

The West African Quaternary Research Association inaugural international workshop

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WAQUA workshop participants

The first international West African Quaternary Research Association (WAQUA) workshop took place in Ibadan, Nigeria from October 26 – 30, 2009. The workshop was organized by the members of the Workshop Organizing Committee drawn from the University of Ibadan and Nnamdi Azikiwe University, Awka, Nigeria and was co-sponsored by the International Union for Quaternary Research (INQUA), Past Global Changes (PAGES), the Paleontological Scientific Trust (PAST) and HalaalTech Quarrying and Construction Company Nigeria Limited. The WAQUA workshop participants were ceremoniously welcomed by the Vice Chancellor of the University of Ibadan who was ably represented by the Dean of the Faculty of Science Prof. Kolawale O. Adebowale after which the workshop was officially declared open by Dr. Margaret Avery – the Vice President of INQUA with African Business Portfolio and member of the Sponsoring INQUA Commission for Humans and Biospheres (HaBCOM). Other dignitaries present at the opening ceremony include the CEO Palaeontological Scientific Trust (PAST) Ms. Andrea Leenen, the president of the Nigerian Mining and Geosciences Society Prof. A. Azubuiké Elueze, and the immediate past president of the Nigerian Academy of Science Prof. emeritus David U.U. Okali representing the academy. PAGES was represented by Dr Mohammed Umer, a member of the Scientific Steering Committee.

This inaugural international workshop was aimed at enhancing the growth of Quaternary paleoscience and to generate interest among younger scientists in research works that focus on paleontology, archaeology, past environments climate, coastal erosion and sea level changes in the West African sub region. The workshop sought among other things to promote regional collaborative research and intensify the exchange of scientific information on Quaternary paleoscience. There was also the need to set priorities and form various working groups charged with the task of identifying paleoscientific issues

covering the past 2 Ma. Technical sessions were held under the theme “The West African Quaternary Paleoclimatic/Sea Level Changes and Human Responses: Evidences from Marine and Terrestrial Sources” with the aim of understanding how information stored in geological archives can be used to reconstruct environmental/climatic variability of the past 2 Ma, for climate modeling and forecasting of the future. In addition, the workshop focused on human adaptations to climatic variations and coastal erosion during the Late Quaternary.

The workshop created an enabling environment for younger and senior mentoring research scientists from across West African sub region to dialog with their counterparts from other developed countries engaged in diverse Quaternary paleoscience research areas. The primary aim was to build bridges across borders of academic disciplines, to encourage research partnership and to promote capacity building and training in Quaternary paleosciences, archeology and paleontology.

WORKSHOP TECHNICAL SESSIONS AND PARTICIPANTS

The workshop was attended by over 50 participants from different countries in West, East and Southern Africa. On the first day, the workshop started with an elaborate opening ceremony with various remarks and group photographs, keynote presentations and plenary session. Two keynote presentations were given relating to the importance of studying Africa’s multiple archives and proxies for paleo-climatic studies covering at least the last 2000 yrs in order to determine the climate change and human impact in Africa. The keynote address by Dr. Mohammed Umer pointed out that the fragmentation of West African rainforest, fragmentation of major water bodies in the Holocene are all associated with the causes of climate change and cited the impact of modern civilization on climate change. The importance of Africa’s paleo-climatic studies was considered in terms of its potentials in the areas of tropical heat engine, monsoon system, human origin, adaptation and vulnerability. The paper outlined the challenges of paleo-climatic studies in Africa to include short-term paleo-climate data, scarce documents on groundwater. It was noted that African continent provided the first evidence for monsoon variability in response to climate change mechanisms and that 19 – 23 ka precision cycle could be a forcing element for climate change in Africa.

The keynote paper by Dr. Julius Lejju, who represented EAQUA, dealt with the Holocene environmental history and human interaction based on data derived from sedimentary records and archeological findings around the Great Lake Regions of Central Africa. This paper reported a significant change in terms of environmental, socio-cultural and climate and political structures from Holocene to Present. Other papers (Ezenwa, S.O and Okoro, E; Onyegbule, G.A and Ediang, O.A) focused on the interdependencies of climate change and Groundwater budget across the West African Sahel Zone as well as their impact and consequences on coastal erosion due to sea level rise. Presentations by I.M. Akaegbobi and O.A Ediang also stressed on the meteorological phenomena affecting port and harbor operations in the coastal areas of West Africa, which include adverse weather, ocean waves, storm surges and coastal flooding. In their presentation, Edafienene et al. cited anthropogenic activities and non-ecological friendly human activities such as gas flaring, tree cutting, vehicular movement as some of the causes of

climate change. The papers by B. Orji and Sholademi et al. discussed climate change as clearly evidenced in recent temperature rise and change in rainfall pattern and amount. Impacts associated with climate change including drought, precipitation/air temperature change and poor agricultural output for food security were highlighted. Also, the physical effects of this change associated with lowlands, wetlands, estuaries, erosion development and saltwater intrusion were discussed by T.C. Davies. One of the plenary papers, presented by Ogouwale and Boko, attempted to describe the history of climate change during the Quaternary in West Africa citing examples for illustration in Benin Republic as well as to analyze the recent extreme annual rainfall variations in Benin Republic.

The second day events focused on climatic variability and human health and the consequences of ecosystem changes, livelihood and sustainability of human development during the Holocene across West Africa with a total of 16 oral presentations. The keynote presentation by Dr. Regina Folorunsho was on climate change and sea level rise adaptation options along the coastal areas. The paper pointed out that sea level changes were associated with the menace of subsidence and coastal erosions in our coastal environment. The impacts of sea level changes in form of saltwater intrusion, large scale inundation were also highlighted. Adjustment in natural and human system response to actual or expected climatic stimuli or their effects which moderate harm and exploit beneficial opportunities were recommended as adaptation measure to sea level changes. These were evaluated under retreat, accommodation and protection. It was pointed out by Antia and Malomo that adaptation to sea level changes in developing countries is often handicapped by gap in knowledge and emphasis was made on the need for co-ordination of information from different government establishment, development of natural hazard database and training for effective management and implementation of adaptation measures.

The session discussed issues related to integrated study combining marine and terrestrial proxies to correlate changes in oceanic, continental and atmospheric conditions. It was observed that historical records show that the Sahel region has experienced several shifts to more arid climate during the last glacial period. The Sahel drought was likely a climatic response to changes in Atlantic Ocean circulation and associated sea surface conditions. Regarding Late Quaternary climate variations in subtropical northern Africa, several multiproxy reconstructions illustrate the complex relationship between Sahel ecosystems and climate throughout periods of aridification, long-term climatic and environmental change in the Sahel. On glacial to interglacial time scales, western Sahel humidity has been reconstructed through grain size and bulk elemental data. In her paper read by Dr. M. Akaegbobi, Bouimetarhan et al. showed that Tropical Africa fluctuated between dry, windy and cold glacial periods and wet and warm interglacial associated with weakening and strengthening of the Africa monsoon circulation. The data indicate that abrupt onsets of arid conditions in the West African Sahel co-occur with cold North Atlantic sea surface temperatures during Heinrich surge events and have been explained by a southward migration of the ITCZ and its associated tropical rain belt by few degrees latitude over west Africa documenting the occurrence of multi-millennial droughts in the Sahel during the past 57 ka.

The data presented show that abrupt onsets of arid conditions in the West African Sahel were linked to cold North Atlantic sea surface temperatures during times of reduced meridian overturning circulation associated with Heinrich Stadials. Climate modeling by Ilham Bouimetarhan et al suggests that this drying is induced by a southward shift of the West African monsoon trough in conjunction with an intensification and southward expansion of the mid-tropospheric African Easterly Jet.

POST – WORKSHOP MEETING

There was a general meeting of all workshop participants present immediately after the technical sessions. Among other issues, the House deliberated on membership of WAQUA and its constitution, elected office bearers, and fixed the venue and date for the next WAQUA workshop. During the meeting, action priorities were set and 4 working groups were formed for implementation of these actions. It was agreed that:

- ❖ Membership should be open to all scientists working in the area of Quaternary paleoscience, paleontology and archeology in West Africa and in all the disciplines as listed in section 2 of the WAQUA meeting minutes. Consultation, linkages and networking among members and research institutions all over the world would be encouraged.
- ❖ WAQUA should be enhanced and maintained through collaboration among members using locally available laboratory instruments, exchange visits and knowledge sharing to minimize expenses.
- ❖ A WAQUA Secretariat and website should be set up to ensure transparency through circulation of information about the association and amongst members. A comprehensive list of membership and their email addresses should be compiled by the secretariat.
- ❖ All WAQUA information and announcements for now should be posted on INQUA and PAGES websites.
- ❖ An interim caretaker committee was set up to run the affairs of WAQUA until a general election is conducted. Dr. Izuchukwu Mike Akaegbobi (Nigeria) and Dr. Ibouraima Yabi (Benin Republic) were nominated and approved as Chairman and Vice Chairman respectively. Other members of the caretaker committee are Okuku Archibong Ediang (Secretary), Prof. Luke Okechukwu Anike and Dr. Nkiru Meludu.
- ❖ WAQUA constitution should be drafted and patterned after the EAQUA constitution following study of the draft copy of EAQUA constitution, which will be made available to WAQUA caretaker committee. The draft constitution will be considered and rectified in the next meeting when membership is organized.
- ❖ Four Working Groups were formed to brainstorm and arrive at priorities relating to issues in Quaternary paleoscience and paleontology. The groups are as follows:
 - Lake Sediments as Archives for Paleoclimatic Changes.
 - Coastal Sea Level Changes.
 - Ecosystem Changes and Livelihood of Human Development
 - Archaeology and Paleontology

- ❖ The manuscripts of the full papers presented during the workshop should be prepared and submitted by authors for publication in a special volume in the Quaternary International – INQUA International Journal. Also, reports and products of the workshop should be submitted to the funding bodies INQUA, PAGES, and PAST.
- ❖ The next WAQUA workshop will be held in Cotonou, Republic of Benin in 2010.