GHANA 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 Ghana based SRPs and LRPs have provided some reflection of their ongoing research in 2020 for our December issue:

SRP: Assessing Well-Being Outcomes of Women Shea Processors in Northern Ghana – Gertrude Owusu

Shea is unique because the production process in Ghana is primarily controlled by women from the collection stage to processing and marketing. For women in rural northern Ghana, the sale of shea, processed or unprocessed, is integral to the generation of cash income towards household food security. However, the time-consuming activities involved in shea processing are not commensurate with the generated low returns per unit of labour. Moreover, the shift from total control over shea incomes to joint spending decisions among married women with their spouses indicates a diminishing control over income. This could largely impact well-being as income is a significant predictor of how Ghanaians evaluate their own well-being in terms of happiness and life satisfaction. This study aims to comprehensively assess the work conditions in the shea processing and marketing business and how this affects the well-being of the women involved. A preliminary scoping visit to the study district of Talensi in the Upper East region of Ghana has helped to identify four communities where the research data will be collected from. These are Shiega, Kanibisi, Winkogo and Pwalugu. This will be followed by a reconnaissance visit and stakeholder engagement session to officially introduce the project to some key stakeholders. The focus group discussions, in depth interviews and key informant interviews will precede the stakeholder engagement.

There has not been any direct impact of COVID 19 on this SRP. Precautionary protocols will however be adhered to during the implementation of the planned activities moving forward.

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A household with women Shea processors in northern Ghana

SRP: An assessment of flooding from dam releases and its impacts on diarrhoeal disease and microbiological contamination of water sources in selected dryland areas in Northern Ghana – Dr Mawuli Dzodzomenyo

Communities along the White Volta in the Northern part of Ghana experience perennial flooding as a result of the spillage of excess water from the Bagre Dam in neighbouring Burkina Faso. This study aims to quantify and assess the water sources affected by such flooding, the impact on microbial contamination of domestic water and assess how flood events affect water-related infections. Initial remote sensing imagery/products has been used to assess the spatio-temporal distribution of such flooding. Since there is usually official notification of dam release events, 60 sample of water sources in flood-prone areas will be surveyed during dam release (flooding). Laboratory testing will be done on water samples collected for key parameters such as E. coli, Shigella, Salmonella, Faecal Enterococci, Nitrate, Electrical conductivity and Turbidity. This exercise will be repeated after flood waters have receded. Water quality data will be compared pre and post inundation to assess flooding's impact on water safety. Finally, reported water-related infections will be assessed relative to flood history, drawing on the DHIMS2 database of the Ghana Health Service for facilities in flood-prone areas. The key outputs of the project will be flood water parameters and its association with water contamination, and health outcomes and adaptation measures to flooding in the community populations.

COVID-19 movement restrictions impeded meeting schedules with stakeholders of this study. Due to this challenge some stakeholders were remotely and virtually reached.

Stakeholders include; National Disaster Management Organisation (NADMO), Ghana Health Service, Local Government and Rural Development, World Vision International, Local Water Providers and Traditional Authorities.

Example flood map layer for part of the Nabogo Basin in Northern region, Ghana. The image shows the area flooded (in blue) as a result of the Bagre Dam overspill in August – October 2018 as detected by satellite imagery

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SRP: Water harvesting technologies as resilience strategy for sustainable water and food security in dryland areas of Ghana – Moses Asamoah

Over-reliance on rain-fed agriculture is being threatened by climate change and variability as well as other environmental stressors. Food and water security future is susceptible in dryland areas due to single maximum, short, limited and unpredicted rainfall patterns which affects water availability and utilisation for both domestic use and agriculture. Water harvesting and management systems are vital resilience strategies for sustainable water and food security in dry land regions of Ghana, and they play an essential role in bringing about an urgently needed increase in agricultural productivity. The study is to assess the utility of the already existing water harvesting technologies for domestic and agricultural use via small-scale systems. A survey will be conducted on the water harvesting facility inventory compiled by the Ministry of Food and Agriculture in the selected dryland areas during wet season and repeated in the dry season. The survey will identify the type of facility, whether it is functioning, (and if so, for what purposes) and map their locations. For domestic facilities, the roof catchment area, impoundment and tank capacity will be recorded, and users asked to estimate typical daily volumes used, as well as alternative available water sources. Sentinel-2 will be used to classify impoundments. Using daily gridded rainfall (e.g. CHIRPS) and evapotranspiration products alongside harvesting facility characteristics and water use, a statistical model will predict whether a water harvesting facility is being used in a given time period, based on antecedent rainfall conditions and facility and user characteristics. The availability of harvested water to crop water requirements through the season will also be compared. Recommendations for optimising use of harvested water from these findings will be drawn from the results. Study results will be used to inform policy on technology desirability and adoption, resilience options and scaling up of good practices among small holder farmers as intervention strategies to meet community resilience for year-round availability of water and cultivation. COVID-19 restrictions disrupted meeting schedules with stakeholders. Due to this challenge, some stakeholders were remotely and virtually reached.

Stakeholders include; Ministry of Food and Agriculture (Agricultural extension officers), farmer groups, water harvesting facility managers and owners, and water resource management.

Water harvesting facility for cultivation and livestock, domestic water harvesting components and stakeholders (farmers)

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All Ghana based SRPs and LRPs (including multi-country projects)

Small Research Projects and Large Research Projects	Lead Researcher
SRP: Food beliefs: Toward a participatory mapping of food security in drylands of Northern Ghana	*Dr Yaw Atiglo*
SRP: Water harvesting technologies as resilience strategy for sustainable water and food security in dry land areas of Ghana.	*Dr Mawuli Dodzomenyo*
SRP: Assessing wellbeing outcomes of women Shea processors in Northern Ghana	*Gertrude Owusu*
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	*Henry Hunga*
SRP: An assessment of flooding from dam releases and its impacts on diarrhoea disease and microbiological contamination of water sources and vegetables in selected dryland areas in Northern Ghana	*Dr Mawuli Dzodzomenyo*
Understanding the outcomes of developing and strengthening networks in an international food and water security research project	*Genevieve Agaba*
SRP: Capacity building and variability in the drylands of Ghana and Kenya	*Dr Matt Kandel*
SRP: Calibration and evaluation of selected crop growth models for maize in multiple environments in sub-Saharan Africa	*Dr Tendai Chibarabada*
SRP: Spatial climate change vulnerability assessment of livelihoods in the drylands of Ghana, Kenya and Malawi	*Dr Meryl Jagarnath*
SRP: Multi-model approach to assess water resources availability and variability across Kenya, Ghana and Malawi	*Dr Daniela Anghileri*
SRP: Monitoring agricultural land use change and its linkage to food security in Sub-Saharan Africa	*Dr Chengxiu Li*
SRP: Spatial climate change vulnerability assessment of livelihoods in the drylands of Ghana, Kenya and Malawi	*Dr Meryl Jagarnath*
LRP: Hydrological Modelling and Forecasting for Water and Food Security: Upscaling data and methods for national to regional risk mapping and early warning	*Prof. Justin Sheffield, Dr Luke Olang*
LRP: Understanding, influencing and building capacity for policy in food and water security in Sub-Saharan Africa	*Dr Fiona Ngarachu, Prof. Chris Shisanya, Prof. Joy Obando*
LRP: Understanding spatial characteristics, socio-economic effects and opportunities of *Prosopis Juliflora* and other invasive plant species in drylands of sub-Saharan Africa	*Prof. John Obiri, Dr Francis Oloo*
LRP: Climate change, beliefs and social systems and food and water security in drylands of Sub Saharan Africa	*Prof. Samuel Codjoe, Yaw Atiglo*
LRP: Maize yield gaps in smallholder farming systems of sub-Saharan Africa	*Dr Tendai Chibarabada, Prof. Jadu Dash, Prof. Jean-Marie Kilyeshe*

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In other BRECcIA News…

Ghana Policy Summer School

The 2020 Ghana Summer School held on November 18th at the Accra City Hotel 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 gertdomfeh@gmail.com for details.

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UK Research and Innovation