

Curriculum Vitae

1. NAME Nana Ama Browne Klutse
2. ADDRESS Department of Physics
University of Ghana
Legon, Accra, Ghana
+233244983637
3. EMAIL amabrowne@gmail.com, nklutse@ug.edu.gh
4. NATIONALITY Ghanaian
5. DATE OF BIRTH 23 May 1981
6. EDUCATION

DATE	DEGREE/QUALIFICATION	INSTITUTION
February 12, 2007 - December, 14 2012	Ph.D Climatology Thesis title: Model Evaluation for Seasonal Forecasting over Southern Africa	University of Cape Town, South Africa
August 1, 1999 -June 15, 2003	B.Sc (Hon) Physics	University of Cape Coast, Ghana

Other Training (2007-2010)

- Python
- R Program
- FORTRAN
- Astronomy
- Air Quantity Sensors
- High Performance Computing
- Remote Sensing Techniques

7. POST-POSTDOCTORAL FELLOWSHIP

- June 2018 – June 2019, African Institute for Mathematical Sciences (AIMS)-Rwanda Climate Change Science Fellow, University of Cape Town, South Africa
- February 2012 - October 2014, Junior Associate, Earth System Physics, International Center for Theoretical Physics (ICTP), Italy

8. ACADEMIC APPOINTMENTS AND AFFILIATIONS

Period	Position	Institution
February 2021 – present	Associate Professor	University of Ghana

March 2020 – present	AIMS-Canada Researcher	African Institute for Mathematical Sciences (AIMS)-Rwanda
January 2014 – present	Guest Lecturer	AIMS Global (Ghana, Senegal, Cameroon, Rwanda)
March 10, 2015 - present	Guest Lecturer	WASCAL (West African Science Service Center on Climate Change and Adapted Land Use), (Nigeria)
September 1, 2014 to December 2022	Chief Examiner for Newtonian Mechanics	College of Education, University of Cape Coast

9. PREVIOUS ACADEMIC AND RESEARCH APPOINTMENT

Period	Position	Institution
August 1, 2018 – January 2021	Senior Lecturer	Department of Physics, University of Ghana
July 1, 2016 to July 31, 2018	Senior Research Scientist	Ghana Space Science and Technology Institute, Ghana Atomic Energy Commission
January 2014 to 2018	Part-time Lecturer	Department of Physics, University of Ghana
October 1, 2011 to June 30, 2016	Research Scientist	Ghana Space Science and Technology Institute (GSSTI), Ghana Atomic Energy Commission (GAEC)
February 1, 2011 to October 30, 2011	Principal Research Assistant	Physics Department, University of Cape Coast
September 1, 2004 to February 1, 2011	Senior Research Assistant	Physics Department, University of Cape Coast
September 1, 2003 to August 30, 2004	Teaching Assistant (National Service)	Physics Department, University of Cape Coast

10. ADMINISTRATIVE APPOINTMENTS

Date	Position	Institution
October 2020 – December 2022	Examination Officer	Department of Physics, University of Ghana, Ghana
August 2019 - December 2022	Colloquium Coordinator	Department of Physics, University of Ghana, Ghana
May 2017 - 2020	Chairman for working group on Ghana Space Policy	Ministry of Environment, Science, Technology and Innovation, Ghana
March 1, 2014 - July 31, 2018	Center Manager	Ghana Atomic Energy Commission, Ghana Space Science and Technology Institute, Ghana

December 1, 2011 - July 31, 2018	Coordinator of outreach activities	Ghana Atomic Energy Commission, Ghana Space Science and Technology Institute, Ghana
-------------------------------------	---------------------------------------	---

11. COMMITTEE MEMBERSHIP

- a) March 2022: 75th Anniversary celebration planning of University of Ghana
- b) February 2022: Search Panel to review applications for senior administrative positions
- c) September 2020 to Date: Graduate Studies Committee, Physics Department, University of Ghana
- d) September 2019 to Date: Management Committee of Climate Change and Sustainability Studies, University of Ghana
- e) 2019: University of Ghana Review of Ghana Space Draft Policy for Ministry of Environment, Science, Technology and Innovation

12. MANUSCRIPT REVIEWS FROM JOURNALS

- Ecological Engineering - 2 reviews per year
- Climate Dynamics - 4 reviews per year
- Atmospheric Research Letters - 2 reviews per year
- International Journal of Climatology - 3 review per year
- Climate Services - 2 review per year
- Atmosphere - 5 review per year

13. HONORS AND AWARDS

- Sustainable Development Goals (SDG) award, Recognition for contribution on Goal 13 – Kumasi, Ghana; 7 January 2020
- Contribution to Science, Recognition for a Woman in Science – Kigali, Rwanda; 13 February 2019
- 2018 Icon for World Intellectual Property Day – Accra, Ghana; April 2018
- 2014 Best Worker Award for GSSTI, GAEC – Accra, Ghana; 19th December 2014
- Best Poster Award for Poster session 3 on Regional focus - International Conference on Regional Climate, CORDEX 2013 - Brussels, Belgium; 4-7 November 2013
- Schlumberger Faculty for the Future award – Cape Town, South Africa; 2008-2010
- DAAD In-Country-In Region Award – Cape Town, South Africa; 2008-2010
- AMMSI Postgraduate student award – Cape Town, South Africa; 2009
- UNESCO award on Basics Physics for young scientist – Accra, Ghana; 2008-2009

14. CURRENT RESEARCH FOCUS

My research area is Atmospheric Physics. It focuses on understanding atmospheric dynamics, climate variability and impacts on the existence of human, ecosystem and our environment. Specific areas under my board field of interest are listed below:

- Understanding climate dynamics and variability from observations to projections - mean and extremes.
- Climate impacts assessment on health, energy, agriculture, water resources, disaster risks and gender.

- Climate services by transforming historical and projected climate data into useful information for planning and decision making in health, energy, agriculture, water resources, and disaster risks reduction.
- Space Science and Earth observation
- Atmospheric disturbances

On-going research projects

Coastal Community Resilience to Climate Change and Diarrhoea (C2R-C2D) (FY 2020-2025):

The C2R-CD aims at generating knowledge in support of resilience building to climate change and improved diarrhoeal management in coastal communities. The project is funded by Danish Development Agency (DANIDA). Project partners include University of Ghana, University of Aarhus, Denmark), the Environmental Protection Agency (EPA) Ghana, People's Dialogue on Human Settlements (PD) Ghana. Building Stronger Universities Project III, University of Ghana, Ghana

Building Stronger Universities Project III (BSUIII) (2019-2021) - Climate Change: Under this project, the research focuses on the impact of climate change and extreme climate on crop farming: mitigation and adaptation strategies. It includes the suitability of crops yield under climate change and climate variability in Ghana.

Other Research

Understanding the climate dynamics of Africa, climate observations and projections for climate services. Understanding the climate impact over Africa remains a challenge due to paucity of accessible and quality observational data and lack of research. This research provides a comprehensive assessment of the past, present and future climate of Africa. It also develops tools to improve our understanding of the driving mechanisms of the climate system and finally provides guiding principles for sectors relevant climate services for implementation and development planning.

15. GRANT SUPPORT

- **Co-Investigator: Coastal Community Resilience to Climate Change and Diarrhoea (C2R-C2D) (2020-2025):** Funded by Danish Development Agency (DANIDA). Project partners include University of Ghana, University of Aarhus, Denmark), the Environmental Protection Agency (EPA) Ghana, People's Dialogue on Human Settlements. Total Funds: 1.8 million USD.
Specific Assignment: WP1- Biophysical and Climate3 Related Studies Field Action Plan and WP4 - Integrated Assessment and Scenario Building
- **Co-Investigator:** AMMA-2050 project (36,850 GBP) from 2015 to 2018. Hosted by the Department of Physics, University of Cape Coast.
Specific Assignment: Research on extreme climate dynamics, Teach and supervise research on West African climate.
- **Principal Investigator:** Climate effect on food security: Space technology for precision agriculture. TWAS individual grant award (12,000 USD) for equipment from May 2015 to 2017.
- **Co-Investigator:** International Atomic Energy Agency climate and energy project September 2012-2015
Specific Assignment: Lead investigation on the techno-economic Evaluation of Options for Adapting Nuclear and other Energy Infrastructure to Climate Change and Extreme Weather for Ghana.

- **Co-Investigator:** Partnership for Enhanced Engagement in Research (PEER) Science (54,300 USD) 2012-2014. Hosted by the Department of Physics, University of Cape Coast.
Specific Assignment: Teach and supervise M.Phil research on the West African climate.
- **Co-Investigator:** Building Capacity to meet Climate Change Challenge (B4C) in Ghana. A partnership between University of Ghana and Open Society Foundation (1.6 million USD) 2011-2015.
Specific Assignment: Lead research on climate impact on health research.

16. CONSULTANTSHIPS AND SERVICE

- 2021: Integration of Flood and Drought Management and Early Warning for Adaptation to Climate Change in the Volta Basin, WMO
- 2020: Long Term Low Carbon, Climate-Resilient Agricultural Development Pathways for Ghana
- 2019: Ghana National Framework for Climate Services, ECOWAS
- 2019: Private Sector Engagement in Climate Information Services in Africa, ACPC/TCND, UNECA
- December 2021: Panel Member - GTEC.
 - Evaluation of programmes at the Kwame Nkrumah University of Science Technology
 - ◆ M.Phil Meteorology and Climate Change
 - ◆ B.Sc Meteorology and Climate Change
 - ◆ PhD Meteorology and Climate Change
 - Evaluation of programmes at the University of Cape Coast
 - ◆ PhD Physics
 - ◆ M.Phil Physics
 - ◆ B.Sc Physics
 - ◆ B.Sc Meteorology and Atmospheric Physics
 - ◆ B.Sc Engineering Physics
- August 2019: Panel Member - National Accreditation Board.
 - Evaluation of programmes at the Kwame Nkrumah University of Science Technology
 - ◆ MSc Energy and sustainable Management (IDL) programme
- November 2018: Panel Member - National Accreditation Board.
 - Evaluation of programmes at the Council for Scientific and Industrial Research (CSIR)
 - ◆ M.Sc Climate Change and Integrated Natural Resource Management
 - ◆ M.Phil Climate Change and Integrated Natural Resource Management
- 2017-2018: Developing Climate information for Ghana Agricultural Insurance Pool (GAIP). Private Insurance Company.
- April 2017: Panel Member - National Accreditation Board.
 - Evaluation of programmes at the University of Energy and Natural Resources
 - ◆ B.Sc Climate Change and Sustainable Development
 - ◆ M.Sc Climate Change
 - ◆ M.Phil Climate Change
- 2015: Developing and implementing a method for capturing, recording and disseminating best practices and lessons learned under the climate change and health project and also for incorporation into the health sector central database. Ministry of Health, UNDP, GEF.
- 2014: Incorporating Gender-Sensitive Actions in the 2014-2017 Health Sector Medium Term Development Strategy under Integrating Climate Change into the Management of Priority Health Risks in Ghana project. Ministry of Health, UNDP, GEF.
- 2014: Case Study 3 (Gulf of Guinea) in Case Studies on Climate Change and African Coastal

17. PROFESSIONAL SOCIETY MEMBERSHIPS

2022-Date: GMES and Women in Africa

2014 – Date: Member, AfriGEOSS

2014 – 2019: General Secretary, Ghana Institute of Physics

2008 – 2011: Member, South African Society for Atmospheric Science (SASAS)

2008 – 2010: Member, Schlumberger Faculty for the Future Fellowship

2006 – Date: Member, International Federation of University Women (IFUW)

2006 – Date: Member, International Network of Women Engineers and Scientists (INWES)

2006 – Date: Member, Organization for Women in Science for the Developing World (OWSD)

2004 – Date: Member, Ghana Institute of Physics

2002 – 2003: Member, National Society of Black Engineers, Ghana Chapter

1999 – 2003: Member, Physics Students Union of Ghana (PHYSAG)

18. COMMUNITY AND EXTENSION SERVICE

I. International Assignments

- Representing Ghana on 56th Session of the IPCC and 14th Session of Working Group III - 21 March to 1 April 2022
- Co-Chair, contact group at IPCC 56th Session on the approval of Working Group III, March 2022
- Representing Ghana on IPCC 55th Session, Virtual, 14-28 February 2022
<https://www.ipcc.ch/event/ipcc-55-and-wgii-12/>
- Co-Chair, contact group at IPCC 55th Session on the approval of Working Group II, February 2022
- Member of Research Advisory Panel, South African Weather Service, 2022-2024
- Board Member, UNESCO International Basic Science Programme 2021-2023
- Point of Contact, CORDEX Africa 2021
- Editor, PLOS Climate Section 2021
- Representing Ghana on IPCC 52nd Session, Paris, France 24-28 February 2020
<https://www.ipcc.ch/meeting-doc/ipcc-52/>
- Member of Task Group on Data for Intergovernmental Panel on Climate Change (IPCC), WMO, from 2019 to present <https://www.ipcc.ch/2019/04/16/task-group-data-members/>
- Representing Ghana on IPCC 51st Session, Monaco 20-23 September 2019
<https://www.ipcc.ch/meeting-doc/2nd-joint-session-wgi-ii-ipcc51/>
- Co-chair of break-out-group in IPCC 51st session, Monaco 23 September 2019
- Representing Ghana on IPCC 49th Session, Kyoto, Japan 8-12 May 2019
<https://www.ipcc.ch/meeting-doc/ipcc-49/>
- Co-chair of break-out-group on Short lived Climate forcers in IPCC 49th session, 2019
- Lead Author, 6th Assessment Report for Working Group I of the IPCC, 2018-2024
<https://archive.ipcc.ch/report/authors/report.authors.php?q=35&p=&p>
- Member of steering committee, African Leadership Conference 2018-Present
- Representing Ghana on IPCC 48th Session, Incheon, South Korea October 2018
<https://www.ipcc.ch/event/48th-session-of-the-ipcc/>
- Member of expert team, AR6 Scoping Meeting of the IPCC, Addis Ababa, Ethiopia from 1 – 5 May 2017 <https://www.ipcc.ch/activities/sixth-assessment-report/>
- Member of expert team, IPCC scoping meeting of the Special Report on the Impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission

pathways 15 – 18 August 2016, Geneva, Switzerland

https://www.ipcc.ch/site/assets/uploads/sites/2/2019/03/sr15_scoping_final_list.pdf

- Member of working group, African Space Policy 2012-2015 for African Union
- Member of working group, African Space Strategy 2013-2016 for African Union
- Member of working group, CORDEX Africa 2011-Present
- Member of steering committee, African Leadership Conference Youth Forum 2012-Date
- Member of delegates from Ghana in the bid for the international year of light at UNESCO, Paris, France, October 2012
- Lead member of working group, Earth Observation: African Leadership Conference Youth Forum 2014-Date
- Member of team for the Second National Communication to the UNFCCC for Liberia 2014

II. Community Services

- Outreach for fishermen in Moree: Why fishermen get lost at sea – application of Astronomy
- Member of National team – Fourth National Communication to the UNFCCC for Ghana
- National Coordinator – International Physics Olympiad, Ghana Team
- Member of National team – Third National Communication to the UNFCCC for Ghana
- Educated maize farmers in the transition zone of Ghana on when to plant and harvest maize based on onset and cessation of rainfall. This was done under the PEER Science project from 2012 to 2014
- Developed early warning systems for floods and droughts in the northern Ghana. This was done under African Adaptation Programme of the UNDP from 2012 to 2013
- Chairman of board of directors to Children with Learning Disabilities (CLED) NGO
- Education Outreach talks in high schools in Ghana
- Patron to Abura Asebu Kwamankese Tertiary Students and Associates (AAKTSA)

III. Outreach and Motivation talks

- The Universe - Komenda College of Education, Komenda, Ghana, 6 July 2016
- Mentorship forum for adolescent girls on SGBV, Teenage pregnancy and their rights, Cape Coast, Ghana, 13-14 June 2016

IV. Coordinator/Organizer

- International Physics Olympiad July 2017, Indonesia
- International Physics Olympiad July 2016, Switzerland
- Annual Career guidance programme at Mfantsiman Girls Secondary School, Since 2016, Saltpond, Ghana
- National Physics conference, 26-28 November 2014, Accra, Ghana
- 52nd Network for Astronomy School Education-International Astronomical Union's (NASE-IAU), Accra, Ghana 28-31 July 2014

V. Committee

- 2021: Technical Advisory Committee, Nature-Based Infrastructure Global Resource Center
- 2017: Local Organizing Committee, West African International Summer School for Young Astronomers - WAISSYA, Accra, Ghana. www.astrowestafrika.org
- 2016-2017: Technical Programme Committee of the 37th International Symposium on Remote Sensing of the Environment (ISRSE-37), South African Space Agency, Pretoria, South Africa www.isrse37.sansa.org.za

- 2016: Constitution Review Committee of Research Scientist Association, GAEC, Accra, Ghana
- 2016: GAEC Lecture Series committee, GAEC, Accra, Ghana
- 2015: Technical Programme Committee, International Climate Change and National Development Conference, University of Ghana, Accra, Ghana
- 2015: Planning Committee, 8th International conference of the African Materials Research Society. University of Ghana, Accra, Ghana www.africamrs.co.za
- 2015: Communication Committee, GAEC, Accra, Ghana
- 2015: Country Programme Framework Committee, GAEC, Accra, Ghana
- 2014: Africa Scientific Renaissance Day Celebration, scheduled for 30th June 2014

19. TEACHING

A. UNDERGRADUATE LEVEL COURSES SINCE 2018

COURSE CODE	COURSE TITLE	CREDIT S	AVERAGE NUMBER OF STUDENTS PER SEMESTER
PHYS 105	Practical Physics I	1	176
PHYS 106	Practical Physics II	1	158
PHYS 143	Mechanics and Thermal Physics	3	200
PHYS 410	Project	3	3
CBAS 210	Academic Writing	3	44
PHYS 454	Contemporary Physics	2	34
PHYS 144	Electricity and Magnetism	3	299

B. POST-GRADUATE SINCE 2018

COURSE CODE	COURSE TITLE	CREDITS	AVERAGE NUMBER OF STUDENTS
CCSD 601	Climate Change: Science and Evidence	2	26
PHYS 635	Meteorology	4	3
CCSD 620	Research Methods II	2	26
CCSD 600	Long Essay	3	1
PHYS 732	Special Topics in Meteorology	3	1

C. SHORT COURSES

SN	Year	Subject Taught	Institution
1.	2020	Atmospheric Dynamics and Thermodynamics	African Institute for Mathematical Sciences (AIMS), Rwanda

2.	2019	Climate Data Analysis with R statistical program and Aqua Crop modeling	Office of Research, Innovation and Development, University of Ghana
3.	2018	Making science attractive at the basic schools in Ghana	Mfantseman Municipality Teachers
4.	2017	Climate Data Analysis with InStat Plus and R statistical program	Office of Research, Innovation and Development, University of Ghana
5.	2017	R statistical program	Center for African Wetlands, University of Ghana,
6.	2016	Data analysis and modelling with R and Digital Image Processing	Ghana Space Science and Technology Institute, Ghana Atomic Energy Commission
7.	2016	Training of trainers course on Climate Analysis under “Building Stronger Universities II”	Office of Research, Innovation and Development, University of Ghana
8.	2014	R statistical program	Center for African Wetlands, University of Ghana
9.	2014	Climate Modeling	African Institute for Mathematical Sciences (AIMS), Ghana
10.	2014	Training on climate modelling and tools	Department of Physics, University of Cape Coast
11.	2013	Climate Change Modeling with RegCM4	Regional Institute of Population Studies, University of Ghana

20. THESIS EXAMINATION

SN	Institution	Month and Year	Name of Student	Title of thesis	Programme
1.	University of Energy and Natural Resources	March 2022	Nkomo Richard	Challenges of Implementing Climate Change Mitigation Strategies in Ghana: A case study of Atwima Mponua	Atmospheric and Climate Science
2.	University of Energy and Natural Resources	February 2022	George Bush Adzi	Investigating Teacher-Student Awareness of Climate Change and its Possible Inclusion into School Curriculum: Perspective from Atwima Mponua District	Atmospheric and Climate Science
3.	University of Energy and Natural Resources	February 2022	Penn Christopher	Indigenous dry season farming practice as an adaptation mechanism to climate variability	Atmospheric and Climate Science

4.	University of Energy and Natural Resources	November 2021	Mumuni Yahaya	Assessing climate change effects and adaptation strategies of smallholder farmers in the Mamprugu Moaduri District	Atmospheric and Climate Science
5.	University of Energy and Natural Resources	November 2021	Philip Asare Peh	A Trend Analysis of Cashew Production and its Impact on the livelihood of growers in a Changing Climate in Jaman North District	Atmospheric and Climate Science
6.	University of Cape Coast	October 2021	Adeola Michael Dahunsi	Modelling and Assessing the Trends in Wave Climate over the Past Four Decades in the Coast of Gulf of Guinea	MPhil Oceanography and Limnology
7.	University of Ghana	July 2021	Eugene Oduro – Nimo	Performance Evaluation of A 315 KW Grid-Connected Solar Photovoltaic (PV) System at the Noguchi Memorial Institute for Medical Research (NMIMR)	MPhil Physics
8.	University of Ghana	May 2021	Gifty Borquaye	Influence of Seasonal Variations in Irradiance and Operating Temperature on the Performance of a Grid - Connected Photovoltaic System at Legon	MPhil Physics
9.	University of Ghana	November 2020	Benedicta Woode (10220100)	Monitoring and High-Resolution studies of some Hydroxyl and Methanol Masers in the High Mass Star Forming Region G9.62 + 0.20 E	Ph.D Physics
10.	University of Cape Coast	October 2020	Kwao John Einstein Kojo	Investigating the effect of El-NINO and LA-NINA on precipitation in the Coastal Belts of Ghana	MPhil Physics
11.	University of Energy and Natural Resources	October 2020	Augustine Oti Yeboah (UEMP1600119)	Effectiveness of Community Based Institutions in the Management of Lake Bosomtwe as an Adaptation to Climate Change	MPhil Geographic Science
12.	University of Cape Town	April 2020	Ezekannagha Ezinwanne (EZKEZI001)	Assessing the Climatic Suitability of Underutilised Crop to Future Climate Projections: A Case of Bambara Groundnut in Sikasso and Ségou, Mali	Master's thesis
13.	KNUST	October 2019	Samuel Kwabena Kwakye (1684317)	Overview of the Atmospheric Environment from Radiosonde Measurements over Coastal and Inland Stations: A Case Study of Accra and Kumasi	MPhil Meteorology and Climate Science

14.	KNUST	October 2019	Christian Ayi (2753114)	Simulation of Surface Energy and Carbon dioxide fluxes over Mixture of Fallow and Cropland Savanna Ecosystem in Ghana	MPhil Meteorology and Climate Science
15.	KNUST	October 2019	Enoch Agyei-Boateng (1684217)	Dry Season Extreme Events: Evaluation of Coordinated Regional Downscaling Experiment (CORDEX) GCM-RCM Combinations over Ghana	MPhil Meteorology and Climate Science
16.	KNUST	August 2019	Victoria Owusu-Tawiah (1684517)	Evaluation of Physics Parameterization Scheme Combinations of the WRF Model in Reproducing Extreme Precipitation Events Over Ghana	MPhil Meteorology and Climate Science
17.	University of Ghana	June 2019	Emmanuel Proven Adzri (10358809)	Monitoring and High-Resolution Observations of Periodic Methanol Masers	PhD Physics
18.	KNUST	May 2019	Samuel Kyei-Manuh (1684417)	Assessment of Mesoscale Induced Severe Weather from Thunderstorm Frequency and Derived Stability Indices	MPhil Meteorology and Climate Science
19.	KNUST	October 2018	Winifred Ayinpogbilla Atiah (20410351)	Performance assessment of Satellite and DACCIIWA Optical Gauge Rainfall Products and analysis of trends and drivers of Rainfall Extremes in Ghana	PhD Meteorology and Climate Science
20.	KNUST	September 2017	Martin Addi (2752714)	Impact of Multiscale Global Climate on Northern Equatorial Africa Precipitation Modes	MPhil Meteorology and Climate Science
21.	KNUST	August 2017	Jacob Agyekum (4624315)	Regional difference in precipitation over the Volta Basin: An Evaluation of some selected CMIP5 Global Models	MPhil Meteorology and Climate Science
22.	KNUST	April 2017	Richard Yao Kuma Agyeman (2752814)	Optimal Parameterization Scheme Combination of the Weather Research and Forecasting (WRF) Model for Seasonal Forecast Over Ghana	MPhil Meteorology and Climate Science
23.	KNUST	September 2016	Nana Kofi Ahoi Appiah-Badu	Multiscale Global Climate Analysis and Its Implications for Climate Change Adaptations Over East Africa	MPhil Meteorology and Climate Science
24.	KNUST	April 2016	Michael Baidu	Spatio-temporal Rainfall Variability over Ghana using Wavelet Analysis	MPhil Meteorology and Climate Science

21. GRADUATE STUDENT THESIS- SUPERVISION

SN	Year	Institution	Level	Title	Name of student	Student ID	Role
1.	2021-	University of Ghana	MPhil	WRF-Simulated Low Level Jets over Coastal Ghana; Characterization and its Importance.	Prince Ameyaw	10874887	Principal supervisor
2.	2021	AIMS Ghana	MSc	Assessing the effect of Greenhouse Gases on Temperature in Ghana Using ARIMA and ARDL models.	Emmanuella Paula Ama Nemuna Boateng	NA	Principal supervisor
3.	2021	AIMS Ghana	MSc	The effects of zonal wind on rainfall variability over East Africa during El Niño Southern Oscillation (ENSO)	Elysee Manimpre Gasana	NA	Principal supervisor
4.	2021	AIMS Ghana	MSc	Effects of Sea Breeze on Rainfall over West Africa	Eunice Awino Odhiambo	NA	Principal supervisor
5.	2021-	University of Ghana	MPhil	Spatio-temporal variations of particulate matter pollution with weather variables using ground and satellite derived data	James Nimo	10432954	Co-supervisor
6.		University of Cape Coast	Ph.D	Reclassification of Ghana's Agro-Ecological Zones	Nathaniel Bimpong	NA	Co-supervisor
7.	2021-	University of Ghana	Ph.D	Extreme rainfall variability and teleconnections over Southern West Africa	Rebecca Berkoh-Oforiwaa	10877476	Principal supervisor
8.	2021-	University of Zambia	Ph.D	Aligning Climate Finance to the effective implementation of climate-related sustainable development goals	Raphael Eshun	71800040 2	Co-supervisor
9.	2021-	University of Ghana	MPhil	Understanding Stochastic process for	Joshua Fafanyo	10876665	Principal supervisor

				equatorial cloud parameterization in RegCM4			
10.	2020-	WASCAL, FUTMINNA	Ph.D	Sea-level rise impacts and adaptations strategies for rural coastal communities in Ghana	Richard Adade	NA	Co-supervisor
11.	2019 - 2022	University of Ghana	MPhil	Understanding the influence of the dynamics of moisture convergence on rainfall in West Africa	Ebenezer Biney	10803812	Principal supervisor
12.	2019 - 2020	University of Ghana	M.Sc	Rising temperature and its impact on the health of Ghanaians, La Nkwantanang Madina Municipality in retrospect	Linda Sarpong	10188066	Principal supervisor
13.	2016 - 2019	WASCAL, FUTA	Ph.D	Development of an Advanced Warning System for Flood and Drought over West Africa using Climate-Hydrological Coupled Models	Gandome Mayeul Quenum	NA	Co-supervisor
14.	2016-2019	WASCAL, FUTA	Ph.D	Numerical Study of Characteristics and Influence of Tropical Easterly Jet and Quasi-Biennial Oscillation on West African Precipitation	Abdoulaye Ballo	NA	Co-supervisor
15.	2016-2020	University of Cape Coast	Ph.D	Relationship between recent rainfall regime characteristics over Southern West Africa and associated Mesoscale Convective Systems	Francis Nkrumah	PS/PYD/16/0008	Principal supervisor
16.	2016-2019	University of Cape Coast	MPhil	Dynamics of extreme events of rainfall over Ghana	Rebecca Berkoh-Oforiwaa	PS/PYP/16/0002	Principal supervisor
17.	2015-2022	University of Cape Coast	Ph.D	Trends in Daily Extreme Precipitation and Temperature indices over Ghana	Kofi Asare	NA	Co-supervisor

18.	2016-	University of Cape Coast	MPhil	Variation of Total Electron Content (TEC) in the ionosphere over Ghana using GPS Data	Linda Abakah Sikafo	NA	Principal supervisor
19.	2012-2014	University of Cape Coast	MPhil	Dynamics of Rainfall in West Africa and its variability in Ghana under Climate Change	Francis Nkrumah	NA	Principal supervisor
20.	2012-2014	University of Cape Coast	MPhil	West African Monsoon (WAM) jump and its implication for rain-fed agriculture in the Coastal and Transition zones of Ghana	Kwesi Akumenyi Quagraine	NA	Co-supervisor

22. UNDERGRADUATE STUDENT RESEARCH SUPERVISION

Year	Institution	Title	Name of student	ID
2020-2021	University of Ghana	The study of Ionospheric Total Electron Content over Ghana using IRI Model	Emmanuel Danso	10660214
2020-2021	University of Ghana	Impact of Global Warming on Dry Spells in Ghana	Mansro Grace Maku	10666379
2020-2021	University of Ghana	Fourier Synthesis Imaging of Kat-7 Response to Radio Waves Via Simulation	Joshua Attih	10667272
2019-2020	University of Ghana	Measurement of CO ₂ emissions from Electricity Consumption in Ghana	Kevin Christian Amevor	10627734
2019-2020	University of Ghana	Assessment of Inter-annual Rainfall and Temperature Variability over Ghana	Petras Anaab Ali	10618348
2018-2019	University of Ghana	Determination of cloud top temperature for rainfall variability prediction in Ghana	James Atta Bimpong Junior	10559003
2017-2018	University of Cape Coast	The impact of warming of 1.5C in average Global Temperature on Ghana's climate	Paul Wahab Ninson	PS/PHS/14/0014
2017-2018	University of Cape Coast	A study of the relationship between temperature and rainfall variability in Wa and Saltpond	Joseph Rexford Atsu	PS/PHS/14/0020
2016-2017	University of Cape Coast	Understanding the influence of the dynamics of moisture convergence on rainfall in Ghana	Botchway Collins Shane	PS/PHS/14/0016

2016-2017	University of Cape Coast	Measurement of Atmospheric pollutants: nitrogen dioxide (NO ₂) and sulfur dioxide (SO ₂) concentration in ambient air in Tema Industrial area	Ziadzor Emmanuel Anum	PS/PHS/14/0018
2016-2017	University of Cape Coast	Daily Characteristics of Rainfall Over Coastal Ghana	Adokpo_Francis	PS/PHS/14/0004
2016-2017	University of Cape Coast	Validation of Rainfall Data from Satellite and Gauge Measurement Over the Coastal Areas in Ghana	Raymond Nartey	NA

23. TEACHING INNOVATIONS

1. Physical Optics (theory and practical), **Dr Nana Ama Browne Klutse**, Dr Fiifi Mensah, Dr Baah Sefa-Ntiri, Dr Frederick Sam. Center for Continuing Education, University of Cape Coast, CCE publications, May 2017.
2. Solid State Physics (theory and practical), **Dr Nana Ama Browne Klutse**, Dr Fiifi Mensah, Dr Baah Sefa-Ntiri, Dr Frederick Sam. Center for Continuing Education, University of Cape Coast, CCE publications, May 2017.
3. Electronics (theory and practical), **Dr Nana Ama Browne Klutse**, Dr Fiifi Mensah, Dr Baah Sefa-Ntiri, Dr Frederick Sam, Center for Continuing Education, University of Cape Coast, CCE publications, October 2015.
4. Electricity and Magnetism (theory and practical), Dr Fiifi Mensah, **Dr Nana Ama Browne Klutse**, Dr Baah Sefa-Ntiri, Dr Frederick Sam Center for Continuing Education, University of Cape Coast, CCE publications, October 2015.
5. Newtonian Mechanics (theory and practical), Dr Fiifi Mensah, Dr Baah Sefa-Ntiri, Dr Frederick Sam, **Dr Nana Ama Browne Klutse**. Center for Continuing Education, University of Cape Coast, CCE publications, October 2014.
6. Introductory Atomic Physics, Heat and Optics (theory and practical), Dr Fiifi Mensah, Dr Baah Sefa-Ntiri, Dr Frederick Sam, **Dr Nana Ama Browne Klutse**. Center for Continuing Education, University of Cape Coast, CCE publications, October 2014.

24. LECTURESHIP/SEMINAR AND VISITING PROFESSORSHIP

- Public Engagement, University of Ghana, The IPCC Sixth Assessment Report - Red coded for humans 7 October 2021
- Briefing for Namibian Government, The IPCC Sixth Assessment Report: Implications on Climate Actions and Finance Needs for Africa, 4 October 2021
- Imagining Climate Futures, Africa@2050, University of Ghana and the University of St Andrews (UK), virtual workshop 30 June 2021
- A keynote - Climate Change and Agriculture in Africa: Impact Assessment and Adaptation Strategies, 23 June 2021
- Afternoons with SPMS' organised by the School of Physical and Mathematical Sciences – Climate Change, A moral and developmental Challenge: The need for modeling and future projections, 23 April 2021

- The IPCC system and involvement of Africans: the way forward, Virtual Seminar for African Group of Negotiators Experts Support (AGNES), 28th October 2020
- Current Climate Change Issues: where we have come from and where we are going, University of Ghana, Physics Department Colloquium, 18th February 2020
- Current Climate Change Issues, AIMS Women in Science (AIMSWIS) Climate Science Speaker Series, Ghana, 29th January 2020
- The Sun, The Earth, The Weather World Meteorological Day 2019, 3rd March 2019, Ghana
- Life After PhD - Schlumberger Foundation Faculty for the Future Fellows and Alumnae Forum, Cape Town, South Africa 28th – 31st August, 2016
- Pledge for Parity in Science International Women’s Day African Institute of Mathematical Science (AIMS) Ghana 8th March 2016

25. INVITATION TO NATIONAL AND INTERNATIONAL CONFERENCES AND WORKSHOPS

- African Union Women Space Expert Meeting, Benin 16th -18th March 2022
- Natural Based Solutions, Water Resource Commission and Volta River Authority Accra 15th - 17th February 2022
- Workshop by GUILD - Universities as gateways between Africa and Europe: promoting a sustainable EU-AU partnership through university collaboration. Virtual panel discussion, 14 February 2022
- The IPCC Sixth Assessment Report: Regional Information – Africa, 5 November 2021, COP26 Glasgow, UK <https://youtu.be/9o9qzAkGn8c>
- The IPCC Sixth Assessment Report, what’s in for Africa: 20 October 2021, Pre-COP26 event, Accra.
- CR4D Postdoctoral Climate Research Fellowships Closing Workshop: 21-23 June
- ARUA-CD Workshop On Climate Change Curricula For Lecturers In Africa 27 May to 1 June 2021, Virtual <https://sites.google.com/view/arua-cd-workshop>
- UNEA 5 Africa Air Quality Report Validation Workshop on ‘Actions on Air Quality’ Report Update - 25th May 2021, Addis Ababa, Ethiopia Held virtually
- African Physical Society - November 2020, ICTP, Italy held Virtual - *Presentation: Atmospheric Processes and Climate Impact*
- ICLR 2020 Workshop - Tackling Climate Change with Machine Learning, 26 -30, April 2020, Ethiopia held Virtual <https://www.climatechange.ai/events/iclr2020.html#clisciadapt-day> Role: *Panelist* <https://slideslive.com/38926837/tackling-climate-change-with-ml?time=24789s>
- Google Artificial Intelligence conference, Accra, Ghana 30-31 May 2019 – *Presentation: Artificial Intelligence for Climate Science*
- IMPACT IPCC Workshop in West-Africa, Ouagadougou, Burkina Faso 28-29 May 2019 – *Presentation: The IPCC system and the contribution of Africans*
- African Climate Week, Accra, Ghana 18 - 22 March 2019
- *Panelist: panel discussion on the Topic: “The Paris agreement: From Science to Policy for NDCs Implementation”*
- IPCC Second Lead Author Meeting, Guangzhou, China 23-30 June 2018 - *Presentation: Lead Author progress report on the 6th Assessment Report of the IPCC*
- IPCC Expert Meeting, Trieste, Italy 14-20 May 2018
- European Week of Astronomy and Space Science (EWASS), Liverpool, UK 1-8 April 2018 - *Presentation: Racial diversity in Astronomy. Poster: Characterization of the effect of*

Ionospheric Total Electron Content on radio frequency in Ghana equatorial region under the SKA project site

- CORDEX Workshop by the Climate Systems Analysis Group, University of Cape Town, South Africa 5-9 February 2018 - *Presentation: Potential impact of 1.5° C and 2° C global warming on consecutive dry and wet days over West Africa*
- CORDEX International Conference on Regional Climate, Sweden, 16-20 May 2016. - *Presentation: Relationship between the Tropical South Atlantic SST and Drought over West Africa from CORDEX*
- Early Warning System design meeting - UNEP's CLIM-WARN project 10-11 March 2015 in Nairobi
- Expert contribution to AU Space Working Group meeting on African Space policy and space strategy, Pretoria, South Africa 20-23 May 2015
- International conference on Climate Change and National Development: Harnessing Research for Sustainability, University of Ghana, Accra, 24-25 June 2015 - *Presentation: Relationship between climatic variables and diarrhoea cases in two agro-ecological zones of Ghana*
- Our common future under climate change, UNESCO, Paris 6-10th July 2015 - *Presentation: Relationship between the Tropical South Atlantic SST and Drought over West Africa from CORDEX*
- 1st AfriGEOSS Data & Infrastructure Coordination Team: Expert Group Meeting on African Space Policy, Cairo, Egypt, 21-23 July 2015 - *Presentation: Space Science and Technology in Ghana*
- Global Women's summit – leadership training conference Johannesburg, South Africa 6-7 August 2015 - *Presentation: 1. How can we acknowledge our similarities and respect our differences? 2. How can we strengthen women's roles for increased peace and development in communities, nations, and the world? 3. Presentation: How can women live in greater dignity and contribute to the well-being of other women in their communities, nations, and in the world?*
- 3rd Research Coordination Meeting (RCM) “Techno-economic evaluation of options for adapting nuclear and other energy infrastructure to long-term climate change and extreme weather”. Vienna, Austria 13th – 16th October 2015 - *Presentation: Techno-economic Evaluation of Options for Adapting Nuclear and other Energy Infrastructure to Climate Change and Extreme Weather for Ghana*
- Fifth Conference on Climate Change and Development in Africa, Victoria Falls, Zimbabwe 28-30 October 2015 - *Presentation: 1. Impact of increasing global temperature on Ghana's climate. 2. Gender-Sensitive Actions incorporation into the Health Sector of Ghana - pilot project <https://enb.iisd.org/climate/ccda5/html/enbplus172num25e.html>*
- Expert contribution to AU Space Working Group meeting on African Space Policy and Space Strategy, Sharm El Sheikh, Egypt 29-30 November 2015.
- African Leadership Conference on Space 2015 Sharm El-Shiekh, Egypt 1-4 December 2015 - *Presentation: The Prospects and Challenges of Earth Observation in Africa: The Way Forward*
- 7th ICTP workshop on the Theory and Use of Regional Climate Models, Trieste, Italy, 12-23 May 2014 - *Presentation: Representing the present-day regional climate over Southern Africa in a double nested system*

26. PUBLICATIONS

https://scholar.google.com/citations?user=_RZsX1gAAAAJ&hl=en
https://www.researchgate.net/profile/Nana_Ama_Browne_Klutse

a. Book Chapters

1. Quenum G. M. L. D., **Klutse N. A. B.**, Alamou E. A., Lawin E. A., Oguntunde P. G. (2020) Precipitation Variability in West Africa in the Context of Global Warming and Adaptation Recommendations. In: Leal Filho W., Ogugu N., Adelake L., Ayal D., da Silva I. (eds) African Handbook of Climate Change Adaptation. Springer, Cham. https://doi.org/10.1007/978-3-030-42091-8_85-1
2. Sylla M. B., Nikiema P. M., Gibba P., Kebe I., **Klutse N. A. B.** (2016) Climate Change over West Africa: Recent Trends and Future Projections. In: Yaro J., Hesselberg J. (eds) Adaptation to Climate Change and Variability in Rural West Africa. Springer, Cham https://doi.org/10.1007/978-3-319-31499-0_3 Online ISBN 978-3-319-31499-0
3. Chapter 4: The small pelagic fisheries of Ghana by **Nana Ama Browne Klutse** and Francis K.E. Nunoo. © FAO, (2016). Case studies on climate change and African coastal fisheries: a vulnerability analysis and recommendations for adaptation options, edited by Jim Anderson and Timothy Andrew. FAO Fisheries and Aquaculture Circular No. 1113. Rome, Italy. ISSN 2070-6065 ISBN 978-92-5-109218-7

b. Refereed Journal Articles

1. Nkrumah, F., Klein, C., Quagraine, K. A., Berkoh-Oforiwa, R., **Klutse, N. A. B.**, Essien, P., ... & Koffi, H. A. (2022). Classification of Large-Scale Environments that drive the formation of Mesoscale Convective Systems over Southern West Africa. *Weather and Climate Dynamics Discussions*, 1-18. <https://doi.org/10.5194/wcd-2022-61>
2. Essien, P., Figueiredo, C. A. O. B., Takahashi, H., **Klutse, N. A. B.**, Wrasse, C. M., Afonso, J. M. D. S., ... & Quagraine, K. A. (2022). Intertropical Convergence Zone as the Possible Source Mechanism for Southward Propagating Medium-Scale Traveling Ionospheric Disturbances over South American Low-Latitude and Equatorial Region. *Atmosphere*, 13(11), 1836. <https://doi.org/10.3390/atmos13111836>
3. Dogbey, F., Asilevi, P.J., Dzrobi, J.F., Koffi, H.A., **Klutse, N.A.B.** (2022). Modelling Cloud Cover Climatology over Tropical Climates in Ghana. *Atmosphere*, 13, 1265. <https://doi.org/10.3390/atmos13081265>
4. Anna Pirani, Andrés Alegria, Alaa Al Khourdajie, Wawan Gunawan, José Manuel Gutiérrez, Kirstin Holsman, David Huard, Martin Juckes, Michio Kawamiya, **Nana Klutse**, Volker Krey, Robin Matthews, Adam Milward, Charlotte Pascoe, Gerard van der Shrier, Alessandro Spinuso, Martina Stockhause, & Xiaoshi Xing. (2022). The implementation of FAIR data principles in the IPCC AR6 assessment process. *Zenodo*. <https://doi.org/10.5281/zenodo.6504469>
5. Nkrumah, F., Quagraine, K.A., Quagraine, K.T., Wainwright, C., Quenum, G.M.L.D.,

- Amankwah, A., **Klutse, N.A.B.**, (2022) Performance of CMIP6 HighResMIP on the Representation of Onset and Cessation of Seasonal Rainfall in Southern West Africa. *Atmosphere* , 13, 999. <https://doi.org/10.3390/atmos13070999>
6. Quenum, G. M. L. D., Arnault, J., **Klutse, N. A. B.**, Zhang, Z., Kunstmann, H., & Oguntunde, P. G. (2022). Potential of the Coupled WRF/WRF-Hydro Modeling System for Flood Forecasting in the Ouémé River (West Africa). *Water*, 14(8), 1192. <https://doi.org/10.3390/w14081192>
 7. Ballo, A., Omotosho, J.B., **Klutse, N.A.B.** Abiodun J. B. & Coulibaly A., The influence of quasi-biennial oscillation on West African Rainfall. *Model. Earth Syst. Environ.* 8, 1461–1480 (2022). <https://doi.org/10.1007/s40808-021-01185-6>
 8. Quenum, G. M. L. D., Nkrumah, F., **Klutse, N. A. B.**, & Sylla, M. B. (2021). Spatiotemporal Changes in Temperature and Precipitation in West Africa. Part I: Analysis with the CMIP6 Historical Dataset. *Water*, 13(24), 3506. <https://doi.org/10.3390/w13243506>
 9. Essien, P., Figueiredo, C.A.O.B., Takahashi, H., Wrasse, C.M., Barros, D., **Klutse, N.A.B.**, Lomotey, S.O., Ayorinde, T.T., Delano, G., Bilibio, A. V. (2021). Long-Term Study on Medium-Scale Traveling Ionospheric Disturbances Observed over the South American Equatorial Region. *Atmosphere*, 12, 1409. <https://doi.org/10.3390/atmos12111409>
 10. **Klutse, N. A. B.**, Owusu, K., Nkrumah, F. & Anang, O. A. (2021). Projected rainfall changes and their implications for rainfed agriculture in northern Ghana, *Weather* 99 (99) <https://doi.org/10.1002/wea.4015>
 11. Dosio A., Jury M. W., Almazroui M., Ashfaq M., Diallo I., Engelbrecht A. F., **Klutse N. A. B.**, Lennard C., Pinto I., Sylla M. B. & Tamoffo A. T. (2021). Projected future daily characteristics of African precipitation based on global (CMIP5, CMIP6) and regional (CORDEX, CORDEX-CORE) climate models. *Clim Dyn* <https://doi.org/10.1007/s00382-021-05859-w>
 12. Aidoo, K., **Browne Klutse, N. A.**, Asare, K., Botchway, C. G., & Fosuhene, S. (2021). Mapping Evapotranspiration of Agricultural Areas in Ghana. *The Scientific World Journal*, vol. 2021, Article ID 8878631, 7 pages, 2021. <https://doi.org/10.1155/2021/887863>
 13. Pović, M., McBride, V., Muheki, P., Ödman-Govender, C., Saad, S., **Klutse, N. A. B.**, ... & Tigistu-Sahle, F. (2021). Inclusive education and research through African Network of Women in Astronomy and STEM for GIRLS in Ethiopia initiatives. arXiv preprint arXiv:2102.10990.
 14. **Klutse, N. A. B.**, Quagraine, K. A., Nkrumah, F., Quagraine, K. T., Berkoh-Oforiwaa, R., Dzrobi, J. F., & Sylla, M. B. (2021). The climatic analysis of summer monsoon extreme precipitation events over West Africa in CMIP6 simulations. *Earth Systems and Environment* 5, <https://doi.org/10.1007/s41748-021-00203-y>.
 15. Quagraine, K.A., Nkrumah, F., Klein, C., **Klutse, N. A. B.**, & Quagraine, K.T. (2020). West

African Summer Monsoon Precipitation Variability as Represented by Reanalysis Datasets. *Climate* 2020, 8, 111.

16. Bichet, A., Diedhiou, A., Hingray, B., Guillaume E, N'Datchoh E. T., **Browne Klutse N. A.** & Kouakou K. (2020). Assessing uncertainties in the regional projections of precipitation in CORDEX-AFRICA. *Climatic Change*, 162, 583–601. <https://doi.org/10.1007/s10584-020-02833-z>
17. **Klutse N. A. B.**, Owusu K., & Boafo Y. (2020). Projected temperature increases over northern Ghana. *SN Applied Sciences* 2, 1339 <https://doi.org/10.1007/s42452-020-3095-3>
18. Almazroui, M., Saeed, F., Saeed, S., Nazrul Islam M., Ismail M, **Klutse N. A. B.**, & Siddiqui M.H. (2020). Projected Change in Temperature and Precipitation Over Africa from CMIP6. *Earth Systems and Environment* 4, 455–475 <https://doi.org/10.1007/s41748-020-00161-x>
19. Nkrumah, F., Vischel, T., Panthou, G., **Klutse, N. A. B.**, Adukpo, D. C., Diedhiou, A. (2019). Recent Trends in the Daily Rainfall Regime in Southern West Africa. *Atmosphere*, 10, 741. <https://doi.org/10.3390/atmos10120741>
20. Quenum, G. M. L. D., **Klutse, N. A. B.**, Dieng, D. Laux, P., Arnault, J., Kodja, J. D., & Oguntunde P. G. (2019). Identification of Potential Drought Areas in West Africa Under Climate Change and Variability. *Earth Systems and Environment* 3, 429–444 <https://doi.org/10.1007/s41748-019-00133-w>
21. Asilevi, P. J., Quansah, E., Amekudzi, L. K., Annor, T., & **Klutse, N. A. B.** (2019). Modeling the spatial distribution of Global Solar Radiation (GSR) over Ghana using sunshine duration model. *Scientific African*, 4, e00094. <https://doi.org/10.1016/j.sciaf.2019.e00094>
22. Ragatoa, D. S., Ogunjobi, K. O., **Klutse, N. A. B.** et al. (2019). A change comparison of heat wave aspects in climatic zones of Nigeria. *Environmental Earth Sciences* 78: 111. <https://doi.org/10.1007/s12665-019-8112-8>
23. Sylla, M., Faye, A., **Klutse, N. A. B.** & Dimobe, K. (2018). Projected increased risk of water deficit over major West African river basins under future climates. *Climatic Change*. 151, 247–258. <https://doi.org/10.1007/s10584-018-2308-x>
24. Pović, M., Backes M., Baki, P., Baratoux, D., Tessema, S.B., Benkhaldoun, Z., Bode, M., **Klutse, N. A. B.**, Charles, P., et al. (2018). Development in astronomy and space science in Africa. *Nature Astronomy* volume 2, pages 507–510.
25. Ragatoa, D. S., Ogunjobi, K. O., Okhimamhe, A. A., **Klutse, N. A. B.** & Lamptey, B. L., (2018). A predictive study of heat wave characteristics and their spatio-temporal trends in climatic zones of Nigeria. *Modeling Earth Systems and Environment*, pp.1-27.
26. **Klutse, N. A. B.**, Ajayi, V., Gbobaniyi, E. O., Egbebiyi, T. S., Kouadio, K., Nkrumah, F., Quagraine, K. A., Olusegun, C., Diasso, U. J., Abiodun, B. J. & Lawal, K. A. A., (2018). Potential impact of 1.5° C and 2° C global warming on consecutive dry and wet days over

27. Ghansah, B., Forkuo, E. K., Osei, E. F., Appoh, R. K., Asare, M. Y. & **Klutse, N. A. B.**, (2018). Mapping the spatial distribution of small reservoirs in the White Volta Sub-basin of Ghana. *Remote Sensing Applications: Society and Environment*. 9, 107-115.
28. Aryee, J. N. A., Amekudzi, L. K., Quansah E., **Klutse, N. A. B.**, Atiaha, W. A. & Yorke, C. (2018). Development of high spatial resolution rainfall data for Ghana, *International Journal of Climatology*, 38(3), 1201-1215 DOI: 10.1002/joc.5238
29. Quagraine, K. A., **Klutse, N. A. B.**, Nkrumah, F., Adukpo, D. C., & Owusu, K. (2017). Changes in Rainfall Characteristics in Wenchi and Saltpond Farming Areas of Ghana. *International Journal of Geosciences*, 8(03), 305. <https://doi.org/10.4236/ijg.2017.83015>
30. Mensah, C., Amekudzi, L. K., **Klutse, N. A. B.**, Aryee, J. N. A. & Asare, K. (2016). Comparison of Rainy Season Onset, Cessation and Duration for Ghana from RegCM4 and GMet Datasets. *Atmospheric and Climate Sciences*, 6, 300-309. <http://dx.doi.org/10.4236/acs.2016.62025>
31. Osei, F. E., **Klutse, N. A. B.**, & Afrifa C. G. (2016). Siting of an Engineered Sanitary Landfill in the Greater Accra Region of Ghana *International Journal of Science and Technology*. Volume 5, No. 2, February, 2016. ISSN 2049-7318
32. **Klutse, N. A. B.**, Sylla, M. B., Sarr, A., Diallo, I., et al. (2016). Daily characteristics of West African monsoon rainfall in CORDEX regional climate models. *Theoretical and Applied Climatology*, 123: 369. <https://doi.org/10.1007/s00704-014-1352-3>
33. **Klutse, N. A. B.** Abiodun, B. J. Hewitson, B. C. Gutowski, W. J. Tadross, M. A. (2016). Evaluation of two GCMs in simulating rainfall variability over Southern Africa. *Theoretical and Applied Climatology*, 123: 415. <https://doi.org/10.1007/s00704-014-1356-z>
34. **Klutse, N. A. B.**, Aboagye-Antwi, F., Owusu, K. and Ntiamo-Baidu, Y. (2014). Assessment of Patterns of Climate Variables and Malaria Cases in Two Ecological Zones of Ghana. *Open Journal of Ecology*, 4, 764-775. <http://www.scirp.org/journal/PaperInformation.aspx?PaperID=49889>
35. Emmanuel A-P., **Klutse N. A. B.**, Adomako D., Ashilevi P., Aggrey E. (2014). Ghana in the Square Kilometre Array, *Advances in Research*, 2(12): 1040-1045. Article no. AIR.2014.12.029. DOI:10.9734/AIR/2014/12228.
36. Nkrumah F., **Klutse N. A. B.**, Adukpo D. C., Quagraine K. A., Owusu K., Owusu A., Gutowski W. Jr. (2014). Rainfall variability over Ghana: Model versus rain gauge observation, *International Journal of Geosciences*, 5, 673-683. <http://dx.doi.org/10.4236/ijg.2014.57060>.
37. Gbobaniyi, E., Sarr A., Sylla, M. B., Diallo, I., Lennard, C., Dosio, A., Dhiédiou, A., Kamga, A., **Klutse, N. A. B.**, Hewitson, B., Nikulin, G., Lamptey, B. (2014). *Climatology*, annual

cycle and interannual variability of precipitation and temperature in CORDEX simulations over West Africa. *International Journal of Climatology*. 34: 2241–2257. DOI:10.1002/joc.3834.

38. Owusu, K. and **Klutse, N. A. B.** (2013). Simulation of the Rainfall Regime over Ghana from CORDEX, *International Journal of Geosciences*, Vol. 4 No. 4, 2013, 785-791. doi: 10.4236/ijg.2013.44072
39. **Klutse, N. A. B.**, Owusu, K., Adukpo, D. C., Nkrumah, F., Quagraine, K., Owusu, A., Gutowski, W. J. (2013). Farmer's observation on climate change impacts on Maize (*Zea mays*) production in a selected Agro-Ecological zone in Ghana. *Research Journal of Agricultural and Environmental Management*, Vol. 2(12), pp. 394-402, ISSN 2315 - 8719© 2013 Apex Journal International
40. **Browne, N. A. K.**, Sylla, M. B. (2012). Regional climate model sensitivity to domain size for the simulation of the West African monsoon rainfall. *International Journal of Geophysics*, 2012, Article ID 625831. DOI:10.1155/2012/625831.
41. **Browne, N. A. K.**, Abiodun, B. J., Tadross, M., Hewitson, B. (2009). Simulation of synoptic scale features over southern Africa using GCMs. *Preprints: United Nations Educational, Scientific and Cultural Organization and International Atomic Energy Agency – The Abdus Salam International Centre for Theoretical Physics IC/2009/093* Available at: <http://publications.ictp.it>

c. Published conference proceedings

42. **Klutse, N. A. B.**, (2011). Representing Synoptic Scale Features and their implications on Present-day Regional Climate Simulation over Southern Africa. TWAS/ICIPE 2011. AAS-icipe- TWAS-ROSSA Conference on “Climate Change and Food Security: The Road for Africa” Nairobi, Kenya
43. **Browne N. A. K.**, Abiodun B.J., Tadross M., Hewitson B. (2008). Seasonal Forecasting over Southern Africa using GCM's: Part 1 of Simulation of Synoptic Scale Systems – SASAS 2008: "Heritage and Rain," September 30-October 2, 2008, University of Pretoria, South Africa

d. Technical Reports

44. IPCC, 2021: Annex VII: Glossary [Matthews, J.B.R., V. Möller, R. van Diemen, J.S. Fuglestedt, V. Masson-Delmotte, C. Méndez, S. Semenov, A. Reisinger (eds.)]. In *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United

45. Gutiérrez, J. M., R. G. Jones, G. T. Narisma, L. M. Alves, M. Amjad, I. V. Gorodetskaya, M. Grose, **N. A. B. Klutse**, S. Krakovska, J. Li, D. Martínez-Castro, L. O. Mearns, S. H. Mernild, T. Ngo-Duc, B. van den Hurk, J-H. Yoon, 2021, *Atlas. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J. B. R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)]. Cambridge University Press. In Press.
46. Gutiérrez, J. M., R. G. Jones, G. T. Narisma, L. M. Alves, M. Amjad, I. V. Gorodetskaya, M. Grose, **N. A. B. Klutse**, S. Krakovska, J. Li, D. Martínez-Castro, L. O. Mearns, S. H. Mernild, T. Ngo-Duc, B. van den Hurk, J-H. Yoon, 2021, *Atlas. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J. B. R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)]. Available from <http://interactiveatlas.ipcc.ch/>
47. Gutiérrez, J. M., R. G. Jones, G. T. Narisma, L. M. Alves, M. Amjad, I. V. Gorodetskaya, M. Grose, **N. A. B. Klutse**, S. Krakovska, J. Li, D. Martínez-Castro, L. O. Mearns, S. H. Mernild, T. Ngo-Duc, B. van den Hurk, J-H. Yoon, 2021, Atlas Supplementary Material. In: *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J. B. R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)]. Available from <https://www.ipcc.ch/>
48. Agyeman, R., Owusu, K., **Klutse, N. A. B.**, Asare, K., Tachie-Obeng, E., Kasei, R. & Benefoh, D. (2020). Climate Change Vulnerability Impacts and Adaptation Assessment: Climate Scenarios and Spatial Vulnerability Assessment. In: Ghana's Fourth National Communication to the United Nations Framework Convention on Climate Change, pp. 168-192. Mensah L. (Ed.) Environmental Protection Agency (EPA). Accra. https://unfccc.int/sites/default/files/resource/Gh_NC4.pdf
49. Owusu, K., **Klutse, N. A. B.**, Tachie-Obeng, E., Asare, K. & Ayilari-Naa, J. (2015). Vulnerability impacts and adaptation assessment. In: Ghana's National Communication to the United Nations Framework Convention on Climate Change, pp. 113-120. Mensah L. (Ed.) Environmental Protection Agency (EPA). Accra. <https://unfccc.int/resource/docs/natc/ghanc3.pdf>
50. Modelling the Influence of Vegetation, Soil Moisture and Aerosols on Early Summer Southern African Climate. Mark Tadross, Igor Oliveira, Marshall Mdoka, Fiona Tummon, Genito Maure, Neil MacKellar, Babatunde Abiodun, **Nana Browne**, Olivier Crespo, Sepo Hachigonta, and Bruce Hewitson. Water Research Commission K5/1681. 2010. ISBN 978-1-77005-976-4

51. **Nana A. B. Klutse**, Ferdinand D. Mawunya, Kofi Asare, Enoch Taggoe, Benedicta Odonkor, Patrick Nii Lante Lamptey, Fred Mensah, Ernest Olerterey Narter. (2013). Climate and Society Community Of Practice (C & S Cop, Ghana), Development Of Early Warning Climate Information For Flood And Drought-Prone Districts In Northern Parts Of Ghana (Case Studies of the Sissala East District Of The Upper West Region And Mamprusi West District of the Northern Region of Ghana) submitted to AAP and UNDP 2013.

27. OTHER ACADEMIC WORK/EXIBITS

a. Ph.D Thesis

Browne, N. A. K. (2011). *Model evaluation for seasonal forecasting over southern Africa* (Doctoral dissertation, University of Cape Town).

b. Teaching Materials Developed

Member- “Climate Change Science”. A PhD Short Course developed and presented to Graduate Students at the University of Ghana, Legon under the Building Stronger Universities (BSU III) Project with support from DANIDA and ORID 25th February – 1st March 2019.

Member- “Climate Change Adaptation and Mitigation” A PhD Short Course developed and presented to Graduate Students at the University of Ghana, Legon under the Building Stronger Universities (BSU III) Project with support from DANIDA and ORID 28th October to 1st November 2019.

c. Other Publications in Science and Technology Column of Ghana Business and Finance Magazine - monthly issues

- i. January 2015: Ghana to make space debuts
- ii. February 2015: Adding nuclear power to Ghana’s energy mix
- iii. March 2015: Climate Change: opportunities and challenges
- iv. April 2015: Astronomy in Ghana
- v. May 2015: Nanotechnology and its applications: A lesson for Ghana
- vi. July 2015: International Year of Light, Ghana’s concern
- vii. August 2015: Plastics and Plastic Wastes
- viii. September 2015: The changing climate and human health: Ghana's contribution in understanding the association
- ix. October 2015: Technology involvement of the education system of Ghana: The launching of I-Think-Edu e-education system
- x. November 2015: Rainwater usage to complement pipe borne water
- xi. December 2015: Modern methods of food preservation and protection is key to national food security: The significance of irradiation
- xii. January 2016: Plasma Technology: a new area of research for Ghanaian scientists
- xiii. February 2016: The Contribution of Glass to Development
- xiv. April 2016: A Pledge for Parity in Science
- xv. March 2016: Why the ocean is never still: a scientific explanation
- xvi. May 2016: Why the ocean is salty and where does the salt come from?

c. Student Interns/Attachment Activity Supervision

- Asilevi, P. J: Programming in R, Python and climate modeling, GSSTI, 2017
- Aryee, J.N.A: Programming in R, Python and climate modeling, GSSTI, 2016
- Abakah, Linda: Atmospheric Physics, GSSTI, 2016
- Ghansah, Benjamin: Remote Sensing, GSSTI, 2016
- Mensah Caleb: Programming in R and RegCM4 modeling, GSSTI, 2015