

NEWSLETTER



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Pictured after the signing of the SASSCAL Treaty and Joint Declaration: Second from Left, Honourable Minister, Maria do Rosario Braganca Sambo – Angola Minister of Higher Education, Science, Technology and Innovation , Her Excellency Tshenolo Modise – High Commissioner of the Republic of Botswana in Namibia, Honourable Alpheus. G. !Naruseb – Namibia Minister of Agriculture, Water and Forestry, Her Excellency Stella Libongani–High Commissioner of the Republic of Zambia in Namibia, Professor Rene Haak – Representative of the German Minister of the Federal Ministry of Education and Research and, Extreme left SASSCAL Deputy Board Chair Hon. Anna Shiweda and SASSCAL Board Chair Mrs Jane Chinkusu extreme right congratulate Member States Ministers and Minister representatives

SIGNING OF THE SASSCAL TREATY AND JOINT DECLARATION



ED'S OPENING ARTICLE



Dr Jane Olwoch

SASSCAL Executive Director

Can Green Hydrogen be the Future Fuel?

Energy is vital to development in Southern Africa. Beyond its use in daily life, energy catalyses infrastructure projects that drive both regional integration and economic growth. As the Southern African Development Community (SADC) region industrialises on its path to sustained development, energy production and distribution will only increase in importance.

The regional energy generation mix is still largely dominated by non-renewable energy, particularly coal. Coal supplies 75% of power generation in Southern Africa (SADC Energy Monitor 2018) and continues to be the primary choice that many countries generally rely on. However, these energy sources generate harmful greenhouse gases that accelerate climate change and its devastating impacts. As we go into the future, we experience more and more hotter years. 2018 was the fourth warmest since 1880 and ranks behind 2016, 2017 and 2015. The past five years are, collectively, the warmest years in the modern record (NASA and the National Oceanic and Atmospheric Administration (NOAA) 2019). The relentless accumulation of greenhouse gases in the atmosphere, plus natural climate variability, helped to push 2019 toward record warmth (NASA 2019).

Despite the dependency on fossil fuels by several SADC countries, the region has over the years experienced lowest rates of access to electricity (SADC and SARD, 2018), along with other regions in Africa. Intermittent

power shortages have been experienced across the region for the past decade. In South Africa, the first period of chronic power shortages started in late 2007 (Myburgh 2008). South Africa experienced its worst energy crisis when load shedding stage 6 was activated for the first time in December 2019. The Lusaka Times (30/10/2019) reported a 15-hour load shedding in Zambia and all SASSCAL countries and other countries within the SADC region are experiencing various levels of load shedding.

The SADC region is also generously endowed with renewable energy resources such as solar, wind, and hydro. As concerns about sustainable energy and the impact of fossil fuels rise, renewable energy has become an important topic, both within the SADC region and around the world.

A few decades ago, hydrogen was identified as a critical and indispensable element of a decarbonised, sustainable energy system to provide secure, cost-effective, and non-polluting energy. Since then, there has been a continued and strengthened global resolve to adopt renewable energy to mitigate climate change.

Transitioning from fossil fuels to renewable energy represents a co-benefit in terms of reduction of greenhouse gases and reducing pollution from fossil fuels that continues to cause harm to many in the developing world. Different types of renewable energy exist including hydrogen.

Currently, almost all of the available hydrogen is produced from hydrocarbons such as natural gas and coal. As a consequence, the hydrogen production is responsible for the emission of around 830 million tons of carbon dioxide per year (AleaSoft energy forecasting, REVE 2019). However, there is a non polluting alternative, **green hydrogen**. **Green hydrogen** is believed to be a non-polluting alternative because it is obtained through the electrolysis of water with no resultant greenhouse emissions. In this case, hydrogen is a clean fuel that may well have an important role in future low-carbon energy systems. With the decrease in the costs of renewable electricity, in particular solar photovoltaic and wind energy, the interest in **green hydrogen** is growing.

*“**Green Hydrogen Energy (GHE) has the potential to slow climate change and create a sustainable future**”*

As such, **Green Hydrogen Energy (GHE)** has the potential to slow climate change and create a sustainable future. Hydrogen could play a significant role in a low-carbon future enabling a more secure energy system with reduced fossil fuel dependence (International Energy Agency 2019). GHE has the versatility to operate across various sectors including transport, industry and electricity generation. Adoption of GHE is however not without drawbacks. The current major drawbacks to hydrogen are cost and availability and inadequate scientific knowledge and expertise in the developing world to embrace the new technology.

In response to the above, the German Ministry of Education and Research is investing a substantial amount of money to spearhead knowledge generation and capacity building towards the commercial production of **green hydrogen** in Africa. This massive Initiative is funded by the Renewable Energy and **Green Hydrogen** Technology Department

of the BMBF. The project aims to support sustainable and economic development in Africa through a viable hydrogen economy. It has a high potential to make Africa an exporter of **green hydrogen** hence gaining more relevance in the international energy market and reducing dependence on fossil fuel. It will be coordinated by the Southern African Science Service Centre for Climate Change and Adaptive Land Management (SASSCAL) in SADC. The West African part of the project will be coordinated by the West African Science Service Centre for Climate Change and Adaptive Land Management (WASCAL).

This project is aligned to SASSCAL future direction and in particular the SASSCAL 2.0 Strategy in which the Research Call, SASSCAL emphasizes the importance of transdisciplinary and regionality of SASSCAL's projects. Under the SADC Grand Challenges, SASSCAL has emphasized the need to give a special focus on projects that cut across different sectors such as Water, food, and energy. The **Green Hydrogen** Project is a practical example that complements this important research.

The **Green Hydrogen** Project is also an excellent contribution to the global reduction of greenhouse gas emissions. Deforestation rates in several SASSCAL's Member States are increasing at an alarming rate. Many of the rural communities use wood as the main source of fossil fuel because there is no alternate source of energy or even if there is, they cannot afford. The **Green Hydrogen** Project has identified this gap and provides a future energy source that not only bridges this gap, but also improves capacity and creates jobs. SASSCAL is fortunate to contribute to this new, emission free and innovative energy future.

*“**The Green Hydrogen Project is also an excellent contribution to the global reduction of greenhouse gas emissions**”*

SASSCAL TREATY AND JOINT DECLARATION SIGNED CONSOLIDATING INTERNATIONAL PARTNERSHIP FOR CLIMATE ACTION



Front Row from left: Her Excellency Tshenolo Modise - High Commissioner of the Republic of Botswana in Namibia representing Hon. Kitso Mokaila Minister of Environment, Natural Resources Conservation and Tourism, Honourable Minister, Maria do Rosario Braganca Sambo – Angola Minister of Higher Education, Science, Technology and Innovation, Honourable Alpheus. G !Naruseb – Namibia Minister of Agriculture, Water and Forestry, Professor Rene Haak – Representative of the German Minister of the Federal Ministry of Education and Research and Her Excellency Stella Libongani - High Commissioner of the Republic of Zambia in Namibia representing Hon. Dr. Brian Mushimba Zambia Minister of Higher Education

“

The signing of the SASSCAL Treaty and Joint Declaration on 26 September 2019 marked another major milestone in the history of the Regional Initiative. The Ministers signed the SASSCAL Treaty while the Joint Declaration was signed by the Ministers and Representatives of Member States and the funding Partner, in Windhoek, Namibia, during the second Ministerial meeting”

The signing of these two documents is fundamental to SASSCAL as it paved the way for the transition of the Regional Initiative into an international organisation. As an international organisation, SASSCAL will have an ideal platform to ensure a more global footprint through access to international funding instruments. This provides a broader platform for SASSCAL researchers for international interaction through knowledge and technology transfer.

By signing the Treaty and the Joint Declaration, Member States committed their continued political and financial support to the Southern African Climate Service Centre. Regional Initiatives such as SASSCAL, require both financial and political backing of Member States for the realisation of their Missions and Visions as they are an ideal conduit for international partnership

and science diplomacy. Challenges of climate change are far-reaching and have no regard for geographic boundaries. The Treaty and the Joint Declaration have further strengthened the cooperation of the Member States and Germany towards addressing these challenges.

With the successful completion of the first research portfolio (SASSCAL 1.0), SASSCAL received resounding recognition in various international platforms, including the scientific and political communities. SASSCAL continues to move from strength to strength as an organisation with its second Research Portfolio (SASSCAL 2.0) already launched. The signing therefore further cements SASSCAL's ideal positioning for facilitating research, providing knowledge products and services and contributing to capacity development on climate change and adaptive land management.

INAUGURATION OF THE SASSCAL COUNCIL OF MINISTERS



Pictured during the Inaugural SASSCAL Council of Ministers closed meeting: From left - Mrs Jane Chinkusu – SASSCAL Board Chair, Her Excellency Stella Libongani – High Commissioner of the Republic of Zambia in Namibia, Prof Gabriel Miguel – Board member (Angola), Honourable Minister, Maria do Rosario Braganca Sambo – Angola Minister of Higher Education, Science, Technology and Innovation, Honourable Anna Shiweda – SASSCAL Deputy Board chair and Deputy Minister of Agriculture, Water and Forestry Namibia, Honourable Alpheus. G !Naruseb – Namibia Minister of Agriculture, Water and Forestry, Her Excellency Tshenolo Modise - High Commissioner of the Republic of Botswana in Namibia , Mr Balisi Gopolang - alternate Board member (Botswana), Professor Rene Haak – Board Member (German) and representative of the German Minister of the Federal Ministry of Education and Research and Dr Jane M Olwoch – SASSCAL Executive Director.

Another milestone was realised in SASSCAL's history on 26 of September 2019: Following the Press Conference on the Signing Ceremony of the SASSCAL Treaty and Joint Declaration, Member States Ministers and representatives held the Inaugural meeting of the Council of Ministers. Honourable Minister Honourable Alpheus !Naruseb (Namibia); Honourable Minister; Maria do Rosario Bragança Sambo (Angola); Her Excellency Tshenolo Modise (representing Honourable Minister Mokaila, Botswana); Her Excellency Stella Libongani (representing Honourable Minister Brian Mushimba, Zambia) and Prof. Rene Haak (representing Honourable Minister Anja Karliczek, Germany) attended the meeting.. The SASSCAL Governing Board was represented by Mrs. Jane Chinkusu- Board Chair,

Honourable Anna Shiweda - Vice Chair, Prof Gabriel Miguel - Board member (Angola), Mr Balisi Gopolang - alternate Board member (Botswana) as well as Ex-officio member, Dr Jane M Olwoch, SASSCAL Executive Director.

The Council of Ministers is SASSCAL's highest strategic organ responsible amongst others, for ensuring conformity with climate change policies prevailing in the Member States. Honourable Alpheus !Naruseb, the host Minister of the Regional Secretariat, was elected as the chairperson of the Council of Ministers, serving a term of two years. The Council of Ministers will meet every two years, however, extra meetings may be held when necessary.

SASSCAL AT THE CONFERENCE OF PARTIES (COP-25)

The Conference of the Parties (COP), is the supreme decision-making body of the United Nations Framework Convention on Climate Change (UNFCCC). All States that are Party to the Convention are represented at the COP. Its 195 member countries meet annually for 2 weeks to discuss the challenges of climate change and review the implementation of previously agreed measures. Parties also assess the implementation of the Convention and any other legal instruments that the COP adopts. The COP further takes necessary decisions to promote the effective implementation of the Convention, including institutional and administrative arrangements.

The UN Climate Change Conference (COP25) was held from 2 to 13 December in Madrid, Spain, under the presidency of Chile. COP 25 was the 25th edition of the summit and was held under the theme: Time to act, a call to all countries to scale up their commitments to fighting climate change. The first COP meeting was held in Berlin, Germany in March, 1995. The COP25 had as objective to raise ambition to go beyond the targets in the Paris

Agreement, which set out to keep global warming to below 2 °C, and to assert the need to move toward climate and energy scenarios that ensure that this increase stays below 1.5 °C.

COP maintains an inclusive and transparent process, where all countries need to be involved in order to ratify and ensure the final outcome. Therefore, participants of the COP 25 came from around the world and included



Session Panellists at CoP 25: Dr Karsten Hess (BMBF), Dr Savadogo Moumini (WASCAL), Dr Christoph Gornott (PIK) Dr Kira Vinke (PIK), Dr Jane Olwoch (SASSCAL), Dr Joerggrg Helmschrot (SASSCAL) and Lisa Murken (PIK)

civil society, governments, international organisations, businesses, bankers, scientists, academia and many others. Most of the negotiations during COP 25 were aimed at supporting countries to implement the Paris Agreement. COP 25 has been seen as a stepping stone on the road to the official 2020 start date for the Paris Agreement. In this regard, one major deadline is the finalisation of the market mechanism and other such “cooperative approaches” for the Paris Agreement. This step is vital to help countries implement the Paris Agreement when it begins in 2020.

The COP also serves as a platform for increasing momentum for greater climate action. There is widespread understanding that we need to do more to reduce emissions and build resilience, but countries have yet to formalize this understanding into new Nationally Determined Contributions (NDCs). It has been agreed by the parties that 2020 is the deadline for countries to submit new, more ambitious NDCs.

It is against this background that SASSCAL convened and participated in a side event during COP 25 on 13 December in the EU Pavilion. SASSCAL held the joint side event titled ‘Challenges and solutions for agricultural adaptation planning in Sub-Saharan’ Africa with Potsdam Institute for Climate Impact Research (PIK) and West African Science Service Centre for Climate Change and Adapted Land Use (WASCAL), SASSCAL’s sister organisation in west Africa.

The panel thoroughly interrogated the role of international partnerships for regional capacities for climate adaptation. The establishment and successes of WASCAL and SASSCAL were cited by Dr Karsten Hess, as practical and successful platforms for mutually beneficial international partnerships. These Regional Initiatives have enhanced the visibility of science in Africa, through the successful completion of their first research portfolios. Both Regional Initiatives are at the second phase of their research portfolios that aim to meet the immediate research needs of their regions.

SASSCAL Executive Director Dr Jane M Olwoch spoke directly to the COP 25 theme, by highlighting that ‘the

climate crisis that we are experiencing and the slow pace in responding is a fundamental realization of how long we have taken nature’s ecosystem services and functions for granted’. Dr Olwoch further noted that, generally, resources are quickly and efficiently assembled to abate political unrest, yet, climate crisis is a war like no other, it has far more reaching consequences because it questions our own survival as a human race. It is war that we can and must win, she added.

Dr Olwoch highlighted the importance of international partnerships, in addressing the challenges of climate change. The United Nations Framework Convention on Climate Change (UNFCCC) has recognized this fact in its several principles and mechanisms such as the Common but Differentiated Responsibility principle in responding to climate change. No-one nation can do it alone, but strong and sustained partnerships between people, institutions and nations are required both for mitigation and adaptation, she added. Dr Olwoch concluded her remarks by reminding the delegates that despite these challenges, ‘it is not a time to despair but time to reorganise ourselves because the answers lie within us. I am very encouraged by what I saw and heard at COP 25 and in particular from the EU Green Deal. We look forward to knowing more about what it means and how partnerships between Europe and Africa can further be strengthened from this deal and others, in responding effectively to the global climate crisis” she concluded.

The session concurred that education and research are decisive for addressing global challenges. There is an urgent need for innovative capacity development to overcome global challenges. Co-production and co-ownership were also identified as pivotal to addressing these global challenges and consequently the need to focus on designing adaptation strategies that are specific to local needs. Co-production was also identified as a catalyst for the science - community interface.

THE INNOVATION BRIDGE TECHNOLOGY SHOWCASING AND MATCHMAKING EVENT AND SCIENCE FORUM SOUTH AFRICA (IBSFSA)

SASSCAL hosted a successful and interactive exhibition stand at the 2019 joint event under the theme “Igniting Conversations about Science for Innovation with Impact”, that was held at the CSIR International Convention Centre from 4 to 6 December 2019 in Pretoria, South Africa.

SASSCAL operates in a huge southern African expanse and accordingly, cannot engage and interact with its stakeholders as frequently and as interactively, as would be desired. Therefore, participating at such platforms such as the IBSFSA, provides SASSCAL with

a rare opportunity of face to face interaction with its stakeholders and partners.

The Forum attracted participants from all corners of the globe and the SASSCAL exhibition booth registered more than 1200 visitors. Stakeholders from various sectors such as scientists, government officials, industrial leaders, students and representatives from the broader civil society visited the booth. SASSCAL staff actively engaged with stakeholders at the stand and also created new networks with other exhibitors.



SASSCAL staff, including the Executive Director, interacting with delegates at the SASSCAL exhibition Stand

The exhibition booth was an ideal platform that showcased our achievements and created visibility for our services and products. Visitors to the booth engaged in interactive discussions about SASSCAL's Research portfolio. Amongst others, the WeatherNet platform was presented to interested visitors at the booth. Data from the WeatherNet is available openly and freely accessible at www.sasscalweather.net

In addition to hosting a booth, the SASSCAL Executive Director chaired the SASSCAL side event titled 'International Partnerships for Climate Change Action'

on 6 December 2019 at the IBSFSA. The panel explored SASSCAL's Research activities and the importance of building regional and international partnerships, to ensure effective adaptation and mitigation measures in response to Climate Change. The panel speakers were Dr Lisette Andreae, Head of Education, Science, Research and Technology at the German Embassy in Pretoria, Dr Jörg Helmschrot, SASSCAL's Director of Science and Technology & Capacity Development and Ms Hedwig Black, SASSCAL's Namibia Node Programme officer.



Pictured during the panel discussion from left: Dr Jörg Helmschrot, SASSCAL's Director of Science and Technology & Capacity Development, Dr Lisette Andreae, Head of Education, Science, Research and Technology at the German Embassy in Pretoria, Dr Jane M. Olwoch, SASSCAL's Executive Director, Ms Hedwig Black, SASSCAL's Namibia Node Programme officer.

During the discussion, the speakers highlighted how the partnership between SADC Member States and Germany, facilitated through SASSCAL, has produced excellent products in research, capacity development and service provision for the region. In addition, the role of politicians and climate activists on the goal of climate change mitigation was emphasised.

The session also went on to explore and discuss the critical role that gender consideration plays in responding to climate change. Women are inherently vulnerable to the adverse effects of climate change

but have a lower adaptive capacity due to higher poverty rates in this demographic and limited access to resources in comparison to their male counterparts. Thus, gender consideration ensures those with the greatest need for adaptation are not left out.

The panel concurred that international partnerships for climate action are required to address global challenges. There is an urgent need for joint efforts that prioritise a collective response to climate change challenges.

*Business as usual isn't an
option – we only have
one planet.*

CLIMATE CHANGE AND VARIABILITY: HOW IT IS AFFECTING RURAL COMMUNITIES IN NAMIBIA

Global communities face unprecedented times with anticipated changes in the global climate. Namibia is predicted to have an increase in extreme weather events such as floods and droughts, and rainfall is anticipated to become more erratic and shifts in crop planting seasons are expected. Computable general equilibrium (CGE) model simulations for Namibia indicate that annual losses to the country's economy could be up to 5% of GDP over 20 years, due to climatic impacts on natural resources. Heavy reliance on natural resources for economic activities increases vulnerability of communities to variable and sometimes extreme climates, adverse environmental change, and a relative paucity of and decline in natural resources. Historically, people living in rural communities of Namibia have adopted several coping mechanisms to deal with these conditions. Today, however, many communities exhibit low levels of adaptive capacity due to challenges such as marginalisation, under development, poverty, inequality, weak governance, maladaptive policies, increasing population growth, inadequate access to health care and education and gender based violence. Climate change is expected to augment existing levels of vulnerability, as mean temperatures rise, rainfall decreases, and seasonal climate patterns become more variable.

Sectors such as agriculture provide much needed income and livelihoods for the rural poor. It is estimated that approximately two thirds of Namibia population practice subsistence farming. However the agriculture sector have significant challenges, such as the susceptibility of crops to drought and livestock sensitivity to heat stress and disease. Rural communities in the north of the country are at increased risk of loss in crop yields. These risks are already noticeable with observed decreased in yields for crops such as maize and pearl millet (mahangu) over recent years. Additionally, farmers are experiencing significant loss in livestock due to persistent drought conditions over the past few years. Furthermore, smallholder farmers in the south and central Namibia are faced with the reality of decreased small livestock production, and in some instances complete loss of their stock, due to predicted decrease in the carrying capacity of rangeland and thus subsequent range shifts of small stock. These losses in agricultural productivity directly translates to loss of income, jobs and decreased food security for many rural communities.



Very Skinny, Emaciated Cow Walking on Dry Land by a Village in Kaokoveldt, Namibia, Image credit: Dietmar Rauscher/ Shutterstock.com

According to the Agricultural Inputs and Household Food Security Situation report, over 90 000 draught related livestock deaths were recorded for the period of Oct 2018 and Sept 2019. The eastern and southern parts of the country recorded the highest deaths, due to very limited grazing and browsing vegetation and water for livestock. Rural farmers in the //Karas, Erongo and Omaheke regions of the country faced severe waters scarcity during the 2018/2019 because of low borehole yields and in some instances complete drying up of boreholes. Severe draught conditions limit rural farmers ability to sell their livestock due to their inability to access formal markets, poor conditions of livestock and thus subsequent low livestock prices. Moreover, prolonged drought conditions add additional strain to rural farmers as they are less able to keep their stock alive through supplemental feed and water provision due to their limited access to resources.

Steady efforts are being made in the country to ensure that rural communities are becoming more resilient to current and predicted changes. Various programmes such as the "Country Climate Smart Agriculture Programme", a joint programme by the Ministry of Environment and Tourism (MET) and Ministry of Agriculture, Water and Forestry (MAWF), ensures that rural communities have access to climate smart technologies and practices. Climate science services and products, provided by institutions such as Southern Africa Science Service Centre for Climate Change and Adaptive Land Management (SASSCAL), are becoming

increasingly important to improve understanding of weather patterns and predictions.

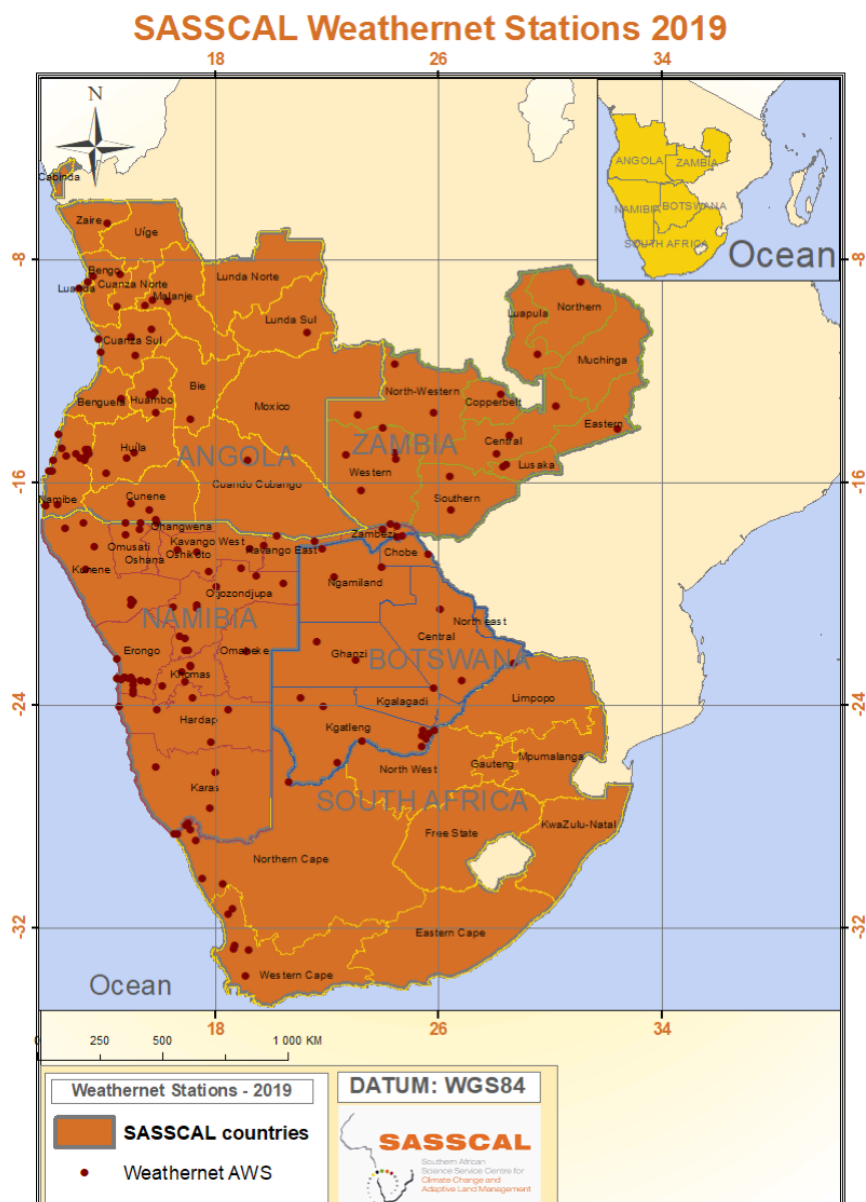
SASSCAL Automatic Weather Station now totalling 160 was established to augment the regional weather monitoring network. The Automatic Weather Stations (AWS) record weather conditions according to WMO standards including rainfall, air and soil temperature, humidity, wind speed and direction, barometric pressure, solar radiation, leaf wetness and other sensor data. The recorded data is published on a website accessible at <http://sasscalweather.net.org/> for easy and open access.

A large proportion of our customers are universities and research institutes (E.g. University of Botswana, Namibia University of Science and Technology, University of Namibia, University of Cape Town, Universität Münster,

University College Dublin (UCD), Gobabeb Research & Training Centre, University of Hamburg, UCLA Center for Sleep Research, Groundwater Resources Management Support Programme (GReSP), University of the Witwatersrand, South Africa) that use the data to support research.

Additionally, the general public uses the data for information purposes by visiting the website (average of 90 visits per day from direct access, search and referral) or subscribing to the daily weather mails which currently has a distribution list of 47 members.

This allows for improved decision making and development of appropriate adaptation measures in order to increase rural community's resilience and reduce vulnerabilities.



SASSCAL PLANNING MEETING TO DRIVE EXTRAORDINARY RESULTS

SASSCAL held its internal Planning Meeting from 20 to 21 November 2019. The meeting provided a platform for the team to evaluate its progress to date in achieving the SASSCAL Mission and Vision, as well as its operational planning for 2020.

There are many schools of thought that argue that an Annual Planning Meeting is the most important meeting of the year. All half- yearly, quarterly, weekly and daily

execution plans anchor off the decisions made during the yearly planning meeting. It is then those half- yearly, quarterly, weekly and daily plans that drive the focus of the organisational progress and performance.

The team identified our core strengths and best practices were shared for implementation. The meeting is another vehicle that moves SASSCAL's strategic goals forward and ensures alignment to the SASSCAL 2.0 Strategy, in



Planning meeting group picture

line with the regional agenda. The meeting produced a draft Annual Operational Plan for 2020 which will serve as a guiding framework for 2020 activities. All SASSCAL staff from the National Nodes and Regional Secretariat attended the meeting.

The active engagement and animated deliberations of the Planning Meeting ended with an end of year dinner, hosted by SASSCAL's ED, Dr Jane Owoch.



Staff members pictured at the end of year dinner

CAPACITY DEVELOPMENT FOR WEATHERNET STAFF'S SKILLS

SASSCAL's WeatherNet team recently participated in a capacity building collaboration during a training session from 16 to 24 October 2019 in Windhoek, Namibia. The hands-on practical training was facilitated by Katrin Josenhans and Thomas Hillmann from the University of Hamburg, Germany. This training was a follow-up training towards the permanent transfer of all responsibilities related to the operation of the WeatherNet online platform system and related services to SASSCAL, as well as their incorporation in the SASSCAL Open Access Data Centre (OADC) operations at the SASSCAL Regional Secretariat (RS).

The visiting team actively liaised with the SASSCAL WeatherNet team to review and recap the essential day to day activities to ensure the continued optimal

operation of the system and the quality assurance of the data. The system's infrastructure that had been put in place at the SASSCAL RS, was also reviewed. All the aspects of the server were tested for conformity with the defined requirements and the test instance was fully tested.

To conclude the visit, the teams deliberated on various aspects pertaining to the system and its smooth operation. A status audit of all the WeatherNet automatic stations was conducted and revealed that a total 160 automatic weather stations exist in the WeatherNet ecosystem. Of these, 142 are actively recording measurements which are being published on the website <http://sasscalweathernet.org/>, while 8 are temporarily offline, and 10 are inactive.



From left Katrin Josenhans, Tuwilika Nangobe, Baptista Joao and Thomas Hillmann

SASSCAL EXPANDS ITS AUTOMATIC WEATHER STATION NETWORK FOR ENHANCED COVERAGE



Installation of new Automatic Weather Station in Omafo in the Ohangwena region, Namibia

The SASSCAL WeatherNet makes weather data available from a network of 154 Automatic Weather stations (AWS) within the southern African region. These are strategically distributed throughout the region to achieve optimal regional coverage and the data recorded and transmitted by these stations are subjected to stringent full-time quality assurance procedures. The stations record near real time data for a number of weather parameters, including: air and surface temperature; precipitation; wind parameters and humidity. Weather monitoring networks are of crucial importance for a wide range of social, economic, environmental and agricultural activities, such as subsistence farming.

Subsistence farming in southern Africa contributes substantially to the region's food security and most crops in southern Africa are rain-fed. Knowledge about the region's seasonal rainfall forecast can inform sowing periods and the likelihood of successful crops, which consequently impact food security. The region is heavily reliant on agriculture. Agriculture has always been heavily dependent on the weather and weather forecasts, both for its control on the quality and quantity of harvests. Availability and ease of access to near real-time weather conditions is envisioned to be the best way to protect crops and secure a high and healthy yield.

SASSCAL acknowledges the importance of reliable and accessible climate records. All SASSCAL WeatherNet data are therefore made available openly and freely through the SASSCAL WeatherNet page (www.sasscalweathernet.org).

AWS are the backbone of weather monitoring which is important not just in defining present climate, but also for detecting changes in climate. The SASSCAL WeatherNet system comprises a network of Automatic Weather Stations (AWS) transmitting data near real-time via a combination of GSM, satellite and internet technology to an openly accessible web application (the WeatherNet) where data is stored, processed and visualised.

The SASSCAL WeatherNet is maintained and operated in close collaboration with the designated National authorities of the SASSCAL countries. With the support of funding from the German Federal Ministry of Education and Research, SASSCAL continues to spatially expand its monitoring network of AWS, thereby improving network coverage of AWS, which in turn contribute to improved availability of data for research, planning and forecasting.

In this line, SASSCAL participated during the installation of three new AWS at Omafo in the Ohangwena region of Namibia. This hands-on experience of the installation and testing of weather stations provided important knowledge and insight of weather observation principles and AWS operations. With this comprehensive overview of the WeatherNet, the OADC team is ready and confident with the ongoing handover of the system from SASSCAL's partner institution – the University of Hamburg (UHH) in Germany.

SASSCAL CONTRIBUTION TO CLIMATE RESEARCH IN AFRICA



SASSCAL participated at the African Climate Risks Conference (ARC) organized by Future Climate for Africa and SouthSouthNorth. The conference was held in Ethiopia from 7 to 9 October 2019 under the theme 'Dismantling barriers to urgent climate adaptation action'.

The SASSCAL Executive Director, Dr Jane M Olwoch participated in a plenary session on the 'State of climate research for development in Africa - challenges and opportunities'. Dr Olwoch advocated for increased and mutually beneficial international partnerships,

engagements with stakeholders and multi-disciplinary research teams. The SASSCAL ED provided participants with an overview of SASSCAL 1.0 successes, in terms of understanding the region's state of climate change. The Executive Director further highlighted SASSCAL's contribution to providing evidence-based solutions to the impacts of climate change. SASSCAL research, under its first portfolio, has made meaningful contributions towards strengthening the region's capacity in climate change and has received notable international recognition.

The ARC (African Risks Climate Conference)

- disseminated results and shared insights from new and ongoing climate science and adaptation research in Africa;
- provided a forum to identify common priorities in the African climate research for development agenda through African-led collective discussions;
- contributed to efforts towards addressing barriers to effective use of climate information by promoting the uptake of new data, tools and knowledge within planning and decision-making processes; and
- linked researchers to a diverse network of other actors necessary for moving research into policy and practice: decision-makers, national meteorological agencies, knowledge brokers, donors, and NGOs.



Dr Jane M Olwoch pictured during the panel discussion

As part of the ARC, the SASSCAL Executive Director Dr Jane M Olwoch participated on the 9th of September in the SINCERE (Strengthening International Cooperation on Climate Change Research) Flagship Action for Africa: Research concepts, a joint African-European call on innovative climate services for the African regions side

event organised by JPI Climate/SINCERE/AAS. SINCERE is a consortium of 22 international partners, under the lead of JPI Climate. JPI Climate is a partnership of major climate research funders from 18 European countries and aims to strengthen international cooperation in climate change research and innovation.



Plenary: State of Climate Research for Development in Africa

The SINCERE side event explored user-centred interests and priority areas to inform the design of a joint European-African call for funding on innovative climate services for Africa.

Dr Olwoch participated in another SINCERE side event which focused on opportunities and research needs for the development of applied climate services, supporting cross-sectoral innovative approaches, including sustainable agriculture, renewable energy, water management, nature conservation, as well as for anticipating the risks associated with climate change.

Dr Olwoch shared the SASSCAL Vision on innovative regional climate services in Sub-Saharan Africa. She also highlighted some of the main research gaps that were identified under the concluded SASSCAL 1.0 Research Portfolio as well as provided insight on how interdisciplinarity, co-design, co-production and co-evaluation of Climate Services with stakeholders/users can be helpful in effectively shifting the paradigm from a single-sector to a cross-sectoral view. It is envisioned that such views will act as multiplier of benefits coming from climate services, especially for those sectors strongly competing and interacting in SSA.

Some of the important outcomes of the ARC include:

- New data, tools and knowledge generated by current research programmes are made accessible to wider research and user networks to ensure uptake and effective use of climate information;
- Summaries of lessons, success stories, good practices and challenges shared between climate research and adaptation projects in Africa, and with users, practitioners, private sector, policy makers and development partners.
- Coordinated recommendations to contribute to updating the African climate research agenda and scaling up of its activities;
- Practical proposals on bridging the gap between research, operational services and policy, and sustaining existing research efforts.

FUTURE EARTH: A KNOWLEDGE ACTION NETWORK FOR SUSTAINABLE DEVELOPMENT

SASSCAL Executive Director, Dr Jane M Olwoch has been serving as a member of the Interim Steering Committee for Future Earth Southern Africa since February 2019.

Future Earth Global was founded in 2015 as an international research program designed to provide the knowledge needed to support transformations towards sustainability. It aims to be an inclusive global research and engagement platform with the goal to build knowledge on the environmental and human aspects of global change, and to find solutions for sustainable development. Its focus on a systems-based approach seeks to deepen the understanding of complex earth systems and human dynamics across different disciplines. Future Earth uses this understanding to underpin evidence-based systems,

policies and strategies for sustainable development. The Committee released the Future Earth Southern Africa (FEROSA) Operational Framework report in September 2019.

Its basic design principle has been to give a voice and influence to expertise and institutions across the globe. This is partly reflected in regional representation in science and engagement committees and the globally distributed Secretariat. Future Earth consists of a global network of scientists, researchers, and innovators collaborating towards a more sustainable planet. It harnesses the expertise, experience and reach of thousands of scientists and innovators from across the globe. This global community is spread over a series of networks, governing and advisory bodies.



Members of the Future Earth Interim Steering Committee. Far Left: SASSCAL Executive Director, Dr Jane M Olwoch

The recently released framework defines the research, funding and operational framework of FEROSA and articulates the need to develop Future Earth Regional Offices that are relevant to the regional priorities. The role of FEROSA constitutes three main engagement strategies: research; resource mobilisation; and people and partners. The proposed FEROSA aligns with Future Earth Global principles.

Regional centres and offices play a key role in Future Earth's operational structure. These centres provide a conduit for communication within and among regions and the Global Secretariat. They bring together regional partners and resources to provide the five core functions (coordination, research enabling, communication, capacity building and synthesis and foresight) of the Executive Secretariat within regions.

FEROSA is open to interested parties willing to participate in Future Earth activities. The focus is on

establishing a strong functional office in the southern African region, to promote research projects relevant to the region and enhance the global agenda.

SASSCAL's cornerstones of research, capacity development and service and product provision are aligned with Future Earth's aims of building knowledge on the environment and finding solutions for sustainable development as well as its core functions. Future Earth and SASSCAL both use science-based evidence to inform policies and strategies for sustainable development. SASSCAL has developed and strengthened the regional human capacity through degree programmes from Bachelor to Post Doctorate studies. Future Earth requires such initiatives to create a global network of scientists and researchers. Thus, synergies of innovation and collaboration for a more sustainable planet are nurtured, cultivated and strengthened.



The Grey Crowned Crane – Pictured at the Driefontein RAMSAR wetland in early December 2019

WEMAST CONSORTIUM ENGAGES WITH REGIONAL STAKEHOLDERS ON USER NEEDS ASSESSMENT

Wetland Monitoring and Assessment Service for Transboundary Basins in Southern Africa (WeMAST) is in the process of developing an online decision-support platform, which will provide wetland stakeholders in SADC with Earth Observation (EO) based wetland monitoring and assessment services, tools and information. The WeMAST project focuses on four southern African basins: the Cuvelai, the Limpopo, the Okavango and the Zambezi basin.

WeMAST is one of 13 consortia awarded grants by the GMES and Africa Support Programme. The Programme is being funded jointly by the African Union (AU) and the European Commission (EC) and is actively supported by the European Union's Earth Observation

Programme Copernicus and the EC Joint Research Commission (JRC).

SASSCAL, the lead consortium member of WeMAST, hosted an African Union Commission (AUC) delegation visit during the week of 15 to 17 October 2019. Consortium members including the South African National Space Agency (SANSA) and the University of the Western Cape were in attendance.

WeMAST hosted a regional stakeholder engagement and user needs assessment workshop in Harare, Zimbabwe. The workshop was attended by government departments, environmental management agencies, basin commission representatives, water authority representatives, research institutions and academic institutions.



Stakeholders of the WeMAST project and WeMAST consortium members at the Regional Stakeholder Engagement and User Needs Assessment Workshop

The workshop

- Gathered information on the needs, expectations and experiences of various stakeholders across the region, on the nature of the EO-based products and services that can be developed to promote sustainable wetland utilisation monitoring and assessment.
- Provided information that can inform the development of products and services that address the needs of the stakeholders and would-be users of the WeMAST platform in line with the project concept 'with the Users for the Users.'

During the workshop, the stakeholders agreed that the WeMAST platform should endeavour to provide products that support the monitoring and assessment of wetland degradation, by defining indicators for wetland change, prioritised by the stakeholders during the workshop. These include, but are not limited to,

land cover change, land use change, extent of surface water, water quality and fire frequency.

After the workshop the WeMAST consortium had an opportunity to engage with the local Chirumhanzu community at the Driefontein Ramsar wetland.



Engagement with the local Chirumhanzu community at the Driefontein RAMSAR wetland in early December 2019.

TECHNOLOGICAL TRAINING OF AGRICULTURAL TECHNICAL, EXTENSION AND RESEARCH STAFF UNDER THE INTeCRES PROJECT IN ZAMBIA

The impacts of climate change on different sectors, including agriculture, are intensifying globally. This necessitates the development of Regional Initiatives to build and develop technical capacities to respond to the impacts of climate change and to bolster communities' resilience to extreme climatic events, by reducing communities' vulnerability and improving their quality of life. This can be done by equipping technical staff, subsistence and emerging farmers with technologies that help them make precise plans and take appropriate decisions. This is achieved through one of SASSCAL's pillars - Capacity Development. In Zambia, SASSCAL successfully hosted and facilitated more than 20 training sessions under its first Research Portfolio to strengthen capacities of both technical staff as well as farmers.

The German Federal Ministry of Food and Agriculture (BMEL), through its bilateral cooperation programme, has been supporting and strengthening the agricultural sector in Zambia. The GFA Consulting Group, on

behalf of BMEL, contracted SASSCAL to implement the "Innovative Technologies to Improve Climate Resilience in the Zambian Agricultural Sector (InTeCRes)" project. The project is being implemented in partnership with the Golden Valley Agricultural Research Trust (GART), National Remote Sensing Centre (NRSC), Stellenbosch University, Zambia Agricultural Research Institute (ZARI), Zambia Air Services Training Institute (ZASTI), Zambian-German Agricultural Knowledge Training Centre (AKTC) and Zambia Meteorological Department (ZMD).

Two trainings were conducted from 5 to 8 November 2019, at AKTC on the GART Chaloshi Research Farm in Chisamba, Zambia. Nineteen participants from the project partner institutions, Mulungushi University and the Ministry of Agriculture, participated in the trainings.

Participants were trained on the use of geophysical survey instrumentation as well as weather data products and services. Participants were introduced to the electromagnetic induction applications in agriculture,



InTeCRes Training participants in Zambia



Dr. Willem Petrus De Clerk (Holding yellow piece of equipment) of Stellenbosch University demonstrating geophysical survey equipment to participants

soil data collection using the electromagnetic geophysical survey instrument, data processing, analysis, interpretation and visualisation. In relation to weather data applications in agriculture, participants were introduced to weather data access, manipulation and crop specific products and services. Participants were familiarised with the complete set of instruments that are part of the automatic weather station and soil moisture sensors installed at AKTC.

It is envisioned that the knowledge acquired from the training and the use of the geophysical survey

instrument will be very useful and enhance participants' deliverables. The equipment introduced to the participants will be used to validate the results of their soil fertility studies and will improve the quality of their research. Participants concurred that the ability to generate maps showing general soil characteristics, elevation and geology of the farm will enable them to make cost efficient soil sampling designs, fertiliser application and prepare adequate drainage and irrigation plans.

NAMIBIA NODE BOOSTS ITS TECHNICAL EXPERTISE



Ms. Hedwig Nelago Black

One of the most valuable assets in an organisation are the employees. Employing the right people is the one of the most important aspects of ensuring that SASSCAL continues to deliver its standards of excellence. In this line, the SASSCAL Namibia Node has recruited a Programme Officer.

Ms. Hedwig Nelago Black joined the SASSCAL team in November 2019. Ms Black will be responsible for assisting the Programme Coordinator in managing the Namibian Node, SASSCAL's Research Portfolio at a regional level and ensuring the day-to-day implementation of the SASSCAL Programme in Namibia.

Notes

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