

**WASCAL**  
**climate**  
**news**  
THE OFFICIAL NEWSLETTER OF WASCAL



Building partnerships to combat climate change and improve livelihoods



# EDITORIAL

It's been a very busy quarter for WASCAL, even as the organization prepares towards the end of 2017. The remaining months are characterised by strategic meetings, workshops and conferences. In this edition of CLIMATE NEWS, one key thing that is dominant is the relationship efforts WASCAL continues to build in its commitment to become the preferred choice in West Africa in combatting climate change and improving livelihoods.

Professor Jimmy Adegoke, Executive Director of WASCAL shares light on the busy partnership building schedules over the past months. The numerous climate related issues that have unbridled West Africa over the last couple of months is an indication that climate change is real in the sub-region- talk of the mudslide in Sierra Leone, the floods in Nigeria and other parts of the region.

WASCAL is building strategic partnerships with policy makers and other relevant stakeholders within the climate space to ensure that collaboratively the issue of climate change is tackled sustainably.

Nii Commey

**Editor**

[press@wascal.org](mailto:press@wascal.org)

## IN THIS ISSUE

Minister of environment assures WASCAL of Ghana government's support

4

Numerical Simulation Of Surface Energy And Water Balances Over A Semi-arid Grassland Ecosystem In The West African Savanna

7

Government of Togo Grateful to WASCAL

9

WASCAL And SASSCAL Strengthen Their Long-Term Sustainability Efforts

10

Water Resources Management Using The Wrf-Hydro Modelling System: Case-Study Of The Tono Dam In West Africa

11





## FROM THE EXECUTIVE DIRECTOR'S DESK

### BUILDING PARTNERSHIPS TO COMBAT CLIMATE CHANGE AND IMPROVE LIVELIHOODS

*Over the last couple of months I have tried to bring a new sense of mission and dynamism to leadership at WASCAL and that has translated into some visible results that we are proud of. I want to acknowledge our three directors (Prof. Janet Adelegan, Dr. Jérôme Tondoh, and Mrs. Agnes Oti-Mensah) for their tireless efforts and dedication to WASCAL. Likewise, WASCAL is lucky to have a dedicated team of researchers at our Competence Center in Ouagadougou and outstanding academic leaders serving as directors and deputy directors at our various doctoral and masters graduate school programmes. Together, they have made my task of managing and leading WASCAL much less difficult than it could have been.*

We have also invested a lot of time and effort in our core stakeholder engagement activities among our member countries. Our focus has been to raise the visibility of WASCAL and engage with our Ministerial Council members on the critical issue of member country contributions. In the last few months, I have met and paid courtesy calls on the Honorable Marie Odile Attanasso (Chair of the Ministerial Council and Minister of Higher Education & Scientific Research of the Republic of Benin); the Honorable Professor Kwabena Frimpong-Boateng (Permanent Vice-Chair of the Ministerial Council and Minister of Environment, Science, Technology & Innovation of the Republic of Ghana); the Minister of Environment of the Federal Republic of Nigeria and the Ministers of Higher Education & Scientific Research of Côte d'Ivoire, Burkina Faso and the Republic of Togo. I would like to acknowledge the support of the Board Chair Dr. Johnson Boanuh (Board Member representing ECOWAS), Professor Brice Sinsin (Board Member representing the Republic of Benin) and the First Vice-Chair of the Board, Professor Konare

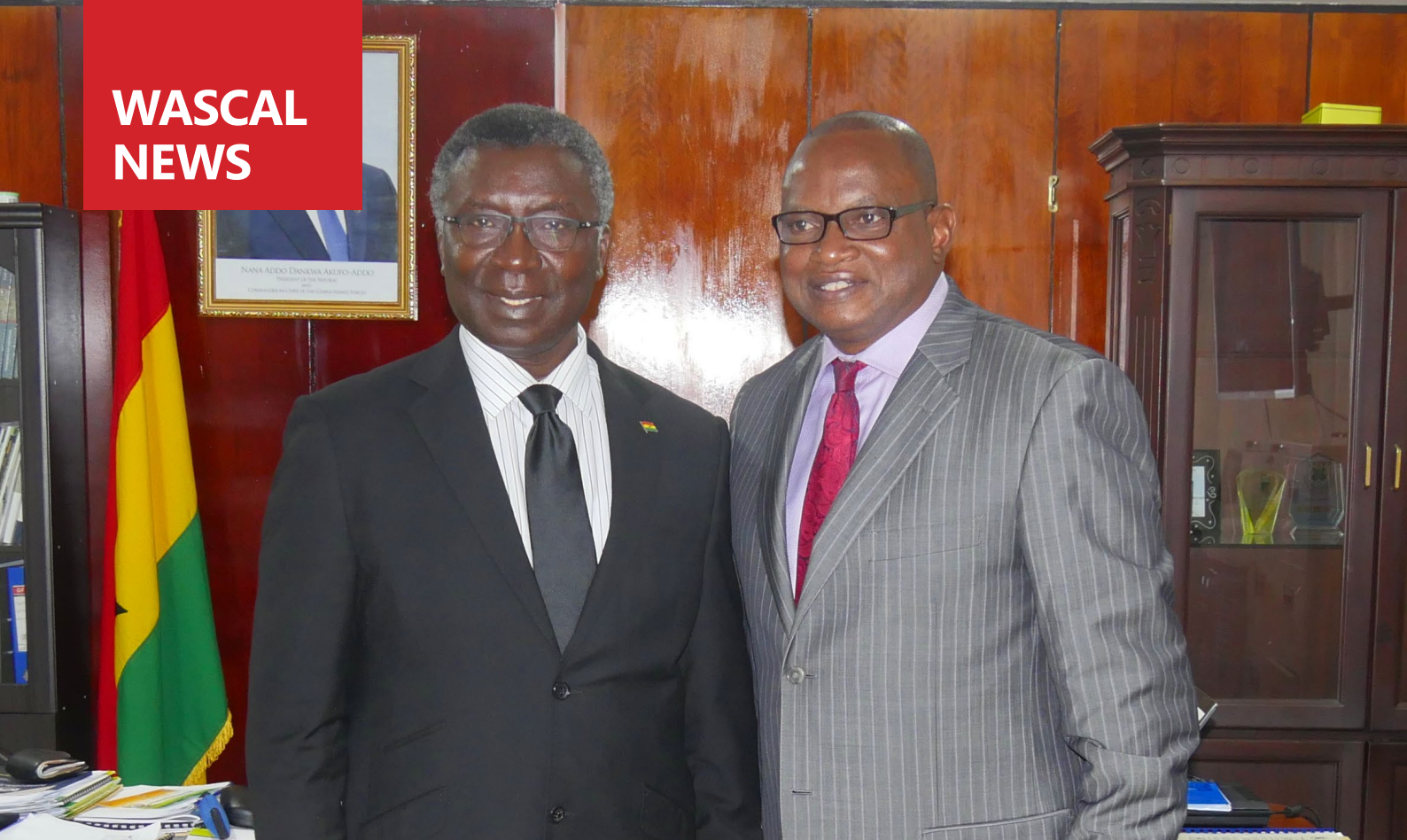


for their assistance in facilitating these courtesy calls.

With respect to partnership building, the executive management has made concerted efforts to leverage the unparalleled institutional standing of WASCAL in West Africa and the goodwill that we have with key regional and international partners to develop several new strategic partnerships. I am happy to report that we have had very promising direct engagements with major multilateral funding agencies, including the World Bank, to discuss partnership, business development and funding opportunities. We have also signed new Memorandum of Understanding (MoU) with strategic partners such as West African Development Bank (BOAD); Alliance for a Green Revolution in Africa (AGRA); International Centre for Research and Development of Animal Husbandry in sub-humid Zones (CIRDES), amongst others.

To further strengthen our partnership efforts and showcase the success story of WASCAL, we organizing an official side-event at the upcoming global climate change conference, COP 23 in partnership with ZEF and SASSCAL. COP 23 will be in Bonn Germany in November. Also, from 4th to 8th December we will hold the 2017 WASCAL Week in Abidjan in partnership with the government of the Republic of Cote d'Ivoire. These are very exciting times for WASCAL as you will see in the pages of this newsletter. We invite you to sit back, relax and have a pleasurable reading.

**Prof Jimmy Adegoke**  
**Executive Director**



## MINISTER OF ENVIRONMENT ASSURES WASCAL OF GHANA GOVERNMENT'S SUPPORT

*Ghana's Minister of Science, Technology and Innovation, Professor Frimpong Boateng has assured WASCAL of the Government's support to help combat climate change and improve livelihoods in Ghana specifically, and in West Africa as a whole.*

The Minister indicated that the operations of WASCAL is very significant, considering the unique approach it has adopted in the fight against climate change, using research and building capacities of scientists. He said that WASCAL a West African cause and therefore, the various governments must endeavour to own it. He also pledged his support to ensure that Ghana fulfills its obligation to WASCAL by paying the outstanding country contribution.

Professor Frimpong gave this assurance when the Executive Director of WASCAL, Professor Jimmy Adegoke paid a courtesy call on his office to formally congratulate him on his appointment as the new sector Minister. The meeting was also to introduce WASCAL to the Ministry and to deliberate on building a stronger relationship between the government of Ghana and WASCAL.

Professor Adegoke reminded the Minister of the ministry's responsibility as the permanent vice- chair of the ministerial council of WASCAL. He also entreated him to use his office to bring a sense of renewed energy in the activities and operations of WASCAL.

The government of Ghana, in February 2017, signed the Host Country Agreement with WASCAL in fulfilment of their recognition as an international organization in Ghana.





## DEVELOPING CAPACITIES CRITICAL TO THE OPTIMAL EXPLOITATION OF SATELLITE IMAGERY

*A 3-day workshop on the use of earth observation data for effective natural resources and agricultural management in Africa was held at the headquarters of WASCAL, Accra. The workshop was organized by the Tiger Initiative of the European Space Agency (ESA) in collaboration with the West African Science Service Centre on Climate Change and Adopted Land Use (WASCAL), the University of Twente, Netherlands and the University of Energy and Natural Resources, Ghana. The workshop focused on the exploitation of the data from ESA's recently launched satellite sensors which provide global scale optical and radar data at no cost to the user.*

Delivering the keynote address, Mr Foster Mensah, the Executive Director of the Centre for Remote Sensing and Geographic Information Systems (CERSGIS), University of Ghana said the ability to properly process and interpret earth observation data, especially satellite images, can tremendously improve informa-

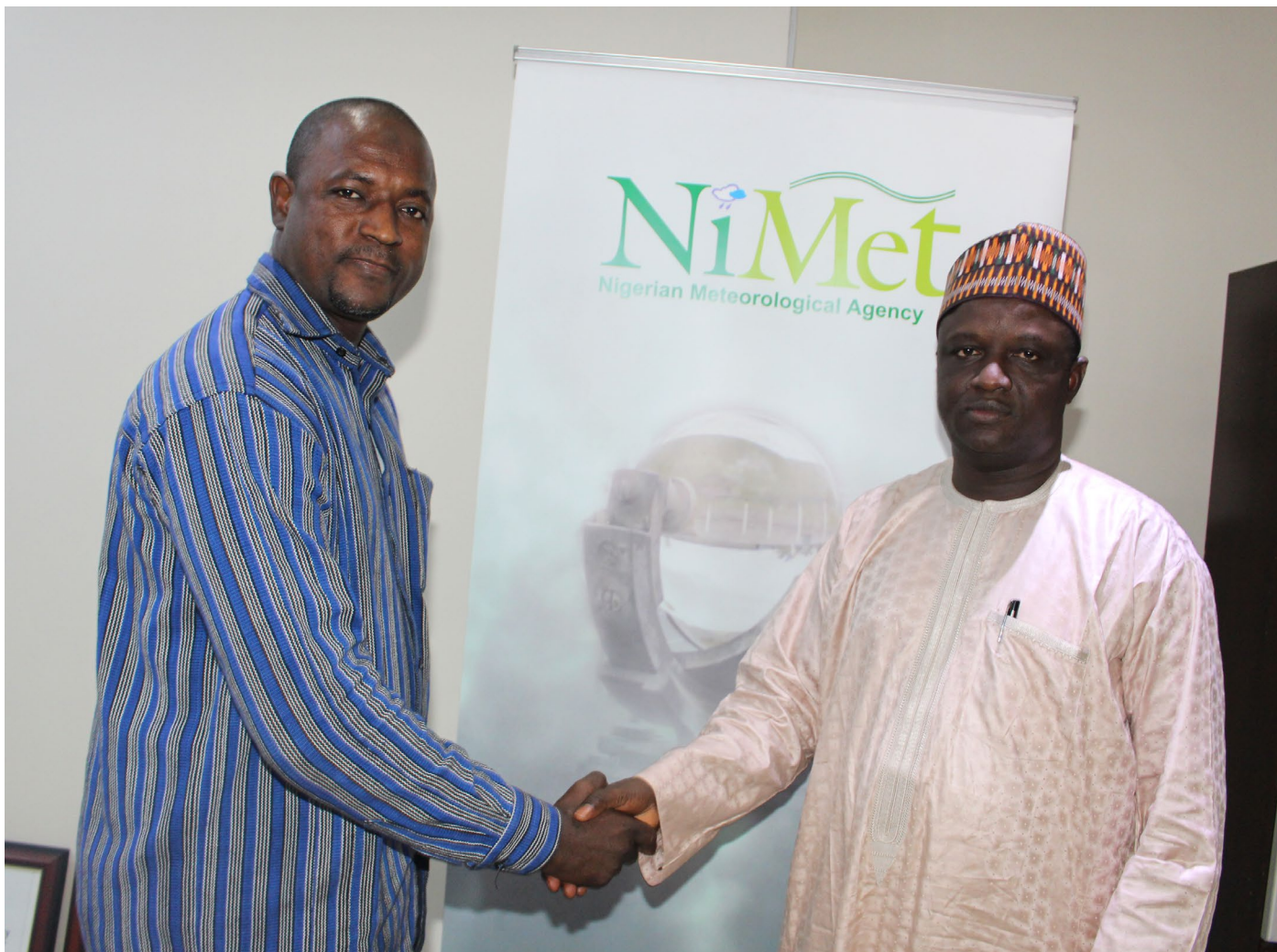
tion retrieval and consequently decision making.

He commended the organizers of the workshop for their commitment towards enhancing the capacities of geospatial practitioners in Ghana and West Africa. He said considering the mix of organizations participating in the workshop, the benefits of the training would be far reaching and assist the participants to generate critical information on natural resource management to decision makers.

"Major continental initiatives on delivering climate services based on earth observation data such as the one recently announced by the African Union will benefit from such a training, and eventually increase the resilience of human and environmental systems to climate change," he added.

Dr Gerald Forkuor, a Remote Sensing Scientist at WASCAL said the workshop was to empower participants to use the cost effective satellite images in most of their decision making process.

"We will monitor the participants, mainly Geospatial analyst and practitioners in governmental ministries and institutions, the private sector and postgraduate students, on how they use the information provided them," he added



## WASCAL DONATES 10 AUTOMATIC WEATHER STATIONS TO NIGERIAN METEOROLOGICAL AGENCY

*The DG NiMet, Prof. Sani Abubakar Mashi (R) welcomes the Coordinator, Observation Networks and Seasonal Forecasting, WASCAL, Dr. Seyni Salack who visited NiMet headquarters, Abuja, recently.*

*WASCAL has donated 10 Automatic Weather Stations (AWS) to Nigerian Meteorological Agency. This is in fulfilment of its mandate to support countries in all areas related to climate change and adapted land use.*

This was disclosed by Dr. Seyni Salack, the Coordinator, Observation Networks and Seasonal Forecasting, WASCAL when he paid courtesy call to NiMet headquarters. He explained that his mission to NiMet, was to assess the national observation networks that are available particu-

larly, the weather and climate observation network and look at the possible ways of WASCAL supporting see how WASCAL can support NiMet to upgrade and increase their numbers for efficient management of the whole system.

The Director General of NiMet Professor Sani Abubakar Mashi, expressed his delight at the gesture. He promised to maintain the standard and pledged to cooperate and support all activities of WASCAL.

As part of the partnership, WASCAL engaged NiMet technical officers in a three-day workshop on Climate, Infrastructure and Services. Participants were drawn from the Weather Forecasting, Applied Meteorological, Information Communication Technology and Engineering.

The workshop was specific objectives of WASCAL, which seeks to evaluate and rehabilitate existing Equipment/Sites /Observatories, increase the number of observation sites, skills, train technical staff involved in observations and related services.



# NUMERICAL SIMULATION OF SURFACE ENERGY AND WATER BALANCES OVER A SEMIARID GRASSLAND ECOSYSTEM IN THE WEST AFRICAN SAVANNA

*Emmanuel Quansah, Genki Katata, Matthias Mauder, Thompson Annor, Leonard K. Amekudzi, Jan Bliefernicht, Dominikus Heinzeller, Ahmed Balogun, and Harald Kunstmann,*

To understand surface energy exchange processes over the semiarid regions in West Africa, numerical simulations of surface energy and water balances were carried out using a one-dimensional multilayer atmosphere-SOil-VEgetation (SOLVEG) model for selected days of the dry and rainy seasons over a savanna grassland ecosystem in Sumbrungu in the Upper East region of Ghana. The measured Bowen ratio was used to partition the residual energy into the observed sensible heat flux ( $H$ ) and latent heat flux (LE) in order to investigate the impact of the surface energy closure on model performance. The results showed that the model overall reproduced the diurnal changes in the observed energy fluxes, especially the net radiation ( $R_n$ ), compared to half-hourly eddy covariance flux measurements, for the study periods.

The performance measure in terms of the correlation coefficient ( $R$ ), centred root mean square error (RMSE), and normalized standard deviation ( $\sigma$ ) between the simulated  $H$  and LE and their corresponding uncorrected observed values ranged between  $R = 0.63$ – $0.99$  and  $0.83$ – $0.94$ ,  $RMSE = 0.88$ – $1.25$  and  $0.88$ – $1.92$ , and  $\sigma = 0.95$ – $2.23$  and  $0.13$ – $2.82$  for the dry and rainy periods respectively, indicating a moderate to good model performance. The partitioning of  $H$  and LE by SOLVEG was generally in agreement with the observations during the dry period but showed clear discrepancies during the rainy period, particularly after rainfall events. Further sensitivity tests over longer simulation periods (e.g., 1 year) are required to improve model performance and to investigate seasonal exchanges of surface energy fluxes over the West African Savanna ecosystems in more details.

## PERSONALITY PROFILE

### MRS. AGNES OTI-MENSAH IS THE NEW DIRECTOR OF FINANCE AND ADMINISTRATION

*Mrs. Agnes Oti-Mensah has been appointed as the new Director of Finance and Administration of WASCAL effective August 1, 2017. The position became vacant after the resignation of Mr. Rainer Pruess who served in the same capacity for two- and half years.*

As the Director of Finance and Administration, she will develop and lead an internal team to support the areas of Finance, Business Planning and Budgeting, Human Resources, Administration, and Information Technology for the organization. She will also play a critical role in collaborating with the senior management team in strategic decision making and operations.

Mrs. Oti-Mensah is a finance professional with over 20 years' experience in managing finance operations in the development sector. Prior to joining WASCAL, she was the Finance and Support Services Director with World Vision International, a leading multinational charity organization with responsibility for spearheading and driving significant improvements across business functions including Finance, IT, Supply Chain and Administration in Central Africa Republic, Chad, and Senegal. Mrs. Oti-Mensah also served as Finance Director for World Vision offices in Sierra Leone and Ghana where she developed viable finance strategies based on regional and global benchmarks in diverse economic environments. She led the planning, allocation, and monitoring of multi-million-dollar budgets for WASH, nutrition, health and education programming, ensuring fulfilment of stringent requirements and meeting key objectives of the programmes.

Prior to World Vision, Mrs. Oti-Mensah worked in the private sector as a Finance Officer with Hi-Fabriks Construction Company in Tema, Ghana.

Mrs. Oti-Mensah holds an MBA from University of Ghana Business School. She is also a Chartered Accountant and a member of Institute of Chartered Accountants (Ghana), as well as a Certified Fraud Examiner.

WASCAL is confident that her wealth of experience will be used to further advance the vision of the organization which is to become one of Africa's leading institutions in the provision of climate services to protect and enhance livelihoods across West Africa.





### GOVERNMENT OF TOGO GRATEFUL TO WASCAL

*The Minister of higher education and research in Togo, His Excellency, Mr. Octave Broohm has expressed the Government of Togo's appreciation to WASCAL for the international exposure it continues to give its citizens in the area of climate change education. He also thanked the Government of Germany, through the Federal Ministry of Education and Research (BMBF) for their continuous financial support.*

He also stated that he looked forward to seeing the beneficiaries positively impacting the sub-region with the acquired training and knowledge from WASCAL.

The Minister said these when the management of WASCAL paid a courtesy call on him in Lomé.

The Executive Director of WASCAL, Professor Jimmy Adegoke, expressed his confidence that the trained students will play very significant roles in the fight against the effects of Climate Change in the sub-region. He also thanked the Honourable Minister for his leadership role he has played in ensuring that Togo fulfils his financial obligations by paying its country's member contributions to WASCAL.



## WASCAL AND SASSCAL STRENGTHEN THEIR LONG-TERM SUSTAINABILITY EFFORTS

*As part of its efforts to build a long term strategy towards their sustainability, WASCAL and SASSCAL participated in a two-day fundraising workshop in Bonn, Germany, under the auspices of the German Federal Ministry of Education and Research (BMBF). The workshop brought together key stakeholders around the world, to deliberate, share experience and expertise and develop road maps towards the success of the two institutions.*

While lauding their steady growths since their inception, the Deputy Director General of BMBF, Mr. Wilfried Kraus, also challenged the two institutions to intensify their fundraising efforts to allow for the long-term sustainability they desire.

"Both institutions have developed well since their inceptions and have been able to build significant infrastructure, scientific potentials, helped greatly to building capacity and to solving important climate change-related problems in their respective regions,

as well as made significant advancement in science and politics in the West and Southern African regions." He said

"But it is now time for both institutions to reorganize their staffing structure to identify new and potential donor structures, develop networking in the sub-region and partnership at the national, regional, and continental levels and develop a joint fund-raising strategy to enable them get funding from other donors aside BMBF". He added

Presenting the state of the arts in the two institutions, Professor Jimmy Adegoke, Executive Director of WASCAL and Dr. Jane Olwoch Executive Director of SASSCAL highlighted the positive start towards the achievement of the fundraising goals by both institutions. They also emphasized the innovative initiatives and the collaborative efforts they had begun as part of the journey towards resource mobilization.

In the networking session, there were a variety of fundraising opportunities presented to WASCAL and SASSCAL by the stakeholders for considerations and strategic mapping.

WASCAL and SASSCAL are the regional climate change institutions that seek to provide climate services, climate research and capacity building training in climate change for West Africa and Southern Africa respectively, under the sponsorship of BMBF.



## RECENT PUBLICATION

### DEVELOPMENT OF AN INTEGRATED GENERIC MODEL FOR MULTI-SCALE ASSESSMENT OF THE IMPACTS OF AGRO-ECOSYSTEMS ON MAJOR ECOSYSTEM SERVICES IN WEST AFRICA

*J Environ Manage ; Belem M1, Saqalli M2.*

This paper presents an integrated model assessing the impacts of climate change, agro-ecosystem and demographic transition patterns on major ecosystem services in West-Africa along a partial overview of economic aspects (poverty reduction, food self-sufficiency and income generation). The model is based

### WATER RESOURCES MANAGEMENT USING THE WRF-HYDRO MODELLING SYSTEM: CASE-STUDY OF THE TONO DAM IN WEST AFRICA

*E. Naabil, B.L Lamptey, J. Arnault , A. Olufayo*

Water resources are a major source of economic development for most West African (WA) countries. There is, however inadequate information on these resources for the purposes of planning, decision-making and management. This paper explores the potential for using a state of the art hydrological model (WRF-Hydro) in a fully coupled (i.e. land surface hydrology-atmosphere) mode to assess these water

on an agent-based model associated with a soil model and multi-scale spatial model. The resulting Model for West-Africa Agro-Ecosystem Integrated Assessment (MOWASIA) is ecologically generic, meaning it is designed for all sudano-sahelian environments but may then be used as an experimentation facility for testing different scenarios combining ecological and socio-economic dimensions. A case study in Burkina Faso is examined to assess the environmental and economic performances of semi-continuous and continuous farming systems. Results show that the semi-continuous system using organic fertilizer and following practices contribute better to environment preservation and food security than the more economically performant continuous system. In addition, this study showed that farmers heterogeneity could play an important role in agricultural policies planning and assessment. In addition, the results showed that MOWASIA is an effective tool for designing, analysing the impacts of agro-ecosystems.



resources, particularly the Tono basin in Ghana. The WRFHydro model is an enhanced version of the Weather Research and Forecasting model (WRF)

which allows simulating river discharge. A 2-domain configuration is chosen: an outer domain at 25 km horizontal resolution encompassing the West African Region and an inner domain at 5 km horizontal resolution

centered on the Tono basin. The infiltration partition parameter and Manning's roughness parameter was calibrated to fit the WRF-Hydro simulated discharge with the observed data.

The simulations were done from 1999 to 2003, using 1999 as a spin-up period. The results were compared with TRMM precipitation, CRU temperature and available observed hydrological data. The WRF-Hydro model captured the attributes of the "observed" streamflow estimate; with Nash-Sutcliffe efficiency (NSE) of 0.78 and

Pearson's correlation of 0.89. Further validation of model results is based on using the output from the WRF-Hydro model as input into a water balance model to simulate the dam levels. WRF-Hydro has shown the potential for use in water resource planning (i.e. with respect to streamflow and dam level estimation). However, the model requires further improvement with respect to calibration of model parameters (e.g. baseflow and saturated hydraulic conductivity) considering the effect of the accumulation of model bias in dam level estimation.

## MITIGATING DROUGHTS EFFECTS ON TROPICAL AGRICULTURE SYSTEMS: THE ROLE OF IMPROVED SOIL MANAGEMENT PRACTICES IN REGULATING SOIL MOISTURE, TEMPERATURE AND CARBON LOSSES

*KOGLO Yawovi Séna (Agronomist Engineer; Msc CC&LU; PhD student, CC&LU)*

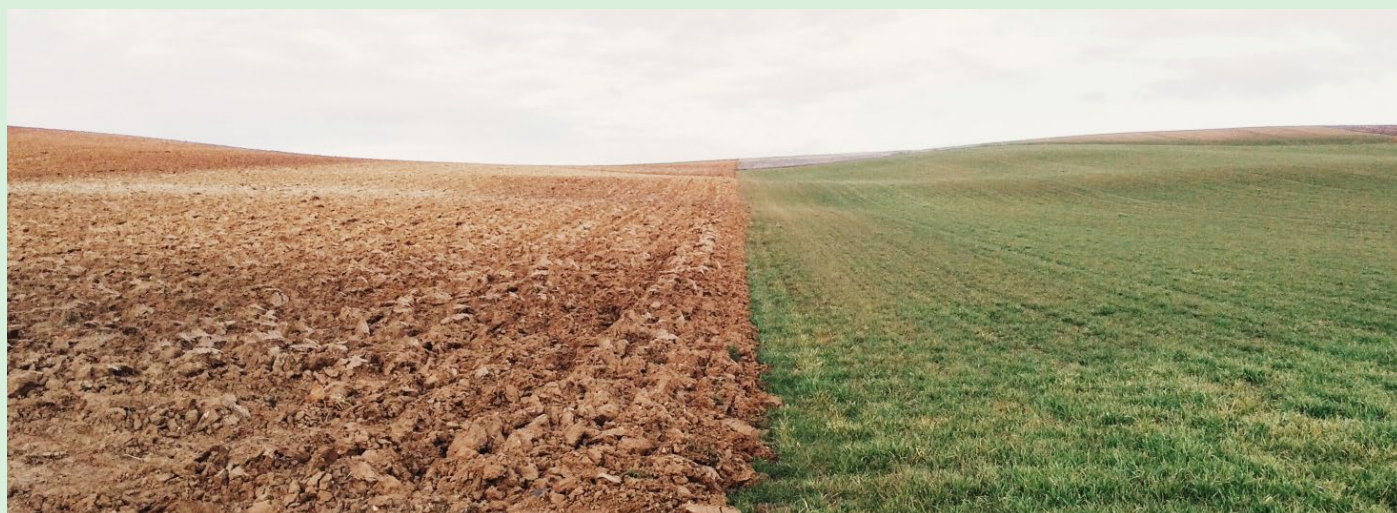
*West African Science Service Centre on Climate Change and Land Use (WASCAL CC&LU)*

*Kwame Nkrumah University of Science and Technology, KNUST, Kumasi*

Climate change is unequivocal and its threats on rain fed agriculture in the tropics is a fact. Changes in

temperature, sparse and irregular rainfall, runoff patterns entail droughts extremes, excess evapotranspiration and loss of soil moisture. These items drive soil degradation, crop production, distribution, and supply of food, and subsequently food riot and social stability. Therefore, it urges to develop and improve cost effective agricultural water management in order to increase its resilience and adaptation to climate change.

This study presents pre-wetted straw amendments effects on Soil Temperature Moisture Content and Soil Organic Carbon Density (under short-term field experiment in Nigeria. Results indicate significant difference of treatments on each parameter evaluated). Three best treatments were identified. Their responses to each variable were; Soil Temperature ) reduction was up to 20 %, Soil Moisture Content increase about 41%. Similarly, Soil Organic Carbon Density had increased to 40.3%. We then conclude that, they a valuable agricultural water management practices likely to adapt to droughts extremes on tropical rain fed agro-ecosystems while increasing resilience and adaptation to climate change.







## SIERRA LEONE ROCKED BY FLOOD

*Source: Quartz Africa Weekly Brief*

In mid-August, Freetown, Sierra Leone's capital, was rocked by its worst natural disaster in recent times as a devastating mudslide destroyed homes and buried hundreds under the debris. An unofficial death toll suggests more than 1,000 casualties as, with hundreds still missing, the possibility of finding any survivors dimmed in the days after the tragedy. Sierra Leone's president Ernest Bai Koroma described the mudslide as overwhelming and called for "urgent support."

## FLOODING IN BENUE STATE, NIGERIA HAS DISPLACED HUNDREDS OF THOUSANDS, PRESI- DENT BUHARI REPORTS.

*Source: [www.okayafrica.com](http://www.okayafrica.com)*

More than 100,000 residents in Benue State have been forced to leave their homes as a result of major flooding in the central Nigerian region.

According to Premium Times Nigeria, the floods have affected people in 24 communities.

"I have received with great concern reports of the flooding in Benue state, displacing, from early estimates, more than 100,000 people," President Muhammadu Buhari on Twitter on Thursday.

"I have directed NEMA Nigeria to immediately mobilize personnel and resources to the aid of the affected communities and persons," he wrote in another tweet. The president also promised to monitor and share "updates on the rollout of the Federal Government's humanitarian response to the Benue flooding disaster."

## FROM DRY TO WET: RAINFALL MIGHT ABRUPTLY INCREASE IN AFRICA'S SAHEL

*Source: Potsdam Institute for Climate Impact Research (PIK)*

Climate change could turn one of Africa's driest regions into a very wet one by suddenly switching on a Monsoon circulation. For the first time, scientists find evidence in computer simulations for a possible abrupt change to heavy seasonal rainfall in the Sahel, a region that so far has been characterized by extreme dryness. They detect a self-amplifying mechanism which might kick-in beyond 1.5-2 degrees Celsius of global warming -- which happens to be the limit for global temperature rise set in the Paris Climate Agreement. Although crossing this new tipping point is potentially beneficial, the change could be so big, it would be a major adaptation challenge for an already troubled region.

## UPCOMING EVENTS

COP23  
6-21 November 2017  
Bonn, Germany

WASCAL/SASSCAL SIDE EVENT  
6-21 November 2017

11th Governing Board Meeting  
19-20 October, 2017  
Accra, Ghana

WASCAL Week  
7-8 December, 2017  
Cote d'Ivoire

**UNITING FOR CLIMATE ACTION –  
FURTHER, FASTER, TOGETHER**

**OFFICIAL CLIMATE PARTNER**



**WELT.  
WORLD.  
MONDE.  
BONN.**

