GEOHealth Consensus Building Workshop Report

May 22nd & 23rd, 2014

1.0 Preamble

1.1 Project Background

The West African Global Environmental and Occupational Health (GEOHealth) Hub is perceived to be a multidisciplinary center to be developed at, and led by, the University of The Gambia in partnership with the University of Iowa, with the aim of addressing occupational and environmental health challenges in the ECOWAS Sub-region. This Hub will be connected to other research and training institutions and agencies within The Gambia (internal spokes) and to institutions located throughout the other fourteen ECOWAS member countries (external spokes) and will be supported by several research and training centers at the University of Iowa and by institutions in several other low- and middle-income countries.

During a two-year planning period, the two primary consortium leaders (i.e. UI and UTG) will establish collaborative relationships among key partners to develop a plan on how a GEOHealth Hub in The Gambia can best meet the needs for research, research training, and curriculum development in environmental and occupational health in the West African sub-region.

The main focus of the proposed GEOHealth Hub will be rural health. This has been the unifying theme of the collaborations between the primary consortium members for the last thirteen years. Rural health is a well-recognized strength of the University of Iowa, and rural health issues are of paramount importance in West Africa.

The specific environmental and occupational health focal areas will be clearly delineated after the needs and opportunities assessment that will result from this two-year planning process. However, at this point, the most pressing rural health issues in the sub-region are identified as: water quality, workplace safety (especially agricultural work), agricultural health (especially pesticides), toxic wastes (especially dumping), and disaster preparedness and response. This project will further clarify the sub-regional research and training opportunities in each of these areas. We anticipate that the eventual configuration of the West Africa GEOHealth Hub will include three or more of these five focal areas, although others may emerge from the needs assessment.

The University of Iowa has the requisite strengths in the core sciences that support the development of the proposed focal areas, including epidemiology, biostatistics, occupational and environmental health, environmental sciences, industrial hygiene, toxicology, behavioral sciences, and implementation science, along with specialized areas such as agricultural medicine, rural health, and disaster preparedness. Additionally, the University of Iowa has a number of research and research-training centers with relevant expertise and experience to support the development of this GEOHealth Hub.

The specific aims for this project are:

1. To contact all academic institutions, NGOs, and government agencies in the West African sub-region that have research activities and/or training programs related to occupational and environmental health to assess their potential for expanded regional collaborations.

2. To construct a database containing available information from each of the fifteen countries in the West African sub-region regarding:

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i. Environmental and occupational injuries and illnesses.

ii. Occupational and environmental health regulations and policies.

iii. Published research manuscripts and reports related to occupational and environmental health.

3. To convene a sub-regional consensus building workshop as the basis to further:

i. Organize the appropriate network of partners to address sub-regional needs.

ii. Refine the focal areas which are most in need of research and training.

iii. Identify activities for building research capacities in the selected focal areas.

The GEOHealth team (i.e. consortium leaders) had a lot of successful meetings within The Gambia and in the West African Sub-region. After the inauguration of the center at The University of The Gambia Faraba Banta Campus, the team wasted no time in meeting with internal spokes and developing survey tools for the needs and opportunities assessment. All these activities were well supported by University of Iowa through weekly project meetings.

Internally, we had successful meetings with CIAM, NEA, ChildFund, NAS, Directorates of Health Promotion; Planning; and Food Quality, Environmental Health Unit, University of The Gambia, Gambia College, Department of Water Resources, NARI, and MRC

Regarding contacts with external spokes, institutions and agencies like Health, Environment, academic and research centers were visited in Liberia, Sierra Leone, Guinea Bissau, Burkina Faso, Cape Verde Islands, Guinea Conakry, Mali, Senegal, Ivory Coast, Niger, and Nigeria. Adequate networks have been established and colleagues from the sub-region are currently sending in their responses.

It is important to note that, The Gambia GEOHealth team was joined by Prof. Fuortes from the University of Iowa when it visited WAHO Headquarters from June 14th to 18th. The team had a very successful meeting with WAHO and senior WAHO officials were very impressed with the project ideas and have made commitments to support the project realize its goals. This is manifested by the fact that we were invited to return to WAHO from July 15th to 17th to present the project to a team of Public Health experts on the harmonization of the medical public health curriculum for the West African Sub-region. This visit was partly funded by WAHO.

1.2 Consensus Building Workshop

This report presents the proceedings of the two days consensus building meeting that was held in Banjul, The Gambia from May 22nd to 23rd, 2014. Representatives came from Burkina Faso, Cape Verde Islands, Cote D'Ivoire, The Gambia, Guinea Bissau, Liberia, Mali, Nigeria, Senegal, and Sierra Leone. The GEOHealth team from both the University of Iowa of the United States, and University of The Gambia were also present. The West African Health Organization, the arm of ECOWAS, with the mandate to promote public health in the region was also represented. Country representatives came from diverse backgrounds including but not limited to, government agencies, research and academic institutions, non-governmental organizations, and the private sector.

It is also very important to state that the philosophy of the West African GEOHealth hub has been well received in the Sub-region to the extent that we had several self-funding delegates who decided to travel all the way to The Gambia just to participate in the workshop and contribute their ideas towards the development of occupational and environmental health in the ECOWAS Sub-region.

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Apologies were received from the Republic of Niger; Liberia, and Guinea Conakry.

2.0 Official Opening

2.1 Principal Investigator's Welcoming Remarks – Dr. Rex A. Kuye

After observation of the usual protocols, one of the Principal Investigators, Dr. Rex A. Kuye thanked all the delegates, whom he said without their individual and collective support, the sub-regional consensus building workshop would not have been possible. He went on to say “this prestigious grant was won by the University of The Gambia in partnership with the University of Iowa for the establishment of the West African GEOHealth Hub. The goal of the project is to address the needs for research, research training, and capacity building within the West African Sub-Region. It will focus on the most pressing rural health issues such as water quality, work place safety, agricultural health, toxic waste dumping, and disaster preparedness and response.” According to Dr. Kuye, to get this done in the West African Sub-Region, the GEOHealth team thought it fit to consult with colleagues in the region, and collate their responses in a database, following which, country representatives were invited to convene and formulate strategies for the establishment of the hub through consensus building. He concluded by saying that the overall goal of the workshop was to formally organized institutional network.

2.2 Principal Investigator’s Welcoming Remarks – Prof. Thomas M. Cook

Professor Cook went through the background of the project. He informed the delegates that one of the 23 institutions in the NIH is the Fogarty International Center; which is one of the ways that the NIH interacts with the rest of the world to improve global health. Sixteen (16) universities in the United States were tasked to work with their partner institutions abroad to identify research and capacity building needs around the world. The University of Iowa has been working with Central and Eastern Europe for over two decades now, in a program that includes getting health professionals from Eastern and Central European countries to come to the University of Iowa for either short, medium or long term training leading to degree programs. It was along the way that The Gambia was included in the program and a couple of health professionals have been getting their training at the University of Iowa at various levels. The University of Iowa has a long history of working in occupational health especially agricultural health, and this is also the current focus of GEOHealth.

The Fogarty International Center is now focused on consolidating the 16 small grants to just 6 regional hubs. This means that Fogarty can now do more with a smaller number of centers that have a greater number of collaborators; and opportunities for research and research training in occupational and environmental health. He reiterated that the focus of GEOHealth is more on rural health with concentrations on water quality, workplace safety, pesticides, toxic waste dumping, and disaster preparedness and response. However, one of the expected outcomes of the needs and opportunities assessment survey is to find out other important topics that are not included above.

He went on further to state that the model for the West African Hub is perceived to have a complex network of partners within and without the West African region. The University of The Gambia in partnership with University of Iowa will be at the core of the hub and networked to resources and organizations within The Gambia that are involved in occupational and environmental health (internal spokes). The external spokes will include similar resources and organizations in the fourteen other ECOWAS member countries. All these resources and organizations will be linked to this hub and there is indeed something to be gained by the interaction of the various collaborators and resources.

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2.3 Principal Investigator’s Welcoming Remarks – Prof. Laurence Fuortes

In his deliberations, Prof. Fuortes commented that public health issues currently facing the world and the training priority needs are still evolving. But training within the region will have a higher turnover than training internationally. He went on further to say that there are existing structures for capacity building within the West African Sub-Region but we need to document and identify the skills that already exist in each country and within each domain. He emphasized that it is very important to establish a very strong network of experts in occupational and environmental health in the region and it will also be important for the participants to share with the GEOHealth team, policy documentation, research publications, regulations, and strategies that are related to occupational and environmental health. Reviewing such documentation is a critical component of the needs and opportunities assessment.

2.4 Statement by WAHO representative – Mrs. Florence Awoyale

After observing the usual protocols, the representative of WAHO Director General to the GEOHealth Sub-Regional Consensus Building Workshop who also doubles as the Coordinator of the Young Professional Internship Program (YPIP), Madam Florence Awoyale, pressed WAHO’s commitment to this important sub-regional initiative. She went further to state that she has the mandate to tell the delegates that WAHO is ready and willing to cooperate with the Global Environmental and Occupational Health team for the benefit of all ECOWAS member countries. She went on to say that in June 2013, WAHO received the GEOHealth team in Bobo Dioulasso and after elaborate discussions, the organization saw the importance of the initiative and quickly aligned itself with the project objectives.

She assured that WAHO will continue to support the GEOHealth team in attaining its objectives in occupational and environmental health for the benefit of the health of the people of the ECOWAS region. WAHO looks forward to the areas of cooperation for the YPIP in occupational and environmental health because integration is the ultimate aim of the ECOWAS and this cannot be achieved without health. WAHO is therefore opened to all cooperation that will benefit the health of the region. In her closing remarks, she said that in networking in the ECOWAS region, WAHO will take the lead and this has started by WAHO already documenting best practices in the region so that all the countries can develop together. She emphasized that if GEOHealth is housed at the University of The Gambia, it is for the interest of the ECOWAS member countries. The GEOHealth team has covered 12 of the 15 countries and WAHO is happy with this, but not satisfied, because the remaining 3 countries still need to be covered and brought on board.

2.5 Opening Statement – UTG Vice Chancellor

The opening statement to the GEOHealth Sub-regional Consensus Building Workshop was made by the Provost of the School of Medicine & Allied Health Sciences of the University of The Gambia, Prof. Ousman Nyan, on behalf of the University of The Gambia’s Vice Chancellor, Prof. Muhammad M.O. Kah who was unavoidably absent. He opined that he has been following GEOHealth initiatives and that they are very much in line with activities currently prioritized by almost all the ECOWAS member countries. He reiterated that the activities have been focusing on stocking taking of occupational and environmental health needs and prioritizing the public challenges with the most pressing needs. The main task that is ahead now is not only networking within and beyond the ECOWAS region, but also to conclude this meeting with a good report that itemize the priority health needs and to come up with a consensus that will meet the needs of the people of West African sub-region. He reminded the gathering that in prioritizing, not everything can be done, but once a consensus is reached on the most pressing priorities, we should endeavor to optimize ways of addressing them.

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1.0 Proceedings for Day I

1.1 WAHO-YPIP

Ms. Florence Awoyale from the Division of Human Resources Development of WAHO, presented the background and functions of the Young Professionals Internship Program (YPIP). She informed participants that this program developed as a USAID and WAHO collaboration, and was initially funded by USAID to address the reality that ECOWAS Regional institutions lacked capacity to develop and maintain skills in Public Health. The overall aim of the program is to address brain drain and as well as work on the language barriers within the ECOWAS region. USAID and WAHO recognize the problems of unbalanced skills and language barriers that are impeding regional integration. The initial phases in terms of funding were the USAID AWARE 1 & AWARE 2 projects. Currently however, YPIP is entirely funded by ECOWAS, and the parent institution is WAHO. She went on by stating that WAHO coordinates its activities at all levels with World Health Organization (African Region) in Brazzaville.

WAHO has worked towards the harmonization of curricula in different domains – medicine, pharmacy, nursing/midwifery and Allied Health Professions. Public Health is classified as an Allied health Profession by WAHO. However, they have integrated public health training, epidemiology, information technologies, management skills and a second language into the YPIP training.

One hundred and eleven (111) YIP interns have graduated over 10 yrs. WAHO advertises and recruits regionally for the YPIP and attempts to select one applicant per country for a total of up to 15 trainees yearly. Based on demand and for some years, certain countries tend to have more representation than others. The programs are advertised in June and there is a standing selection committee with representation from the ECOWAS member countries. Applications are done on the internet and evaluated in 3 stages. Three (3) letters of recommendation are required which include one from a school or training program and one from an employer. In addition to regional balance, WAHO strives for and is committed to gender balance.

A medical degree is not a prerequisite for the YPIP. YPIP is a 12 month training program, the first 6 months are conducted in Bobo-Dioulasso with an intensive course work in Public Health Training, Leadership, Governance, Information and Communication Technology, ICT, and a second language. This is followed by 6 months of field training or internship in areas of interest or expertise of the trainees in non-origin countries in a 2nd language. Currently, Environmental and Occupational concerns are not on the list of Allied health domains but WAHO’s Director has expressed interest in integrating training opportunities in the region with the GEOHealth program. Other professional capacity building domains WAHO has done some work are in medicine, surgery, pharmacy, and allied health.

Based on the expression of interest from trainees as well as host and participating countries for the certification of participants by academic institutions, WAHO is in the process of regionalizing training locations for the YPIP to include academic centers in Benin, Ghana, and Cape Verde for French, English and Portuguese respectively.

Integration of curricula, resources and professionals for the good of the region is the “ultimate aim of ECOWAS”. WAHO is documenting “Best Practices in the Region” and has an existing network of stakeholders and partners in each ECOWAS country. Ms. Awoyale said that WAHO has offered to take the lead in coordinating networking with its partners, stating that “if GEOHealth is housed at UTG it is for the benefit of the 15 countries” following this statement with “We must bring the other 3 countries in”, i.e. Ghana, Togo, and Benin.

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Since the onset of YPIP and the USAID AWARE 1 & 2: Language barriers, insufficient technological capacity, lack of health science professionals, needs for special skills, management skills, and brain drain have been recognized as threats to the integration of health programs in the sub-region. Priority is given to applicants with Current & Guaranteed Job on Return and competencies are focused on Public Health, Computer & Info Management and Leadership. WAHO selects Trainers & Trainees in 3 stages: The basic criteria that must be met include, ECOWAS citizenship, 1 official language, acceptable academic performance, personal letter, 3 letters of recommendation, and previous professional experience.

The Young Professional Training Program normally trains young professionals with environmental health or medicine background in the following domains:

1. Primary Health Care
2. Prevention of blindness
3. Malaria
4. HIV/AIDS
5. Maternal and Child Health
6. Nutrition
7. Reproductive Health
8. Health Research

Candidates usually spend the first 20 weeks in didactic language training (a second language that is not an official language of the home country), then the next 20 weeks is spent on internship in a country and institution where the intern will use the foreign language as a working language. Towards the end of the one year training, the intern spends 3 weeks with the ministry of health, learning health care administration, and an additional 4 weeks in disease mapping and grant writing.

1.2 Country Reports/Presentations

Out of the 12 ECOWAS member countries visited and invited by the GEOHealth Project team, two countries – i.e. Niger and Guinea Conakry couldn’t make it to the sub-regional consensus building workshop. Each of the countries present made a 15 minutes presentation of major occupational and environmental health challenges and priority health problems that need to be addressed in their respective countries. Below is a summary of the country reports.

1.2.1 Senegal

The representative from Senegal was Dr. Thiam from Gaston Berger University in St. Louis. He reported that the emphasis for Senegal is to improve its collaboration with WAHO and other regional bodies in the fields of agriculture and health. He went on to say that there is no significant achievement at the policy level to improve agriculture and health. In terms of strategies to address this situation, there is a need to improve collaborations between governments and research centers within ECOWAS member countries. To narrow it further, he went on to report that the Senegalese country team has worked on improving and harmonizing the work of the faculty of agronomy and medicine to create a master's degree in Food and Nutrition Health. Beyond this endeavor, the team has created a multi-sectoral body that includes representatives from civil society and the Geography Department. The key areas of interest and priority are the mapping of local resources to improve nutrition security in Senegal, research in clinical nutrition, and research on the contamination of rice by pesticides. Challenges to these efforts are the improvement of the overall program management to sustain the initiative.

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1.2.2 Burkina Faso

The representative of Burkina Faso was Dr. Jeremi Rouamba from Centre MURAZ Research Center in Bobo-Dioulasso. Historically, this center has been focusing on Tropical Infectious Diseases but is now expanding to focus on broader public and environmental health issues that include: Injury Epidemiology, and air quality (in partnership with University of Oklahoma on atmospheric pollution).

Burkina Faso, is one of the landlocked countries with a source of the income that comes mainly from agriculture. The environmental and occupational situation in the country makes the population prone to challenges like meningitis, diarrhea, respiratory infections, and road traffic crashes. According to Dr. Rouamba, the following are high priority environmental and occupational health needs for Burkina Faso:

1. Surface water contamination
2. Outdoor air pollution
3. Human excreta
4. Solid waste
5. Deforestation and soil degradation
6. Disease vectors
7. Occupational risks in mining
8. Road Traffic injuries
9. Stress
10. Pesticide exposure and toxicity
11. Heavy metal exposure and toxicity

In terms of priority for occupational and environmental health training areas for Burkina Faso, the following are ranked high:

1. Epidemiology
2. Injury Epidemiology and Prevention
3. Agricultural Health
4. Environmental Toxicology
5. Health Systems Management
6. Health Policy
7. GIS
8. Analytical Laboratory
9. Grant Writing

1.2.3 Cape Verde

Dr. Januario Nascimento, Director of ADAD (an Environmental NGO) presented for Cape Verde. He outlined numerous challenges that his country is faced with in dealing with occupational and health issues. He indicated that in 1999, a Healthcare Charter for Cape Verde was developed. Other endeavors to address occupational and health issues...
environmental health in the country include the National Health Development Plan, which led to the ratification and signing of the Global Impact in 2013 that is aimed at creating an enabling environment for health partnership in line with priorities that are defined in the National Health Development Plan 2012-2015. This document also tries to harmonize development assistance by linking aid efficiency with resource mobilization to cover financing gaps.

Dr. Nascimento went on to discuss one of the environmental health best practices in Cape Verde Islands which emphasizes the control of plastic bags. The project encourages limited use of plastic bags and promotes the use of alternative materials such as paper bags.

### 1.2.4 Sierra Leone

Sierra Leone was represented by Dr. Bashiru M. Koroma, Dean of Community Health Sciences at Njala University. He described researches that have been done in his country on Agricultural Injury, surveys on serological and behavioral risk factors for Lasser fever (including an occupational health focus on the risk of Lassa transmission to health care workers) and a recent study on airborne Dioxin & Benzo-Furan exposures associated with solid waste sites and E-wastes.

Dr. Koroma described successes with the recruitment of community health workers, sanitarians and other public health workers into certificate programs. With reference to current occupational and environmental health challenges facing Sierra Leone, Dr. Koroma mentioned the increasing rate of rodent infestations in major urban centers, eye diseases, farm related injuries, and malaria especially during the rainy season. A major concern in the country presently is epidemic Lassa fever with about 300,000–500,000 cases annually, with approximately 5,000 deaths. There is evidence that zoonotic and fecal oral diseases are medical problems that must be tackled as environmental Health issues. He went on to state that the following will constitute priority health needs:

1. Human excreta (open defecation)
2. Drinking water pollution
3. Marine pollution
4. Indoor air pollution
5. Outdoor pollution by waste sites including dioxins, furans
6. Solid waste- plastic bags
7. Erosion – abandoned mining regions
8. Deforestation
9. Biodiversity loss
10. Disease vectors- mosquitoes, rats (Lassa fever) patients and healthcare workers
11. Floods
12. Food and drug safety
13. Poor hygiene and sanitation

In terms of occupational and environmental health needs, the following priorities were emphasized:

1. Injury epidemiology
2. Agricultural health
3. Grant writing
4. GIS

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5. Health education  
6. Data management  
7. Informatics  
8. Industrial hygiene  
9. Analytical laboratories  

He concluded by saying “Health policy is losing face. We have good policies; and we have to learn to implement them”.

### 1.2.5 The Gambia

The Gambia, as the host country, had more participants in the consensus building workshop than all the other participating countries. The country’s presentation was made by Mr. Momodou K. Cham of the Public Health Research Center (CIAM). Mr. Cham started by highlighting the country’s development challenges which he said are mainly factors such as inadequate social services and safety nets, natural and man-made disasters, and underdeveloped human resource base. He went on further to state that these challenges are due to the lack of or obsolete occupational and environmental health policies and regulations. However, all the occupational and environmental health challenges itemized were:

1. Solid waste (including e-waste and Clinical waste)  
2. Worsening Sanitation  
3. Water unavailability and Quality  
4. Global Warming/ Climate Change  
5. Deforestation/ Desertification  
6. Soil Erosion / Degradation  
7. Sea Level Rise  
8. Biodiversity Loss  
9. Road traffic crashes/accidents  
10. Agriculture related injuries and illnesses  
11. Microbiological & occupationally induced illnesses  
12. The rapidly growing informal sector  
13. Child labor, women workers, and labor intensive work  
14. Lack of National occupational health and safety policies and regulations.

In terms of occupational and environmental health priority needs, the following points were identified:

1. Proper management of solid waste (including plastics, Clinical wastes and electronic wastes)  
2. Initiation of toxicological studies of key environmental pollutants

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3. Updating and Enforcing Environmental Health related Acts
4. Setting up of pathology and Toxicology Laboratories
5. Strengthening of the chemical analysis Laboratory
6. Development of relevant policies & legislations
7. Development of an occupational health research agenda – responding to new challenges
8. Health & safety assessment to be included in the licensing of industrial establishments including commercial farms.
9. Creation of an enabling environment for access to relevant, up-to-date, information on work related accident risk reduction
10. Creation of a system for reporting work related accidents/injuries at all levels.

Mr. Cham concluded by stressing the need to improve research capacity for The Gambia with the view to promoting research for innovation, job creation, and the overall health of The Gambian population. This he said could be made possible by synchronizing existing research resources in country with the national public health research center. To this effect, he listed research opportunities in The Gambia as follows:

1. Existence of the Medical Research Center in The Gambia for decades
2. The pool of researchers in country
3. Facilities and staff of the Public Health Research Center (CIAM)
4. Facilities and staff of the University of The Gambia’s Science Technology and Innovation Park.

1.2.6 Mali

Mali was represented by Dr. Ousmane Toure of the National Institute of Public Health Research. Dr. Toure started by stating that Mali is a landlocked country and that one-third (\(\frac{1}{3}\)) of the land is uninhabited. This makes the extraction of ground water for domestic and industrial use very difficult. To this effect, the country heavily relies on surface water for drinking purposes, mainly from River Niger and River Senegal. In terms of occupational challenges, Mali is the 3rd producer of gold in Africa. Other minerals mined are iron, phosphate, and uranium. Pesticides and other agrochemicals still continue to affect the health of the population. There are often outbreaks of disasters especially from locust invasion. There are three major dams in the country and each of them is associated with vector breeding. He proceeded by listing occupational and environmental health hazards of the country as:

1. Disease vectors
2. Solid wastes
3. Deforestation
4. Drought
5. Surface water contamination
6. Toxic Wastes
7. Floods
8. Pesticides exposure and toxicity

He concluded that priority public health needs of the country are numerous but those that need urgent attention are solid waste, deforestation, and toxic waste.

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On priority capacity building needs, the following were emphasized by Dr. Toure.

1. Data management
2. Environmental toxicology
3. Health informatics
4. GIS
5. Analytical Lab techniques
6. Epidemiology
7. Agricultural Health
8. Industrial Hygiene
9. Biostatistics
10. Health Systems Management
11. Health impact assessment

Dr. Toure concluded by mentioning the resources that are available in Mali and could be of benefit to the region.

1. Animal Health Laboratory supported by the US Department of Agriculture to perform pesticide analyses.
2. Center for Epidemics, WHO Center

1.2.7 Nigeria

The country presentation for Nigeria was done by Mr. Augustine Ebesiki, Registrar of the Nigerian Environmental Health Council, and Dr. Henry Sawyer, Dean of Public Health at the Kwara State University. The Registrar started by looking at the country’s disease background of which infectious diseases still remain a major challenge. Among such diseases mentioned were Meningitis, Cholera, and Malaria. He went further to emphasize that so long as these and other similar diseases are not looked at from an environmental perspective rather than a medical perspective, the disease problems of West Africa will continue to affect our population. Other issues of occupational and environmental health concerns in Nigeria include weak enforcement of laws (especially occupational health), occupational injuries especially those that are farm related, and malnutrition during the hunger season.

In itemizing the challenges, Nigeria is currently faced with, the following were presented:

1. Waste management (poor technologies in landfills)
2. Food hygiene and safety
3. Sewage disposal
4. Hazardous waste including healthcare waste
5. Pollution control: used oil, lead and other metals
6. Surface and ground water contamination
7. Animal and human excreta
8. Outdoor pollution, indoor pollution, e-waste
9. Drought, soil degradation, and disease vectors

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For his part, Dr. Henry Sawyer spoke at length on the academic programs at his institution and other areas for collaboration. In complementing the list of occupational and environmental health challenges of Nigeria, he emphasized the same problems and went further to state that saline intrusion, marine pollution, toxic wastes (chemicals), and indoor air pollution, injuries (especially poisoning) are also of concern. On priority needs, he listed the following areas:

1. Biostatistics
2. Epidemiology
3. Injury Epidemiology
4. Industrial Hygiene
5. Environmental Toxicology
6. Health Systems Management
7. Health Policy
8. Health Education
9. GIS
10. Analytical Lab Techniques
11. Grant Writing
12. Social Assessment vulnerabilities

He concluded by listing opportunities that could be useful to the region – these are – an NGO he created in USA for donation of books, volunteers, equipment, and faculty and student exchanges.

1.2.8 Guinea Bissau

Guinea Bissau representative was Dr. Isis Julieta Pina Ferreira Gomes Ferreira from the Ministry of Health. She first presented the country’s background, and went further to report on the occupational and environmental health challenges of her country stressing that urbanization, is putting a lot of pressure on existing social amenities and is also contributing to poor housing conditions, scarcity of water in the urban centers, poor excreta management/open defecation, and poor wastes water management. Other public health challenges are water safety, poor management of waste (including clinical wastes), groundwater contamination, and the upsurge of disease vectors, air contamination, and pesticides poisoning. These among other factors could be responsible for the high incidence of respiratory diseases, cholera/diarrhea, parasitic, and cardiac diseases. These problems are compounded by lack of resources to implement the policy and strategic plan of the National Environmental Health and Public Hygiene, insufficient trained technicians in the area of environmental and occupational health, and outdated regulations in occupational and environmental health.

In terms of priority occupational and environmental health needs, the following concerns were raised by Dr. Gomes Ferreira:

1. Analysis and environmental health risk assessment
2. Development and adaptation of rules and regulations
3. Institutional Strengthening/capacity building for operational activities
4. Structuring of laboratory networks for surveillance, research and public health response
5. Expansion of an integrated environmental education program

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6. Creation of a database on the environmental risks

1.2.9 Côte D’ivoire

Dr. Stéphane Jean Claon of Universite Felix Houphouet-Boigny represented Côte D’ivoire. He reported that the major source of foreign exchange for the country is agriculture especially from cocoa, coffee, palm oil, rubber, and cotton. However, there are a lot of occupational and environmental health challenges associated with these produce. Other challenges are deteriorating ground water sources, solid waste management and the much talked about toxic waste that was dumped in the country some years ago. The said waste was dumped by a Dutch Chartered Ship registered in Panama - Probokoala and it was dumped in 13 waste sites in Abidjan. This waste contained phenols, NaOH, mercaptans, and H₂S. It caused 17 deaths and more than 43,000 illnesses were reported. The situation was propelled by noxious air quality issues and worsened by rain fall. Additional challenges are a growing urbanized population that is faced with water shortage, poor sanitation, inadequate housing, poor access to health care services, poor urban waste management, and air pollution.

In terms of priority health needs, the following were presented to the meeting:

1. Strengthening of Institutional framework through an integrated approach
2. Building capacity in environmental health monitoring on water and atmospheric related issues
3. Building a strong database to drive decision based approach by policy makers
4. Policy design and policy implementation in occupational and environmental health.

1.2.10 Liberia

Liberia was represented by Ms. Roseline Y.T. Chesson. She started by associating the current environmental situation with the state of health in her country. Liberia has a lot of diseases that are largely due to poor environmental health conditions and diseases such as acute respiratory infections, malaria and other preventable diseases are among the top ten causes of morbidity and mortality. The specific environmental health issues listed by Ms. Chesson were lack of a proper waste management system, improper excreta disposal options especially in the rural areas, the management of household trash, human feces, and hazardous medical wastes.

On the occupational health challenges, Ms. Chesson went on to state the following:

1. Lack of a comprehensive database to record, analyze and monitor occupational health accidents and disease trends.
2. Poor environmental safety conditions in workplaces that expose the workers to work-related accidents and/or disease conditions
3. Inadequate or lack of Occupational Health Safety Legislation and Regulations, hence the failure to enforce standards and to take punitive measures against unscrupulous employers who deliberately exploit the workers by subjecting them to health hazards
4. Lack of a focal professional in Occupational Health, and Occupational Health Education for the workers and Training for Service Providers
5. Inadequate or Lack of Occupational Health Preventive Programs such as Workers Wellness Programs.
The priority occupational and environmental health needs for Liberia includes but are not limited to:

1. Biostatistics
2. Epidemiology
3. Injury Epidemiology
4. Industrial Hygiene
5. Environmental Toxicology
6. Health Systems Management
7. Health Policy
8. Health Education
9. GIS
10. Analytic Lab Techniques
11. Grant Writing
12. Social Vulnerabilities Assessment

2.0 Proceedings for Day II
2.1 Group Work

There appeared to be a consensus on several issues. The prioritization of hazards from each of the countries had much in common with a few notable exceptions, Nigeria and all Francophone countries expressed particular concerns regarding mining and the oil and extractive industries. The participants were divided into two major groups - Anglophone and Francophone - to identify priority occupational and environmental health needs. The two Portuguese speaking countries (i.e. Cape Verde and Guinea Bissau) joined the Francophone group.

2.2 Anglophone

The Anglophone team prioritized the need for developing capacity to teach occupational and environmental health skill sets with developing a Public Health Toolbox as very essential. Biostatistics was identified as a major capacity gap in the region while some strengthening was identified for Epidemiology, GIS, and Toxicology. In terms of controlling specific environmental health challenges, the management of solid waste and improvement of water quality should be top priorities.

The team went further to strategize capacity building needs for the region. Didactic skill set development for specific technical areas coined as "train the trainer" is still a major need for the region. Mentorship and scholar exchange programs as well as long distance education were other strategies considered important for the region. To implement this, the team considered it important to develop a matrix of countries and their institutions as a way of skill set mapping.

The following needs were prioritized (list based on priority orders) by the Anglophone team:

1. Manpower
2. Skills
3. Capacity Building
4. Analytical Laboratory Techniques
5. Infrastructure

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2.3 Francophone

The Francophone team identified the following priority needs:
1. Food safety
2. Pesticides
3. Water quality
4. Mining safety
5. Waste management
6. Occupational Injuries
7. Air pollution

Based on the above needs, the following skill sets were identified to be important for the region:
1. GIS
2. Lab skills/Equipment
3. Epidemiology
4. Toxicology
5. Risk analysis/assessment
6. Governance/Management
7. Grant writing
8. Project management

2.4 Networks

A partial List of Existing Networks in the ECOWAS Region which could be partnered with are:
1. NEBRA-Network for Bioethics Inventory,
2. MRC – Research Network- Prof. Hassan Gaye - West African Network
3. MALARIAGEN
4. Genetic Epidemiology Network
5. Educational Networks
6. Demographics DHSI
7. Welcome Trust Grant
8. WANATAN – West African Network for AIDS, TB and Nutrition Funded by EU/EDCTP
9. CLTS – Community Led Total Sanitation Program
10. UNICEF
11. WHO AFRO Brazzaville

3.0 Way Forward

3.1 Use participants of the consensus building workshop as the Steering Committee for the West African GEOHealth Hub.
3.2 Develop a GEOHealth website to publish and share information.
3.3 Collect letter of support from each participant’s institution.

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### 4.0 Appendix – List of Participants

**PARTICIPANTS FOR THE GEOHealth CONSENSUS BUILDING WORKSHOP**

**MAY 22\textsuperscript{nd} – 23\textsuperscript{rd}, 2014**

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