

# WIMEA-ICT

## Improving East Africa's Weather Information Management through the Application of Suitable ICTs

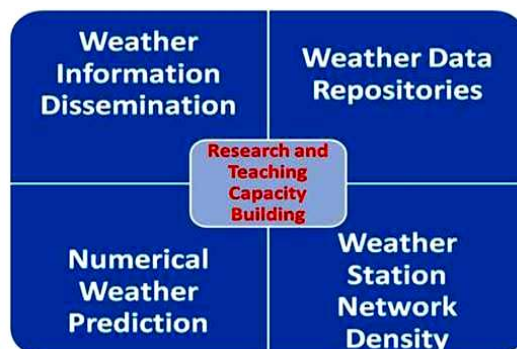
**W**IMEA-ICT is a combined research and capacity building project funded by the Norwegian Agency for Development Cooperation (NORAD) under the NORHED (Norwegian Programme for Capacity Development in Higher Education and Research for Development) scheme. The project is a cooperation between Makerere University in Uganda (host institution), Dar-es-Salaam Institute of Technology (DIT) in Tanzania, the University of Juba in South Sudan and the Geophysical Institute of the University of Bergen, Norway.

Accessibility to reliable weather information is vital for decision making in various sectors such as agriculture, disaster management, aviation, fishing, energy, mining, construction, defense, water resources and health. The methods of weather prediction and meteorological observation currently being used in the East African region are outdated and a timely dissemination of weather information is more or less absent. This has resulted into challenges such as:

1. Low agricultural productivity
2. Deaths due to weather related diseases (e.g. Malaria)

3. Delayed delivery times in the construction and energy industry
4. Loss of lives due to weather-related natural disasters (e.g. landslides, mudslides and floods) and accidents on the lakes especially Lake Victoria where about 3000 people die every year

The project therefore aims to improve **the accuracy of and access to weather information** by the communities in the East African region through suitable ICTs (Information and Communication Technologies) for increased **productivity** (in the agricultural, energy, water resources and construction sectors) and **safety** (in the aviation, disaster management, fishing, health, mining, and defense sectors) and consists of 5 main components (see figure below).



## From the Editor

I am thrilled to introduce to you the maiden issue of the WIMEA-ICT newsletter. For the next four and a half years, we shall share with you news about the project activities. In this edition, we share with you what WIMEA-ICT is about; who are the faces behind this project and the project components they will implement.



We look forward to the journey of this project which will change weather information management in not only the partner countries – Uganda, Tanzania, South Sudan and Norway but the whole region. We hope that by the end of the five years, there will be a major improvement in the techniques used to acquire, store and share weather information.

*Enjoy your reading!*  
Maria Muzaaki

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# WIMEA-ICT to build capacity in Weather Information Management

The NORHED funded project - Improving Weather Information Management in East Africa using suitable ICTs (WIMEA-ICT) will go a long way in improving the human resources in the meteorology field which according to Mr. James Akiiki Magezi currently has very few graduate staff. Mr. Magezi represented the Commissioner, Department of Meteorology during the WIMEA-ICT kick off meeting held at Emin Pasha Hotel, Kampala from 20th-22nd November, 2013.

According to Dr. Julianne Sansa-Otim, from the College of Computing and Information Sciences, capacity building is one of the project's components and will present scholarship opportunities for 5 interdisciplinary PhDs and 20 MSc. In addition customised ICT short courses for practising meteorologists will be offered. "The project also entails conducting curriculum reviews and development of new curricula for universities that lack," added Dr. Sansa, who is also the project's overall coordinator.

The meeting was attended by partners from Makerere University, University of Bergen (UiB), Dar-es-Salaam Institute of Technology (DIT) and Uganda's Government Department of Meteorology.

The WIMEA-ICT five-year project starting in December 2013 seeks to improve the timeliness and accuracy (of) as well as the access to weather information by the communities in the East African region through suitable ICTs for increased productivity (in the agricultural, energy, water resources and construction sectors) and safety (in the disaster management, fishing, health, mining, aviation and defence sectors). The project is expected to cost about NOK 18 million.

Its other components include - establishing operational Numerical Weather Prediction (NWP) models for the three countries; Creating reliable, accurate and well-formatted weather data repositories; improving the

density of the weather station network in the region; Improving the weather information dissemination system to present relevant and suitably packaged information to different stakeholders.

Prof. Joachim Reuder from the University of Bergen recommended the WRF model as well supported for numerical weather predictions. The WIMEA-ICT project will use WRF to build weather prediction models, which is likely to improve the accuracy of the weather forecasts in addition to availing them in a timely manner.



Prof. Bjorn Pehrson noted that the proposed weather stations will have sensors that measure temperature, humidity, atmospheric pressure, insolation, precipitation, wind speed and direction, soil temperature and moisture. The weather stations will be set up in two years.

According to Dr. Benjamin Kanagwa, the project will create a weather information dissemination system that presents relevant, simplified and suitably packaged information to different stakeholders in urban and rural areas to enable them make informed decisions.

"We shall adopt a mechanism for ensuring that we alert, inform and help end-users interpret and use this information," he noted, adding that they will also set up village committees and teams of indigenous knowledge expert on weather information in selected pilot villages.

The dissemination system will enable self-service, interactive voice recognition in multiple languages and open data for automated integration through API among other features.

Commenting on the proposed repository that will store Uganda's weather data upon digitisation, Mr. Andrew Mwesigwa from the Makerere University Library said the repository will be based on international standards for the aim of providing historical data to support research and meet the MET international standards. This web-based solution will be accessed even remotely. The Makerere University Library will be responsible for digitising Uganda's manual weather records.

In implementing this project, consideration will be given to ensuring that gender considerations are upheld. "Majority of staff in the Meteorology Department are male. In addition,

there is only one female among the senior members. This calls for a conscious effort to encourage and train women in the meteorology field," said Dr. Agnes Rwashana Semwanga. To overturn this, the project will ensure that at least 50% of the scholarships are awarded to females.

Dr. Semwanga, also the Deputy Principal of the College of Computing and Information Sciences added that engendering the training programme is an integral part of the project. There will be gender sensitisation workshops, networking events, mentorship talks and meetings and female students who get pregnant during the programme will receive a stipend for 6 months.

The call for applicants for the PhD courses will be out soon, while the MSc is expected to start in 2014/2015.

# NORHED project to increase accuracy of weather prediction in the region

Accurate prediction of weather is important for ensuring sustainability of our economy and population, according to Assoc. Prof. Arch. Barnabas Nawangwe, the Deputy Vice Chancellor-Finance and Administration, Makerere University.

“In Uganda we have two big challenges – a rapidly increasing population and climate change. If we do not handle these challenges then we shall have a lot of conflicts like land grabbing. In spite of the low levels of technology available, accuracy of weather prediction is very important. So this project aimed at providing timely and accurate weather information is significant for enabling sustainability of livelihoods in the region,” he added.

Assoc. Prof. Nawangwe, who represented the Vice-Chancellor, was speaking on Wednesday 20th November, 2013 during the kick-off meeting for the NORHED funded project – Improving Weather Information Management in East Africa using suitable ICTs (WIMEA-ICT) for effective service provision.

The three day event was held at Emin Pasha Hotel in Kampala, Uganda. It drew project partners from Makerere University, University of Bergen (UiB), Dar-es-Salaam Institute of Technology (DIT) and Uganda’s Government Department of Meteorology.

Assoc. Prof. Nawangwe noted that the cooperation of different units within Makerere University to work together in the WIMEA project amplifies the University’s Research Agenda that encourages multi-disciplinary research. From Makerere, the project draws on expertise from the College of Computing and Information Sciences (CoCIS), College of Engineering, Design, Art and Technology (CEDAT), the Meteorology Unit under the College of Agriculture and Environmental Sciences (CAES) and the University Library.

Assoc. Prof. Nawangwe thanked UiB, DIT and University of Juba for collaborating on this project and NORAD for providing funds under its NORHED programme. “We have enjoyed the support of the government of Norway since the 1950s and today, we are

glad that they are still our partners through programmes like NORHED.” He also lauded CoCIS for its active role in conducting research and Dr. Julianne Sansa-Otim the overall project coordinator for spearheading the initiative to begin implementing the WIMEA-ICT project.

The Principal-CoCIS, Assoc. Prof. Constant Okello-Obura noted that the project was one of the avenues through which the college is using its expertise to provide ICT solutions and innovations to propel development in Uganda and the region.

WIMEA-ICT project is a five year project funded by NORAD to a tune of about NOK 18 million. It aims at improving the timeliness and accuracy (of) as well as the access to weather information by the communities in the East African region through suitable ICTs for increased productivity (in the agricultural, energy, water resources and construction sectors) and safety (in the disaster management, fishing, health, mining, aviation and defense sectors).

The project has five components, which are - establishing operational Numerical Weather Prediction (NWP) models for the three countries; Creating reliable, accurate and well-formatted weather data repositories; Improving the density of the weather station network in the region; Improving the weather information dissemination system to present relevant and suitably packaged information to different stakeholders; as well as Research and teaching capacity building in the partnering higher education institutions in the three East African countries.

Makerere University’s Senior Legal Officer, Mr. Goddy Muhumuza shared advice on the contractual obligations accrued from the agreement between NORAD and grant recipients.

In her closing remarks Dr. Agnes Rwashana, the CoCIS deputy Principal thanked the participants for the deliberations that would make the project a success. She called for hard work and commitment from all the project partners.

## Project Consortium

### Research Partners:

- ❑ Makerere University, Uganda (*Project Leader*)
- ❑ Dar-es-Salaam Institute of Technology, Tanzania
- ❑ University of Juba, South Sudan
- ❑ University of Bergen, Norway

### Key Stakeholders:

- ❑ Government Department of Meteorology, Uganda
- ❑ Tanzania Meteorology Agency, Tanzania
- ❑ South Sudan Meteorology Service, South Sudan
- ❑ Farmer groups
- ❑ Fishing communities

### Project Components:

- ❑ Numerical Weather Prediction (NWP)
- ❑ Weather Data Repositories
- ❑ Weather Station Network Density
- ❑ Weather Information Dissemination
- ❑ Capacity Building Through research and teaching

# MAKERERE UNIVERSITY TEAM

## Dr. Julianne Sansa-Otim

Dr. Sansa is from the College of Computing and Information Sciences, Makerere University is the Project Coordinator for the WIMEA-ICT project. She will provide the leadership in the curriculum development process as well as over all coordination for all the project components among the four partnering institutions.

Dr. Sansa-Otim got her PhD on a study entitled "Measuring and Modeling the Perform-

ance of High-speed Data Transport Protocols" from the University of Groningen, in the Netherlands. Since 2002, she has worked at Makerere University School of Computing and Informatics Technology (SCIT) in several capacities.

Since 2010, Dr. Sansa-Otim is the Chair of the Department of Networks in the SCIT. Her research experience and interests include the design of internet protocols, analysis of telecommunications policy, and the evaluation of communication networks.



## Dr. Benjamin Kanagwa



He will lead the Research Component 4 team that will design and develop the weather information dissemination system (WIDS). The WIDS will present relevant and suitably packaged information to different

stakeholders in urban and rural areas in a way that it is understandable to them and they can therefore use it in decision-making.

Dr. Kanagwa a Senior Lecturer in the Department of Networks in SCIT. He holds a PhD in computer science specializing in web services from Radboud University, Nijmegen (Netherlands). His research focuses on service-oriented systems, enterprise systems and real-time systems for enterprises. Benjamin was a manager of National Incubation Center for 2 years overseeing and the nurturing several business concepts in mobile and web technology. Benjamin coordinates the software engineering research group. Some of the past projects implemented include: Mobile Innovations and Entrepreneurship (MIE) - funded by British Council and Computer Science for High School (CS4HS) - funded by Google.

## Dr. Agnes Rwashana Semwanga



integrate gender aspects in the programmes.

Agnes is the Deputy Principal for the College of Computing and Information Sciences. She holds a PhD (Computer Science), MSc. in Computer Science, BSc. Education (Mathematics, Chemistry) all from Makerere University, Uganda.

She started her lecturing career in Makerere University in 2004 and is currently a Senior Lecturer in the Department of Information Systems where she teaches courses in Information Systems and majors in modeling and simulation. Agnes worked as a Visiting Lecturer in Kigali Institute of Science and Technology (KIST) and has participated in the development and revision of curricula for the Bachelors, Masters and PhD in Information Systems for CoCIS as well as other units such as the Uganda Management Institute (Distance Learning Program) and the PhD Program in Agriculture and Rural Innovation for the former Faculty of Agriculture, Makerere University.

As the Project Gender Focal Person, Dr. Agnes Rwashana Semwanga will assist the Project coordinator in managing all the gender aspects of the project. Having been the first graduate in the PhD Computer Science program at Makerere University – She has spearheaded the mentoring and guidance of female undergraduate, graduate students and staff in Computing. Dr. Semwanga has participated in activities of the University's Directorate of Gender Mainstreaming and engendering initiatives by the Department of Women and Gender Studies. For this project, she will work closely with the Department to

## Dr. Josephine Nabukenya



Dr. Nabukenya is a Senior Lecturer and Researcher of Information Systems and Dean of the School of Computing and Informatics Technology (SCIT), at Makerere University, Uganda. In the WIMEA-ICT project she will be a Researcher in the Research Component 4 team to design the Weather Information Dissemination System (WIDS). She will also participate in curriculum development.

In addition to the WIMEA project, Josephine is also the Makerere University Principal Investigator of the HI-Train (Health Informatics Training and Research in East Africa for Improved Health Care); a project collaboration with the University of Moi, Kenya and University of Bergen, Norway. She also heads the EU-Erasmus Mundus CARIBU project on behalf of Makerere University; a Cooperation with ACP (African, Caribbean and Pacific) countries in Regional and International Bridging of Universities (Europe, Africa, & Latin America).

Josephine earned her PhD in Information Systems (Collaboration Engineering) from Radboud University Nijmegen, the Netherlands in 2008.

Her research focuses on issues related to Collaboration Engineering; Analysis and Design of Information Flow; Business Process Modeling; Enterprise Engineering and Requirements Engineering. She is a member of the Software and Enterprise Engineering (S&EE) research group of CIT; the Enterprise Engineering (EE) research network; and the Group Decision and Negotiation (GDN) research group. Josephine is also a Professional member of the Association of Computing Machinery (ACM), and a Program Committee member for several journals and conferences such as CEJCS, IJCIR, GDN, HICSS, ECIS, PRET, BI, and ICCIR among others.

Josephine is a member of the Makerere University Senate and serves on the: University Council, Council Committee of Quality Assurance, Gender and ICT; Academic Board of the College of Engineering, Design Art and Technology; and Board of Research and Graduate Training. She is also a member of the Global Engineering Deans' Council (GEDC). Josephine also chairs the Board of Governors for Makerere College School, Uganda.

## Assoc. Prof. Richard Okou



Assoc. Prof. Okou is part of the Research Component 3 team that will design and develop a low cost robust automatic weather station.

He is an Associate Professor in Department of Electrical and Computer Engineering. He holds a PhD in Electrical Engineering from University of Cape Town, a Master of Science in Sustainable Energy Engineer-

ing (KTH Stockholm) and a Bachelor of Science in Electrical Engineering from Makerere University.

Assoc. Prof Okou's research interests are centered on electrical machines, energy storage, renewable energy and smart grid systems. His contribution to the research component 3 and the overall project would be to guide and supervise PhD candidates involved in the development of the AWS.

He is a registered engineer in Uganda and a member of the Institute of Electrical and Electronics Engineers (IEEE), USA and the Institute of Engineers and Technologists (IET), UK and the Engineering Council of South Africa (ECSA). Assoc. Prof. Okou has published widely in international peer reviewed journals and conference proceedings and he is a consultant in renewable energy in the East African region and beyond.

## Andrew Mwesigwa

Andrew and a team from the University Library will be responsible for Research Component 2; digitising the manual weather records in Uganda into an electronic weather data repository to ensure reliable, accurate and well-formatted data for seasonal weather forecasts and climate research.

He is an Academic Librarian working in the Digitization Section at the Makerere University Library. The Digitisation Section is responsible for managing the Makerere University Institutional Repository. He holds a Masters in Information Systems and a Bachelors in Library and Information Science from Makerere University. Andrew previously worked as the Librarian/Website Manager for Makerere University Institute of Environment and Natural Resources.



## Assoc. Prof. C.P.K Basalirwa



Dr. Basalirwa will be part of the Research Component 1 team that will undertake the task of identifying the most suitable Numerical Weather Prediction Models for Uganda, Tanzania South Sudan as well as the other East African Region to improve weather forecasts.

Basalirwa is an Assoc. Prof. in the Department of Geography, Geo-Informatics and Climatic Sciences; Coordinating the Meteorology Unit, Climate and Water Resources Centre in the Department at Makerere

University.

Dr. Basalirwa holds a PhD and a MSc. in Meteorology from the University of Nairobi; a MSc. in Hydrology from the University College Galway, University of Ireland among other academic qualifications.

Assoc. Prof. Basalirwa has published widely in reputable journals and participated in many scientific and developmental projects which include:

- Lead author, IPCC-Third Assessment Report (TAR) chapter 10 “Africa”, IPCC, Secretariat, Geneva, Swiss.
- Team leader of the “Climate Change Experts’ “advisors to the College of Agricultural and Environmental Sciences, a Rockefeller Foundation funded project 2010 – 2013 whose major objective was to incorporate Climate Change information Science in the College Syllabi.
- Climatology Specialist on the “Adaptation to Climate Variability for Food Security in the Cattle Corridor of Uganda”; a 4 year IDRC funded project through the African Innovations Institute (AfrII) covering the Districts of Nakaseke and Nakasongola.
- Consultant on Climatology and Hydrology Impacts on Bugala Island, for the Kalangala Palm Oil Project.
- Principal Investigator on the project – “Assessing the impacts of climate change and variability on water resources in Uganda” a START, Geosphere Biosphere program (IGBP), World Research Program (WCRP) and International Dimensions Program on Global Change (IHDP), Kampala co-sponsored project.
- Lead Author on Climate of Uganda in project of an assessment of climate change and urban food production in Kampala by the University of Dar-es-Salaam and START, 2011.

Dr. Basalirwa was also an associate fellow of the Royal Meteorological Society and is currently an associate fellow of the Uganda National Academy of Sciences and Chair, Uganda Meteorological Society.

## Dora Bampangana



Dora Bampangana will assist with project management. She is an Administrative Secretary in the Office of the Deputy Vice-Chancellor (Finance and Administration) – Makerere University having previously served as an Administrative Assistant, Graduate Studies and Research at the College of Computing and Information Sciences.

She holds a MSc in Computer Science (Management Information Systems option) from Makerere University, and Certificate in Project Identification, Development and Management from Maastricht School of Management, the Netherlands. Since 2003, Dora has been involved in and has a wealth of experience in education, research coordination and project management. Dora has excellent writing and communication skills. Her career disciplines include Management Information Systems as well as Project Development & Management.

## Maxwell Omwenga



Maxwell will design, implement and maintain the WIMEA-ICT project website.

He comes along with 8 years of vast experience in website development and web technologies, currently he is the web administrator for; College of Computing and IS, ICCIR, IJCIR, and AFRICOMM 2014.

Maxwell holds a MSC in Data Communication and Software Engineering from Makerere University.

# UNIVERSITY OF BERGEN TEAM

## Prof. Björn Pehrson

Prof. Pehrson will lead the Research Component 3 of weather station densification which entails prototyping a suitable and affordable automatic weather station and thereafter building 70 such stations for deployment in Uganda, Tanzania and South Sudan.

Björn is an adjunct professor at the Geophysical Institute of the University of Bergen and he also works in the School of Information and Communication Technology at the KTH Royal Institute of Technology. He is a member of the Telecommunication Systems (TsLab) research group.

Björn got his PhD from Uppsala University in 1975. From 1975-1985 he was an associate professor at Uppsala University, 1985-1992, he was at the Swedish Institute of Computer Science (SICS) as the research manager of the Distributed Systems Laboratory and an adjunct professor at KTH while initiating the industry-funded MultiG research programme on multimedia applications and high speed networks out of which the two startups Dynarc and Netinsight emerged. From 1992-1997, he served as head of department, 1997-2000 visiting professor at Stanford University, 2000-2005 vice dean of the School of ICT.

His current research interests include Computer and communication systems, consumer-driven research based on pre-commercial procurement strategies, networking solutions for areas of high commercial risk and dedicated networks for education and healthcare. He initiated and participated in several EU-projects, coordinated the planning of an AU-EU project establishing a pan-African broadband infrastructure for research and education networks together with current and former African KTH students.

## Prof. Joachim Reuder



Prof. Joachim Reuder will coordinate the Research Component 1: building Numerical Weather Prediction Models for Uganda, Tanzania, South Sudan as well as the East African Region.

Joachim Reuder is a Professor in Experimental Meteorology and Deputy Head of Department at the Geophysical Institute, University of Bergen, Norway.

He has more than 20 years of experience in

atmospheric boundary layer research among others in the fields of turbulence and turbulent exchange processes, air-sea interaction, atmospheric radiation, and the effects of orography on the wind field and precipitation.

In the last couple of years, Prof. Reuder is intensively working on the marine atmospheric boundary layer under the aspect of offshore wind energy installations. In this context he is leading the work package on Met-Ocean measurements in the Norwegian Center for Environmentally-Friendly Energy Research NORCOWE and the national Norwegian offshore wind energy related infrastructure projects EFOWI and OBLO.

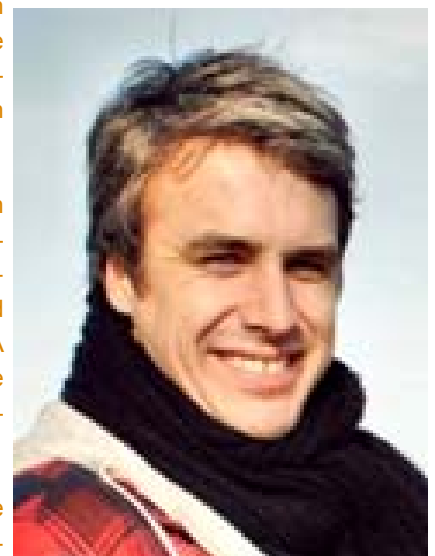
His group is continuously improving and operating the Small Unmanned Meteorological Observer SUMO as 'controllable and recoverable radiosonde' for meteorological research.

## Matthew Stiller-Reeve

Reeve is a PhD student at the University of Bergen and Uni Research in Norway. His research covers the monsoon in Bangladesh. Together with his colleagues, they try to reconcile societal perceptions with the scientific definitions of monsoon.

Reeve also works with science communication and in particular science writing and is the founder of ClimateSnack, a community of early career climate scientists who work together to improve their writing and communication skills. They aim to integrate the WIMEA ICT researchers into this community. This will improve project outreach and chances of successful high-impact publications.

Find out more about ClimateSnack on the website [www.climatesnack.com](http://www.climatesnack.com). He is looking forward to working with the WIMEA-ICT project!



## Valerie Kumer



Valerie Kumer is a PhD student at the Geophysical Institute, University of Bergen in Norway. Her PhD is in the field of experimental wind energy meteorology in which she studies wind turbine wakes with Doppler LiDAR wind measurements. Becoming a student in the Research School of Climate Dynamics (Resclim) triggered her interest in scientific outreach. She has participated in scientific writing workshops and published on ClimateSnack. Kumer works with Mathew in spreading ClimateSnack to other Universities.

He is currently leading the NFR funded project HIMWARC focusing on high impact weather in the Arctic. He is a member of the International Commission of Dynamic Meteorology (ICDM) and contributes to the World Meteorological Organisation (WMO) World Weather Research Program (WWRP) Polar Prediction Project (PPP). Dr. Spengler is currently chairing the organization of an international joint ICDM-PPP workshop on the Dynamics of Atmosphere-Ocean-Ice Interactions in high latitudes, which will take place in Norway in March 2015.

## Dr. Thomas Spengler



Dr. Thomas Spengler (UiB) is part of the curriculum development team. He is associate professor in dynamic meteorology with research expertise in dynamical meteorology bridging theory, modelling and observations. He has led and participated in several field experiments related to orographic flows and polar low development (AllgEx, FLOHOF, IPY-THORPEX, ACCACIA).

He is a co-chair in the organization committee of the ECRA and WWRP-PPP workshop on "Polar-lower latitude linkages". Dr. Spengler was nominated for the IAMAS early career scientist medal in 2013.

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## Dar-es-Salaam Institute of Technology Team

### Amos Nungu



Amos Nungu (PhD) will coordinate the DIT project activities and lead the Research Component 2 on digitising manual weather records into electronic weather repositories to ensure reliable, accurate and well-formatted data for seasonal weather forecasts and climate research.

He is a Lecturer at the Department of Computer Engineering, and Head of the National Centre of Excellence in ICT (CoEICT), Dar-es-Salaam Institute of Technology (DIT) in Tanzania. He is currently also the CEO of the Tanzania Education and Research Network (TERNET).

He holds a BSc in Computer Science from UDSM of Tanzania, MSc and PhD degrees in telecommunication systems from the Royal Institutes of Technology (KTH) of Sweden.

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### Daudi Mboma



Daudi Mboma is an Instructor at Dar-es-salaam Institute of Technology.

He is a graduate of the Institute of Finance Management with a Masters of Science IT & Management. He has an extensive experience in IT specialized in Business applications.

He has been involved in number of government projects including; The ICT for Secondary School Teachers (Ministry of Education) and the Vocation Training and Telemedicine project (Ministry of Health and Social Welfare).



# UNIVERSITY OF JUBA TEAM

## Ben Samuel Khemis

Khemis is part of the team to implement Component 3 of weather station densification. He heads the Department of Physics, College of Applied and Industrial Sciences.

Ben holds a MSc in Wireless Communication Technologies; Glasgow Caledonian University; Scotland UK and a Bachelor of Science Technology (Physics); Kyambogo University, Uganda.



## Ben Salibaa Lagure

Salibaa is a Senior Lecturer in the Department of Physics, University of Juba. His research focus is in meteorology, in the area of numerical weather prediction (NWP) using computer-based analysis.

For the WIMEA-ICT project, Salibaa will be part of the Research Component 1.

## David Aggrey Lukudu

Lukudu is part of the team to develop the Weather Information Dissemination System (WIDS). David is a Computer Science lecturer at the University of Juba having previously worked at with the South Sudan DDR Commission.

He holds a Master's degree in Computer Science from, Khartoum University, a Bachelor's Degree in Computer Science from Mbarara University of Science and Technology, Uganda.

## Other team members:

1. Edward Andrew Ashiek - *University of Juba, South Sudan*
2. Ruth Mbabazi - *Makerere University, Uganda*
3. Doreen Nerima - *Makerere University*
4. Dr. Edwin Rutalebwa - *Dar-es-Salaam Institute of Technology, Tanzania*
5. Miss. Khadija Selemani - *Dar-es-Salaam Institute of Technology, Tanzania*
6. Dr. Florence Mamboya - *Dar-es-Salaam Institute of Technology, Tanzania*

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