome.

Field work was disrupted by the Covid-19 pandemic. However, efforts are underway to re-start after amending the ethics application to include the preventative measures as instituted by the Government of Malawi.



BRECCIA researchers gathering information on harvested land pre-COVID lockdown



Seed testing laboratory in Lilongwe

All Malawi based SRPs and LRP (including multi-country projects)

Small Research Projects and Large Research Projects	Lead Researcher(s)
SRP: Evaluating Drivers of Aridity in the Lake Chilwa Basin	<i>Oscar Kambombe</i>
SRP: Analysis of gaps between policy-makers and community stakeholders in building climate change resilience in dry lands of Malawi: why do interventions fail?	<i>Frank Musa</i>
SRP: Cropland is increasing yet productivity is reducing in Malawi: The results of a long term satellite image analysis	<i>Dr Chengxiu Li</i>
SRP: Comparative analysis of mainstreaming use of climate information services use for food and water security in the drylands of Malawi, Ghana and Kenya: Supply versus demand	<i>Henry Hunga</i>
SRP: Monitoring agricultural land use change and its linkage to food security in Sub-Saharan Africa	<i>Dr Chengxiu Li</i>
SRP: The nexus between policies, food and water security in drylands of Malawi	Prof. Sosten Chiotha
SRP: Analysis of National Seed Policies of Malawi and Kenya: implications for water and food security resilience building in drylands	<i>Henry Hunga</i>
SRP: Dry spells vulnerability mapping for Malawi in relation to soil properties and linking to food security	<i>Ellasy Chimimba</i>
SRP: Calibration and evaluation of selected crop growth models for maize in multiple environments in sub-Saharan Africa	<i>Dr Tendai Chibarabada</i>
SRP: Land use and land cover changes and runoff assessment at Lake Chilwa sub-basin level: a SWAT + application in drylands of Malawi	<i>Catherine Kerapetse</i>
SRP: Multi-model approach to assess water resources availability and variability across Kenya, Ghana and Malawi	<i>Dr Daniela Anghileri</i>
SRP: Spatial climate change vulnerability assessment of livelihoods in the drylands of Ghana, Kenya and Malawi	<i>Dr Meryl Jagarnath</i>
SRP: Understanding the outcomes of developing and strengthening networks in an international food and water security research project	<i>Genevieve Agaba</i>
LRP: Hydrological Modelling and Forecasting for Water and Food Security: Upscaling data and methods for national to regional risk mapping and early warning	<i>Prof. Justin Sheffield, Dr Luke Olang</i>
LRP: Understanding, influencing and building capacity for policy in food and water security in Sub-Saharan Africa	<i>Dr Fiona Ngarachu, Prof. Chris Shisanya, Prof. Joy Obando</i>
LRP: Understanding spatial characteristics, socio-economic effects and opportunities of <i>Prosopis Juliflora</i> and other invasive plant species in drylands of sub-Saharan Africa	<i>Prof. John Obiri, Dr Francis Oloo</i>
LRP: Climate change, beliefs and social systems and food and water security in drylands of Sub Saharan Africa	<i>Prof. Samuel Codjoe, Yaw Atiglo</i>
LRP: Maize yield gaps in smallholder farming systems of sub-Saharan Africa	<i>Dr Tendai Chibarabada, Prof. Jadu Dash, Prof. Jean-Marie Kilyeshe</i>

In other BRECCIA News...

Malawi Policy Summer School

The 2020 Malawi Summer School held in November was dedicated to sharing BRECCIA research with policy makers. Read about the event [here](#).



BRECCIA receives funding for further collaborative Malawi research

BRECCIA received some great news in November, having been [awarded funding](#) as part of [UK Research and Innovation](#) and [Global Challenges Research Fund's Collective Programme](#).

This funding will see BRECCIA partnering with the projects [AFRICAP](#) and [FutureDams](#) to address: "Bridging national strategy on sustainable development of water-energy-food systems to local scale needs in Malawi"

The award is one of over 140 projects, across 18 calls, that form the UKRI GCRF Collective Programme, designed to enhance the overall impact across UKRI's six strategic GCRF Challenge portfolios in global health, education, sustainable cities, food systems, conflict and resilience.

BRECCIA at the first SADC-WaterNet virtual symposium

The BRECCIA team was able to secure a slot to host a special session at the first ever virtual SADC-WaterNet virtual symposium, read about the event [here](#).

BRECCIA researcher capacity building partners

[SARIMA](#) – Southern African Research & Innovation Management Association

[VITAE](#) – Realising the potential of researchers

...want to contribute to our next issue due in early 2021?

If you are part of BRECCIA's Malawi network and would like to notify our network of an upcoming event or interesting story about your activities in the next issue, please email s.reichel@soton.ac.uk or euniceshamella@gmail.com for details.

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