

BIODIVERSITY DATA NEEDS FOR GHANA

A WORKSHOP REPORT



GBIF

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Foundation

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FORWARD

Prof. Alfred Oteng-Yeboah, Chair of Ghana National Biodiversity Committee

The Ghana National Biodiversity Committee provides technical advice to the government of Ghana through the Ministry of Environment, Science, Technology and Innovation. The advice is normally in reference to actions needed in Ghana on biodiversity and its contributions to ecosystem services for national development. These local actions are linked to global processes such as the 2020 Biodiversity Strategy and its Aichi 5 goals and 20 targets and the 2030 sustainable development goals.

Through its SWOT analysis, the workshop, among others, has brought to light data gaps and lack of public awareness, which have to be taken care of immediately. These areas need special focus. With documentation of data seen as a necessary step to appreciate the status of the Ghanaian biodiversity and ecosystem services, the workshop provided the opportunity to look into this as a useful knowledge gap and the need to fill these gaps.

The idea of education and awareness creation about biodiversity and its contributions to ecosystem services is a priority so that the Ghanaian populace would be adequately informed about the role biodiversity plays in national economy including the provision and sustenance of the ecosystem services which form part of it.

All said and done, when the strengths and opportunities in identifying the data needs of the national institutions are weighed against the weaknesses and threats accompanying these needs, one gets a glimpse or fair idea of hope that awaits Ghana. This hope is that complete knowledge will be built and Ghanaians will be educated about biodiversity and its role in ecosystems services, which promote human wellbeing. This achievement will contribute to the attainment of the 2020 global Biodiversity Strategy, the Aichi goals and targets and at the same time an understanding of the basic needs in the implementation of SDG 14 and 15 and the attainment of the 2063 Africa plan

It is interesting to note that the current Ghana Biodiversity Strategy and Action Plan takes these into consideration and makes references to them as targets. The outcome of this workshop should be discussed at the highest level of decision making to ensure that the appropriate actions are taken to promote the conservation and sustainable use of biodiversity in Ghana.

EXECUTIVE SUMMARY

This workshop was organized to arrive at a national consensus on biodiversity information needs for Ghana including identifying the gaps and challenges as well as strategies towards mobilization of data to address the information needs. The workshop was attended by 31 people from diverse background including academia, research institutions, government ministries and NGOs. This report on the workshop is divided into three sections. Section One of the report is about an introduction; Section Two is on the proceedings of the workshop while Section Three is on Appendices. The proceedings of the workshop is included a survey on biodiversity data holdings and needs for Ghana, and session on biodiversity data needs, gaps and opportunities for Ghana as well as prioritization of biodiversity data needs for Ghana. The workshop ended with recommendations for the way forward.

ACKNOWLEDGMENTS

This workshop is organized as a component of the “Capacity enhancement for the Ghana Node of GBIF” funded by the Global Biodiversity Information Facility under the Biodiversity for Development (GBIF-BID) programme with financial support from the European Union. The funding received from the GBIF-BID programme is acknowledged.

The workshop also benefited from the “Capture of Primary Biodiversity Data of West African Plants” project funded by the JRS Biodiversity Foundation in the USA. Thanks to the foundation for its continual support of biodiversity informatics in Ghana and largely Africa.

The University of Ghana is acknowledged for the time and salaries of staff on this project. The Ghana Node of GBIF is housed at the Department of Plant and Environmental Biology at the University of Ghana. This kind gesture of the department and the university at largely is highly recognized and acknowledged.

The organizers of this workshop would also like to thank the facilitators and moderators of the various session of this workshop. Without their support and commitment this workshop would not have been a success. They are particularly thankful to the Prof. Matilda Steiner-Asiedu and Prof. I. K. Asante for their opening remarks.

Thanks also to all the participants for their time and immense contributions at the workshop. The Erata Hotel is thanked for hosting this workshop.

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SECTION ONE

1.0. INTRODUCTION

Biodiversity is the variety of life on Earth, and it provides raw materials such as food, water, shelter and medicine for human well-being. Biodiversity also supports human systems through the provision of ecosystem services that maintain all natural and human systems. However, global biodiversity remains largely undiscovered and undescribed, and continue to be threatened by largely anthropogenic activities, and natural disasters.

Biodiversity information is important in making national policies regarding conservation and use of endemic and threatened taxa, protected areas as well as national requirements for international conventions such as the Clearing House mechanism (CHM) of the Convention on Biological Diversity (CBD). Effective management of natural resources is underpinned by rich information resources. Park managers need rich biodiversity information for management. Scientists, data managers and researchers require data to demonstrate new insights into species' geographic distributions, composition of local floras, complementarity among areas, foci of endemism, lists and maps of plants of economic importance, updated threatened species lists, and other products of interest to diverse stakeholders.

This workshop is an integral component of a two-year capacity enhancement project of the Ghana Node of the Global Biodiversity Information Facility (GhaBIF). The project seeks to build capacity of the Ghana node of GBIF (GhaBIF) and partners institutions across the country. A strategic plan for the node, which is a basic requirement for long-term effective delivery of any national biodiversity information institution, will be realized. Data needs and examples of data uses will be documented to demonstrate the enormous benefit to be derived from biodiversity data mobilization and sharing. The project will mobilize a sector of plant data that is complementary to the specimen-based data mobilized so far—that is, mobilize and share large amounts of sample-based plant occurrence data. The project will also initiate mobilization of large amounts of vertebrate data from Ghanaian institutions, which will be a first major step for vertebrate-oriented effort in West Africa! Consequently this project represents an important step towards fixing important biodiversity information gaps for Ghana.

The objective of this workshop was to arrive at a national consensus on biodiversity information needs for Ghana including identifying the gaps and challenges as well as strategies towards mobilization of data to address the information needs. As part of the workshop a questionnaire survey on biodiversity data-holdings and needs for Ghana was carried out. The workshop was organized into four major sessions, namely; (1) completing a survey questionnaire on biodiversity data-holdings and needs for Ghana, (ii) biodiversity data needs, gaps and opportunities for Ghana; (iii) prioritization of biodiversity data needs for Ghana, and (vi) strategies for the way forward.

SECTION TWO

2. 0. WORKSHOP PROCEEDINGS

2.1. Registration and Welcome

Registration for the workshop was scheduled between 8:00 am and 9:00 am. After the registration period, Prof. Alex Asase warmly welcomed participants and expressed gratitude for them honoring the invitation. Subsequently, participants introduced themselves, their institutions and use of biodiversity information.

2.2. Formal Opening Session

Before formal opening of the workshop, the Head of the Department of Plant and Environmental Biology at the University of Ghana, Prof. I.K. Asante, talked about the importance of biodiversity in our daily lives and for socio-economic development, and subsequently introduced the Dean of the School of Biological Sciences, University Ghana, Prof. Matilda Steiner-Asiedu who delivered the formal opening address for the workshop.

In her address, Prof. Matilda Steiner-Asiedu indicated the purpose for the workshop and encouraged participants to contribute towards making the workshop a success. She highlighted the significance of biodiversity data in various sectors of development including tourism, academia, research, and national development. Prof. Steiner-Asiedu in her concluding remarks emphasized the importance of data for attainment of the Sustainability Development Goals (SDGs).



Fig.1: Prof. Matilda Steiner-Asiedu delivering the opening address at the workshop

2.3. Survey on Biodiversity Data-Holdings and Needs for Ghana

This objective of this session of the workshop was to assist participants to complete a questionnaire survey on biodiversity data-holdings and needs for Ghana (Appendix 2). Mrs. Gladys O. Schwinger facilitated this session. She provided clarifications and assisted participants at the workshop to complete questionnaire. The results of the analyses from the completed questionnaire will provide further insights about biodiversity data and information needs for Ghana.



Fig. 2: Mrs. Gladys Schwinger facilitating the session on questionnaire survey

2. 4: Biodiversity data needs, gaps and opportunities for Ghana

This session involved participants brainstorming on biodiversity information needs for Ghana including data gaps and opportunities for various institutions, organizations and individual work. It involved workshop participants working in three parallel sessions, namely, (1) academic and research group; (2) policy and governance; and (3) Non-Governmental Organizations (NGOs), Community-Based Organizations (CBOs) and other stakeholders.

Prof. G. Ameka of the Department Plant and Environmental Biology, University of Ghana moderated the session on academic and research institutions. The participants in this group were drawn from universities and research institutions dealing with biodiversity.

This group brainstormed on biodiversity data needs, gaps and opportunities for teaching and research. The group on policy and governance moderated by Dr. Ted Y. Annang of the Institute of Environment and Sanitation Studies at the University of Ghana and Prof. Alfred Oteng-Yeboah, Chairman of the National Biodiversity Committee. They were made up of participants from the ministries and public institutions across the country. The group discussed biodiversity information needs for national policy and governance and regulatory issues.

The last group was made NGOs, CBOs and other biodiversity stakeholders and was moderated by Dr. D.E.H. Owusu of the Department of Animal Biology and Conservation Science, University of Ghana. This group discussed biodiversity information needs as well as the role of NGOs and CBOs in data mobilization.



Fig. 3: Discussion at the three parallel sessions of (a) academic and research; (b) policy and governance group; and (c) NGOs, CBOs and other stakeholders.

2.5. Prioritization of Biodiversity Information Needs for Ghana

This session involved presentations from the three parallel sessions and was chaired by Prof. G. K. Ameka of the Department Plant and Environmental Biology at University of Ghana. Each of the three parallel sessions had the opportunity to present their views for further deliberations. Dr. Alex Anning of the Department of Theoretical and Applied Biology at the Kwame Nkrumah University of Science and Technology presented on behalf of the academic and research group while Mr. Eric Opoku Mensah of the Department of Crop Science, University of Ghana made the presentation for the NGO, CBO and other stakeholder group. Mr. Bismark Kwesi Asitoakor of the Department of Crop Science at the University of Ghana presented on behalf of the policy and governance group. After extensive discussions and comments on the presentations, participants were able to preform a SWOT analysis on biodiversity data needs, gaps and opportunities for Ghana (Table **).

Table **: SWOT analyses of the presentations on biodiversity data needs, gaps and opportunities for Ghana

Strengths <ol style="list-style-type: none"> 1. Existence of NGOs, CBOs, and other stakeholders that has biodiversity data for Ghana. 2. Existence of state and private institutions, that keep biodiversity data in the country 3. Existence of legal frameworks pertaining to biodiversity data usage and management. 4. Several ongoing biodiversity researches in the universities and various institutions in the country. 5. Availability of technical expertise in biodiversity in the country. 6. The existence of good quality data on biodiversity in the country. 7. Ghana is a signatory to a number of biodiversity-related conventions (CBD, SDG). 	Weaknesses <ol style="list-style-type: none"> 1. Inadequate and up-to-date biodiversity inventory data in the country 2. Lack of a focal point for biodiversity data in the country. 3. The inability to prioritize biodiversity data needs. 4. Inadequate taxonomists and lack of interest in taxonomy. 5. Weak institutional linkages and coordination. 6. Lack of motivation to share data. 7. Non-standardization of data. 8. Lack of tools to authenticate biodiversity data. 9. Less public education on biodiversity. 10. Inadequate funds for acquisition of biodiversity data.
Opportunities <ol style="list-style-type: none"> 1. Possibility of upgrading the National Biodiversity Committee to a Commission 2. Opportunity to train taxonomists in the country. 3. Willingness of key stakeholders to train and build capacity for biodiversity data acquisition. 4. Data existence in various institutions 5. Availability of data online 6. Good participation of stakeholders in biodiversity conservation meetings and activities. 7. Avenue for job creation 8. Biodiversity information can be used for advocacy 9. Opportunity to establish biodiversity working groups 10. Opportunities for training available through biodiversity informatics initiatives such as GBIF, JRS Biodiversity Foundation. 	Threats <ol style="list-style-type: none"> 1. Unwillingness of biodiversity data holding institutions to share data. 2. Over protection of biodiversity data 3. Lack of concern on high exploitation levels of natural resources.



Fig. 4: Prof. G. Ameka sorting out points towards SWOT analysis

The participants also identified the following biodiversity data needs as priority areas for future investments.

- Up-to-date biodiversity inventory data especially for protected areas such as nature reserves and conservation sites.
- Spatial distribution data on biodiversity particularly under land-use and climate change scenarios.
- A National Red List of biodiversity for major groups such as plants, mammals, birds and insects.
- Data on pathogens and microbes, and their effects on economic crops and livestock.
- Annual data on harvested biodiversity particularly timber and non-timber forest products (NTFPs) such as bush meat.
- Data on economically useful biodiversity groups such as medicinal plants and timber species.
- Data on Invasive Alien Species (IAS); their presence and distribution.

To address the biodiversity information needs for Ghana, the participants also identified the following as paramount.

1. The establishment of a central hub for biodiversity information in Ghana to aid data acquisition, storage, sharing and use. Such a unit must be well resourced and supported financially to become sustainable.
2. Training and capacity enhancement of human resources in the taxonomy, and collection and management of biodiversity data.
3. Mobilization and standardization of existing data on biodiversity following data standards such as Darwin Core for sharing and re-use.
4. Funding and resource support for biodiversity research and data management.

2.6. The Way Forward

Prof. A. A. Oteng-Yeboah, chairman of the National Biodiversity Committee, was the moderator for this session. He began the session by reflecting on the state of knowledge and the current status of biodiversity in Ghana. He stressed the need for a more holistic approach to looking at issues affecting biodiversity conservation in the country such as the recent galamsay menace on biodiversity. After extensive deliberations participants arrived at the following recommendations with regard to long-term sustainability of biodiversity in Ghana.

- Education and awareness creation about Ghanaian biodiversity.

- Establishment of a National Biodiversity Commission for regulation and management of biodiversity in Ghana.
- Establishment and management of a national centralized database on biodiversity.
- Good planning, monitoring and evaluation of biodiversity at national and institutional levels.
- The incorporation of topics on biodiversity in earlier educational curriculum.
- Introduction of Biodiversity Sustainability Concepts and Urban Ecology in higher National Educational Curriculum.
- Provision of alternative resource sources to avoid biodiversity depletion.
- The use of science and technological approach
- Data sharing and coordination amongst institutions
- The need for Government support for universities toward training students in taxonomy and biodiversity conservation
- Involvement of National Biodiversity Committee in major natural resource utilization decisions
- Organization of annual fora involving various stakeholders in the biodiversity sector to regularly and continuously deliberate on issues pertaining to biodiversity conservation at the national level.

2.7. Closing of workshop

Prof. Alex Asase moderated this final session of the workshop. He thanked participants for making time to attend the workshop and for their contributions. He also acknowledge the sources of funding for this workshop particularly, Global Biodiversity Information Facility-Biodiversity for Development (GBIF-BID) programme, JRS Biodiversity Foundation and the University of Ghana. He further indicated a training workshop on data capture would be organized soon, which will extend invitations to participants.

SECTION THREE

3.0 APPENDICES

Appendix 1: Agenda for workshop

Time	Activities
8:00am – 9:00am	Arrival and Registration
9:00am – 9:10am	Introductions and Welcome (Prof. Alex Asase / Workshop Participants)
9:10am – 9:25am	Opening Remarks Prof. I.K. Asante (HOD, Department of Plant and Environmental Biology) Prof. Matilda Steiner-Asiedu (Dean, School of Biological Sciences, University)
9:25am – 9:40am	Tea / Coffee / Cocoa Break
9:40am – 10:25am	Survey on Biodiversity Data-Holdings and Needs for Ghana Facilitators: Mrs. Gladys O. Schwinger & Mr. Bismark K. Asitoakor Participants complete Questionnaire
10:30am – 12:30pm	Biodiversity Data Requirements, Gaps and Opportunities for Ghana Three Parallel Sessions; (1) Academia and Research (Moderator Prof. Gabriel Ameka) (2) Policy and Governance (Moderator Dr. Ted Y. Annag) (3) NGOs, CBOs and Other Stakeholders (Moderator: Dr. Erasmus H. Owusu)
12:30pm – 13:30pm	Lunch Break
13:30pm – 14:30pm	Prioritization of Biodiversity Data Needs for Ghana (Moderator: Prof. Gabriel K. Ameka) Presentation from parallel sessions and synthesis of major points
14:30pm – 15:30pm	Way Forward (Moderators: Prof. A.A. Oteng-Yeboah) Discussion on next steps regarding biodiversity information for Ghana
15:30pm – 16:00pm	Closing (Moderator: Prof. Alex Asase)



SURVEY OF BIODIVERSITY DATA-HOLDINGS AND BIODIVERSITY DATA NEEDS FOR GHANA

BACKGROUND

This survey is an integral component of a two-year capacity building project of the Ghana Node of the Global Biodiversity Information Facility (GhaBIF). The project seeks to build capacity of GhaBIF and partners institutions across the Ghana. The Global Biodiversity Information Facility (GBIF) is an international open data infrastructure, funded by governments around the world with the vision “a world in which biodiversity information is freely and universally available for science, society and a sustainable future” (www.gbif.org).

The project is supported by the European Union under the Biodiversity Information for Development programme (<http://www.gbif.org/programme/bid>). The survey consists of two major parts, namely; (a) survey of biodiversity data holding institutions; and (b) survey of biodiversity data needs. The results of the survey will be validated at a stakeholder’s workshop to be organized. Biodiversity data gaps to be identified and strategies on how to address the data gaps as well as enhancement of digitization and sharing of biodiversity data in Ghana will be discussed at the workshop.

First, kindly provide details about your organization in Part A and then proceed to complete the rest of the survey. It is recognized that some institutions are both data holders/ providers and users at the same time, and therefore they have to complete both Part B and Part C of the survey. Some other biodiversity organizations are largely data users and they will be required to complete only Part C of the survey.

PART A: ABOUT YOUR ORGANIZATION

Name and position of person completing questionnaire	
Name of Organization	
Physical address	
Email / Telephone	
Type of institution (please underline as many as relevant)	Government; NGO; University; Research Institution; Private Organization; Other
Type of biodiversity institution (please underline as many as relevant)	Data holder; Data user; Both
Which of the following is your organization involved in (please underline as many as relevant)	Legal and Policy; Conservation; Research Capacity Building; Environmental Management; Ecotourism; Public education

Which of the following biodiversity groups is the work of your organization most concerned (please underline as many as relevant)	Plants; Fungi; Algae; Mammals; Birds; Insects; Reptiles and Amphibians; Microorganisms
Which ecosystem types is your organization most concerned with (please underline as many as relevant)	Terrestrial; Marine; Freshwater

PART B: BIODIVERSITY DATA-HOLDING INSTITUTIONS

The aim of this part of the survey is to capture data on biodiversity information providers or data holding institutions, status of digitization of their data as well as publication of the data. Biodiversity data includes data on biological collections or natural history collections in herbaria and museums, sample-based data from plots and biodiversity inventories, and observational data including citizen science data. Digitization means digital capture of data in the form of images, sounds and alphanumeric. Publication refers to biodiversity data that is openly available online and freely accessible. Kindly read through and complete all five sections of the questionnaire.

1. Strategy for Mobilization Data	YES	NO
Do you have biological collections?		
If you answered yes to the above, Is there a purpose for your collection?		
Is there a purpose for the mobilization of biodiversity data?		
Have the scope and extent of digitization been defined?		
Has your curator assessed any necessary pre-digitization activities – sorting of samples, taxonomic reviews, cross checking with field notebooks etc.?		
Does your institution have defined data policy that covers issues like intellectual property rights, custodial responsibilities, access, liability and privacy etc.		
Do you have a database management system selected?		
Would you want to add anything:		

2. Digitization Landscape	YES	NO
Have you set up a digitization workspace?		
What proportion of your collection has been digitized?		
Has pre-digitization curation been carried out?		
Have the digitization processes and technologies been defined?		
Have the workflows been well defined?		
Are your staff adequately trained and equipped?		
Have quality control and standards been clearly specified?		
What database platform do you in digitization (e.g. BRAHMS, Microsoft Excel)		
What formats are your digital data stored?		

What proportion of your biological collections / data has been digitized?		
What are your challenges in digitization?		
Would you want to clarify anything:		

3. Data Publication	YES	NO
Have the needs of end users and web publishing been fully considered in the selection of data formats?		
Has a (web) data –publishing tool been selected and set up?		
Has data licensing option been selected and supported by GBIF		
Does your institution have access to stable Internet supply?		
What online platforms have you used or will use to share data (e.g. GBIF online)		
What are your challenges in publication of data?		

4. Preservation and Archiving		
Does your institution have access to suitable long-term data archival repositories?	YES	NO
Can your institution safeguard against obsolescence of data formats and applications?		
Would you want to add anything:		

Thank you.

You have finished with part B of the survey. Kindly proceed to Part C of the survey.