

Expanding the visibility of the Lagos Herbarium through Digitization and Mobilization of Plant Specimen Data

Programme: BID

Project ID: BID-AF2020-009-INS

Project lead organization: Department of Botany University of Lagos

Project implementation period: 5/4/2021 - 30/12/2022

Report approved: 16/2/2023

Final Narrative Report

Executive Summary

With the aim to digitize and publish information from preserved vascular plant collections as well as associated metadata and images at the Lagos University Herbarium (LUH) for conservation assessments, policy making and stakeholder use; the project began with an inception meeting of project partners and relevant institutional stakeholders to kick-off the project and work out modalities for its successful implementation. This was earnestly followed by the design of a project workflow (see attachment) and recruitment/appointment of personnel for the onward execution of the project (see attachment). Relevant equipment and consumables for the project were also purchased.

Curation of the voucher specimen was done followed by the digitization of the specimen using HD Camera. Then data mobilization began using Microsoft excel spreadsheet and the Darwin Core format for recording data about the specimen. A total of 10,741 occurrence data and 4,298 checklist data were mobilized. These were subjected to cleaning using Open Refine and the cleaned data were published through the GBIF Integrated Publishing tool kit (see <https://www.gbif.org/project/BID-AF2020-009-INS/expanding-the-visibility-of-the-lagos-herbarium-through-digitization-and-mobilization-of-plant-specimen-data#datasets>). Also, an electronic identification key was developed for species identification in the herbarium. This uses a single license key LUCID software which was purchased for the project (http://science.unilag.edu.ng/botany/Monocots_player.html)

An engagement meeting of stakeholders including data holders within Lagos state, students, policy makers and researchers was held in January 2022, to sensitize them about the project. The meeting held in blended mode and a total of 31 physical participants as well as 20 virtual participants were in attendance (see attachment). As a result of the engagement meeting, the Lagos state Ministry of the Environment and Water resources partnered with the project team in February 2022 and a capacity building training was organized for its members of staff. A total of 15 members were trained on Mobilization of biodiversity data and its implications for policy makers (<https://www.gbif.org/event/dec89d-5af1-43af-adcc-d19dee4/capacity-building-training-on-biodiversity-digitization-for-staff-of-conservation-and-ecology-department>).

Similarly, the project held a 3-days capacity building workshop on the applications of the digitized biodiversity data for conservationists and policy makers from 28th to 30th of June, 2022 at the Research management office Boardroom, University of Lagos, Akoka, Lagos (<https://unilag.edu.ng/?p=13422>). A total of Forty-four (44) participants including undergraduate (4) and postgraduate (11) students, researchers (11), conservations (2), academics (12) and policy makers (4) from twelve (12) institutions across Lagos state, Kwara and Africa. Participating institutions include: University of Lagos (UNILAG), Lagos state University (LASU), Lagos State Ministry of Environment & Water Resources, Lagos State Parks and Gardens Agency (LASPARK), Dreamscape Resources, LBJA Conservation, Nigeria Natural Medicine Development Agency (NNMDA), Federal Institute of Industrial Research Oshodi (FIIRO), Local Government Service Commission, Forestry Research Institute Nigeria (FRIN), University of Ilorin and University of Sierra Leone (<https://theconscienceng.com/biodiversity-data/>; <https://unilag.edu.ng/?p=13422>; <https://drive.google.com/drive/folders/1FBV9pX29AVtz2VRqvdtdxMmTH1V5Z07?usp=sharing>; <https://punchng.com/group-calls-for-digitisation-of-specimen-data/>).

Again, the project organized a webinar to share experiences of key lesson learnt and challenges faced in the project. A total of 47 participants were in attendance and the recordings was publicized through the University's website and YouTube (<https://unilag.edu.ng/?p=14500>; <https://youtu.be/d3cl2fAisWM>). A research article was published on diversity and use of plant collections in the Lagos University Herbarium. Also a data paper on the project is being compiled (see attachment).

Finally, to evaluate the project, an end of project stakeholder's meeting was held where the project achievements and impact were highlighted and a policy brief was shared based on the project outcomes.

Key Achievements

- The project trained a total of 59 individuals on Digitization, Mobilization and Applications of Plant specimen data for policy making and conservation.
- A total of 15,039 plant specimen data were mobilized.
- A research article on useful plants in Lagos herbarium was published.
- A policy brief was developed for conservation of plant diversity in Lagos state
- A user friendly electronic identification access key – (LUCID) was deployed for ease of identification of species.
- A guide to plant digitization and mobilization techniques was produced through the webinar and deposited on youtube.

Key Impact

- Foster data sharing and collaboration amongst stakeholders for effective assessment of biodiversity data in Lagos.
- Improved access to and use of accurate biodiversity information in conservation and development planning.
- Provide insight into spatio-temporal distribution of plant species for improved conservation schemes
- Enhanced visibility and open access to the Lagos University Herbarium
- Increased capacity in biodiversity informatics and data handling.

Key Lessons Learnt and best practices identified

- Based on collection sites, it was observed that many sites, where samples were collected years ago have, undergone significant changes.
- The areas have been converted, from natural green spaces to the built-up area.
- In these cleared areas no species were found there anymore.
- In some locations, the population size of species found in recent times has reduced significantly because part of the area has been cleared for developmental purpose.

In view of the foregoing, the following were recommended:

- Review and updating of extant regulations & guidelines in the State to adequately address the protection of the flora and fauna of Lagos State based on current research evidence.
- Inventory of the flora and fauna of Lagos in digitized format is key to measuring the level of decline and the development of strategies to reverse the environmental degradation and loss of biodiversity.
- The Stakeholder Advocacy Campaign should be intensified to encourage the wise use of wetlands and forested areas to ensure its sustainability.
- Encourage Public Private and institutional Partnership in implementing conservation targets that will reduce Biodiversity loss and promote sustainability. This will also help address threats to ecological character of green spaces.

A major challenge we experienced concerns the disbursement of funds and this was occasioned by the change of our institution's accounting details. We were however able to resolve this without having a significant impact on our project deliverables. Again, we quickly found out once the project started that we didn't have as much checklist data as we estimated to mobilize in our proposal hence the shortfall recorded. We therefore have no other post project activity.

Progress against milestones

Has your project completed all planned activities?: Yes

Has your project produced all deliverables: Yes

Report on Activities

Summary of the implementation of the project activities

Project Inception meeting was held in May 2021 where partners and other stakeholders within the institution met and agreed on modalities useful for achieving the set goals for the project. Following the inception meeting, partners agreed to adopt the Microsoft excel package as **Data management system** for cataloguing of specimen in the Lagos Herbarium for easy access, sorting and

management.

Stakeholders engagement meeting was held in January 2022 rather than August as earlier planned due to conflicting programmes within the University. Stakeholders buy-in was established and relationships with decision-makers and government ministries was strengthened to develop data sharing framework and build capacity in plant biodiversity data mobilization within the state.

Data Mobilization activities began in May after an initial training of personnel (IT students, MSC and Technical assistants) employed to assist with the project activities. Essentially taxonomic, spatial, collection and descriptive data were mobilized from each of the voucher specimen and other literatures within the LUH. Darwin Core format was used for data gathering and both occurrence and checklist datasets were mobilized. About 15,000 datasets were mobilized.

Data Cleaning was done using the Open Refine software and datasets were validated using the GBIF validator before publishing was done.

Data Publishing was achieved using the GBIF Integrated Publishing Toolkit (IPT). This was done at regular intervals as soon as data mobilization and cleaning were completed. About 15,000 datasets were published through the platform.

Imaging of specimen was delayed due to our inability to get a scanner within the budgeted cost. In view of this, a High Definition Camera with corresponding accessories was purchased to achieve the imaging of the specimens. Once Purchased, digitization began with curation and sorting of specimens for data capture and imaging. A total of 8,092 specimens were digitized and images were stored on a google drive and eventually published through the GBIF portal.

Capacity building workshop: One of the project partners – Dr. Aramide Igbari was nominated to participate in all the 3 workshops organized by GBIF secretariat and she was awarded a certificate and badge accordingly.

With respect to the project itself, the planned workshop for the project took place 28th-30th June 2022 due to the strike action in the University. However, two workshops held within the project, a 2-day workshop for Lagos State Ministry of Environment Officials (15 people attended) in February and a 3-day workshop for Conservationists and Policy Makers (44 people participated) in June. In all, capacity was built in digitization, mobilization and use of biodiversity data for undergraduate (4) and postgraduate (11) students, researchers (11), conservations (2), academics (12) and policy makers (19). Participants were from twelve (12) institutions across Lagos state, a few participants attended from Oyo and Kwara states in Nigeria. Modules delivered at the workshops include: Introduction to GBIF, The Project, Data Types and Data Capture, Darwin Core format, Data Mobilization and Planning, Data Cleaning and Publishing Tools, IUCN red-listing of Species and Species Distribution Modelling. (Evidence attached).

Progress made in the project was **evaluated and monitored** through regular meeting where updates are given on the progress of the project. Also, feedback assessment forms were issued to participants and stakeholders in the project to monitor our actions and ensure improvements as necessary.

License for **development of an electronic key** was purchased in February and has been deployed for easy identification of plants by populace.

A webinar was organized to share lessons learnt on the project and a total of 47 participants were in attendance (evidence attached below).

An End of Project **stakeholders meeting** held in December to share the outcomes of the project with relevant stakeholders and get feedbacks on their experiences working with us on the project. A total of 35 stakeholders attended and the feedbacks given were noted. A policy brief was developed and presented to stakeholders for further input. (See attached)

Project Reporting: The progress of work done in the project was reported to the GBIF office at midterm and the end as required.

Completed activities

Activity: Project Inception Meeting

Description: Project inception meeting with project partners and other stakeholders to establish agreements on project implementation and data sharing as well as training of team members.

Start Date - End Date: 18/5/2021 - 19/5/2021

Verification Sources: See attachment

Activity: Mobilization of Data

Description: Sort, validate, and make the specimens available for data registration and photography

Start Date - End Date: 1/6/2021 - 29/7/2022

Verification Sources: See attached

Activity: Stakeholders Meeting

Description: Effective network amongst stakeholders. This is to be able to maintain contact and coordination with participating partners to ensure the activities are in-line with the collaborative scheme

Start Date - End Date: 13/1/2022 - 13/1/2022

Verification Sources: See attached.

<https://unilag.edu.ng/?p=11701>

Activity: Digitization of Specimens

Description: Imaging of specimen sheets, Publication of images and linking of digitized records of plants to herbarium samples.

Start Date - End Date: 23/5/2022 - 25/11/2022

Verification Sources: <https://drive.google.com/drive/folders/1lvvDUiaI9s3gVBZBEKA-CUaXcTNA1eXQ?usp=sharing>

https://drive.google.com/drive/folders/1RWaR_7BnWT2r8T8bHfCrudMJzi85xDSv?usp=sharing

<https://drive.google.com/drive/folders/1wiJHJBtXUKQFJ0tbFcG2onv5HtJXJrI7?usp=sharing>

<https://drive.google.com/drive/folders/1gINzNuWc1bCHAiecAdlcZF8WbrGpYnIO>

Activity: Data Publication

Description: Registration and upload of geo-referenced plant collection data to GBIF through IPT.

Start Date - End Date: 15/6/2021 - 27/12/2022

Verification Sources: <https://www.gbif.org/project/BID-AF2020-009-INS/expanding-the-visibility-of-the-lagos-herbarium-through-digitization-and-mobilization-of-plant-specimen-data#datasets>

Activity: Workshop

Description: A 2-day workshop for Lagos State Ministry of Environment Officials

Start Date - End Date: 23/2/2022 - 24/2/2022

Verification Sources: https://www.linkedin.com/posts/temitope-onuminya-a15185a8_training-environmentaleducation-gbif-activity-6904549023228014592-3RPB?utm_source=share&utm_medium=member_desktop

https://www.linkedin.com/posts/temitope-onuminya-a15185a8_training-environmentaleducation-gbif-activity-6904549023228014592-3RPB?utm_source=share&utm_medium=member_desktop

Activity: Workshop

Description: A 3-day Capacity Workshop for conservationists and Policy makers

Start Date - End Date: 28/6/2022 - 30/6/2022

Verification Sources: <https://unilag.edu.ng/?p=13422>;

<https://theconscienceng.com/biodiversity-data/>

<https://punchng.com/group-calls-for-digitisation-of-specimen-data/>

Activity: Webinar

Description: A webinar to share lessons learnt and outcomes of project.

Start Date - End Date: 12/10/2022 - 12/10/2022

Verification Sources: <https://unilag.edu.ng/?p=14500>;

<https://youtu.be/d3cl2fAisWM>

Activity: Evaluation and Monitoring

Description: Submission of progress reports to GBIF at specified intervals

Start Date - End Date: 31/12/2022 - 30/12/2022

Verification Sources: <https://www.gbif.org/project/BID-AF2020-009-INS/expanding-the-visibility-of-the-lagos-herbarium-through-digitization-and-mobilization-of-plant-specimen-data#about>

Activity: Development of Electronic Access Key

Description: An open access electronic key is developed for identification of specimens at the LUH

Start Date - End Date: 2/5/2022 - 30/11/2022

Verification Sources: http://science.unilag.edu.ng/botany/Monocots_player.html

Activity: Stakeholders Meeting

Description: End of project meeting with stakeholders to assess the success of the project and implications of data obtained for conservation and policy making.

Start Date - End Date: 22/12/2022 - 22/12/2022

Verification Sources: <https://unilag.edu.ng/?p=17638>, <https://lnkd.in/dgC8dS4A>

Activity: End of Project Reporting

Description: Submission of end of project report to GBIF

Start Date - End Date: 30/12/2022 - 30/12/2022

Verification Sources: <https://gbif.fluxx.io/dashboard/index>

Report on Deliverables

Deliverables - Summary

Datasets: A total of 15,039 datasets comprising 10,741 occurrence data and 4,298 checklist data have been mobilized through this project. Of these, 8785 occurrence and 3187 checklist data were from the University of Lagos Herbarium while the remaining were from other stakeholders who participated in the project.

Webinar: A webinar was organized to share the learning outcomes from the project and a total of 47 participants were in attendance (evidence attached below).

Workshop: Two Workshops held within the project, a 2-day workshop for Lagos State Ministry of Environment Officials (15 people attended) and a 3-day workshop for Conservationists and Policy Makers (44 people participated). In all, capacity was built in digitization, mobilization and use of biodiversity data for undergraduate (4) and postgraduate (11) students, researchers (11), conservations (2), academics (12) and policy makers (19). Participants were from twelve (12) institutions across Lagos state, a few participants attended from Oyo and Kwara states in Nigeria. Modules delivered at the workshop include: Introduction to GBIF, The Project, Data Types and Data Capture, Darwin Core format, Data Mobilization and Planning, Data Cleaning and Publishing Tools, IUCN red-listing of Species and Species Distribution Modelling. (Evidence attached)

Research article: A research article on "Diversity and Use of plant collections in the Lagos University Herbarium, Nigeria" has been submitted to Feddes Repertorium and is currently under review for publication. (Submission ID: fedr.202200055). GBIF was duly acknowledged for providing funding for the data mobilization.

Visibility of Lagos University Herbarium: A database of the collection was created and used to populate the electronic identification key software purchased for the project. This has been deployed and can be found here: http://science.unilag.edu.ng/botany/Monocots_player.html

Publication of mobilized data: About 15,000 datasets have been published through the GBIF IPT. Details are provided below.

Deliverables produced by the project

Dataset deliverables

Dataset

Dataset type: Occurrences

Dataset scope: Higher Plant Collections of the Lagos University Herbarium (LUH): Families A - Z

Number of records: 8,092

Data holder: University of Lagos

Data host institution: University of Lagos

% complete: 100%

Status update: Completed

DOI: <https://doi.org/10.15468/ty22qw>

Expected date of publication:

Dataset

Dataset type: Checklist

Dataset scope: A Checklist of Higher Plant Collections in the Lagos University Herbarium (LUH), Lagos, Nigeria

Number of records: 1,784

Data holder: University of Lagos

Data host institution: University of Lagos

% complete: 100%

Status update: Completed

DOI: <https://doi.org/10.15468/q3m6xg>

Expected date of publication:

Dataset

Dataset type: Checklist

Dataset scope: A Checklist of Plants in the Nigerian Arid Zone

Number of records: 308

Data holder: University of Lagos

Data host institution: University of Lagos

% complete: 100%

Status update: Completed

DOI: <https://doi.org/10.15468/7hyj5>

Expected date of publication:

Dataset

Dataset type: Checklist

Dataset scope: A Checklist of Fulfulde Names of Plants from Mambila Plateau, Taraba State, Nigeria

Number of records: 183

Data holder: University of Lagos

Data host institution: University of Lagos

% complete: 100%

Status update: Completed

DOI: <https://doi.org/10.15468/kzf62a>

Expected date of publication:

Dataset

Dataset type: Checklist

Dataset scope: A Checklist of Plants Growing on the Akoka Campus of the University of Lagos, Lagos, Nigeria

Number of records: 142

Data holder: University of Lagos

Data host institution: University of Lagos

% complete: 100%

Status update: Completed

DOI: <https://doi.org/10.15468/nq3ev9>

Expected date of publication:

Dataset

Dataset type: Checklist

Dataset scope: A Checklist of African Sapindaceae

Number of records: 113

Data holder: University of Lagos

Data host institution: University of Lagos

% complete: 100%

Status update: Completed

DOI: <https://doi.org/10.15468/urbnhw>

Expected date of publication:

Dataset

Dataset type: Checklist

Dataset scope: A Checklist of Plants Growing in Lagos Wetland Ecosystems, Lagos, Nigeria

Number of records: 41

Data holder: Lagos State Ministry of the Environment and Water Resources

Data host institution: University of Lagos

% complete: 100%

Status update: Completed

DOI: <https://doi.org/10.15468/uag8kf>

Expected date of publication:

Dataset

Dataset type: Occurrences

Dataset scope: Herbarium specimens held at the College of Medicine, University of Lagos, Lagos, Nigeria

Number of records: 448

Data holder: University of Lagos

Data host institution: University of Lagos

% complete: 100%

Status update: Completed

DOI: <https://doi.org/10.15468/5ngcgq>

Expected date of publication:

Dataset

Dataset type: Checklist

Dataset scope: A Checklist of Plants in the College of Medicine Herbarium, University of Lagos, Lagos, Nigeria

Number of records: 426

Data holder: University of Lagos

Data host institution: University of Lagos

% complete: 100%

Status update: Completed

DOI: <https://doi.org/10.15468/ttebqk>

Expected date of publication:

Dataset

Dataset type: Occurrences

Dataset scope: A record of some Plants Used in Treatment of Diabetes in South West Nigeria

Number of records: 24

Data holder: University of Lagos

Data host institution: University of Lagos

% complete: 100%

Status update: Completed

DOI: <https://doi.org/10.15468/26jfhy>

Expected date of publication:

Dataset

Dataset type: Checklist

Dataset scope: A Checklist of Ornamental plants in the Lagos State Parks and Gardens Agency, Lagos, Nigeria

Number of records: 83

Data holder: Lagos State Parks and Gardens Agency, Lagos, Nigeria

Data host institution: University of Lagos

% complete: 100%

Status update: Completed

DOI: <https://doi.org/10.15468/7zy3gn>

Expected date of publication:

Dataset

Dataset type: Occurrences

Dataset scope: Ornamental plants growing in Lagos State Parks and Gardens Agency, Lagos, Nigeria

Number of records: 94

Data holder: Lagos State Parks and Gardens Agency, Lagos, Nigeria

Data host institution: University of Lagos

% complete: 100%

Status update: Completed

DOI: <https://doi.org/10.15468/h3gmr6>

Expected date of publication:

Dataset

Dataset type: Checklist

Dataset scope: A Checklist of Plants used in Traditional Medicine for Dental Illness in Lagos, Nigeria

Number of records: 146

Data holder: University of Lagos

Data host institution: University of Lagos

% complete: 100%

Status update: Completed

DOI: <https://doi.org/10.15468/7j42x9>

Expected date of publication:

Dataset

Dataset type: Occurrences

Dataset scope: A record of Plants used in Treating Dental Diseases in Lagos Nigeria

Number of records: 582

Data holder: University of Lagos

Data host institution: University of Lagos

% complete: 100%

Status update: Completed

DOI: <https://doi.org/10.15468/bygfuz>

Expected date of publication:

Dataset

Dataset type: Occurrences
Dataset scope: Trees of Lagos Metropolitan City, Lagos, Nigeria
Number of records: 1,033
Data holder: University of Lagos
Data host institution: University of Lagos
% complete: 100%
Status update: Completed
DOI: <https://doi.org/10.15468/wd8cb4>
Expected date of publication:

Dataset

Dataset type: Checklist
Dataset scope: A checklist of Plants growing in the Lagos Metropolis, Lagos State, Nigeria
Number of records: 80
Data holder: University of Lagos
Data host institution: University of Lagos
% complete: 100%
Status update: Completed
DOI: <https://doi.org/10.15468/e9qfps>
Expected date of publication:

Dataset

Dataset type: Occurrences
Dataset scope: Plant Collections in the Lagos State University Herbarium, Ojo, Lagos, Nigeria
Number of records: 193
Data holder: Lagos state University
Data host institution: Lagos state University
% complete: 100%
Status update: Completed
DOI: <https://doi.org/10.15468/b67erz>
Expected date of publication:

Dataset

Dataset type: Checklist
Dataset scope: A checklist of Plants held in the Lagos State University Herbarium, Ojo, Lagos, Nigeria
Number of records: 183
Data holder: Lagos state University
Data host institution: Lagos state University
% complete: 100%
Status update: Completed
DOI: <https://doi.org/10.15468/t9bmdv>
Expected date of publication:

Dataset

Dataset type: Checklist
Dataset scope: A checklist of Plants growing in Ibeju Lekki Wetlands, Lagos, Nigeria
Number of records: 71
Data holder: Lagos State Parks and Gardens Agency, Lagos, Nigeria
Data host institution: University of Lagos
% complete: 100%
Status update: Completed
DOI: <https://doi.org/10.15468/ugrnke>
Expected date of publication:

Dataset

Dataset type: Occurrences
Dataset scope: Medicinal plants used in treating snakebites in Benue State, Nigeria
Number of records: 18
Data holder: University of Lagos
Data host institution: University of Lagos
% complete: 100%
Status update: Completed
DOI: <https://doi.org/10.15468/w2gexd>
Expected date of publication:

Dataset

Dataset type: Occurrences

Dataset scope: Vegetation of Lagos Wetland Ecosystems, Lagos, Nigeria
Number of records: 54
Data holder: Lagos State Ministry of the Environment and Water Resources
Data host institution: University of Lagos
% complete: 100%
Status update: Completed
DOI: <https://doi.org/10.15468/q8srdu>
Expected date of publication:

Dataset

Dataset type: Checklist
Dataset scope: Checklist of medicinal plants used in treating snakebites in Benue State, Nigeria
Number of records: 17
Data holder: University of Lagos
Data host institution: University of Lagos
% complete: 100%
Status update: Completed
DOI: <https://doi.org/10.15468/e9qfps>
Expected date of publication:

Dataset

Dataset type: Checklist
Dataset scope: An inventory of Yoruba useful angiosperms in South West Nigeria
Number of records: 507
Data holder: University of Lagos
Data host institution: University of Lagos
% complete: 100%
Status update: Completed
DOI: <https://doi.org/10.15468/26x9sf>
Expected date of publication:

Dataset

Dataset type: Occurrences
Dataset scope: A survey of medicinal plants sold in Lagos herbal markets in Nigeria
Number of records: 126
Data holder: University of Lagos
Data host institution: University of Lagos
% complete: 100%
Status update: Completed
DOI: <https://doi.org/10.15468/cmb5cw>
Expected date of publication:

Dataset

Dataset type: Checklist
Dataset scope: A Checklist of Herbal plants used in Primary health care in Lagos State, Nigeria
Number of records: 163
Data holder: University of Lagos
Data host institution: University of Lagos
% complete: 100%
Status update: Completed
DOI: <https://doi.org/10.15468/mt7yt2>
Expected date of publication:

Dataset

Dataset type: Occurrences
Dataset scope: Floral Diversity in the Wetlands of Ibeju-Lekki Area, Lagos, Nigeria
Number of records: 77
Data holder: University of Lagos
Data host institution: University of Lagos
% complete: 100%
Status update: Completed
DOI: <https://doi.org/10.15468/dfk5mh>
Expected date of publication:

Dataset

Dataset type: Checklist
Dataset scope: A Checklist of Floral Diversity in the Wetlands of Ibeju Lekki Area, Lagos, Nigeria
Number of records: 51
Data holder: University of Lagos

Data host institution: University of Lagos

% complete: 100%

Status update: Completed

DOI: <https://doi.org/10.15468/nymz9z>

Expected date of publication:

Other deliverables

Webinar on digitization of herbarium specimen

Description: A webinar presentation on Digitization and Mobilization of herbarium specimen is organized and uploaded on youtube for wider audience

% complete: 100%

Status update: Completed

Sources of verification: <https://youtu.be/d3cl2fAisWM>; <https://unilag.edu.ng/?p=14500>

Improved Capacity on Data Mobilization

Description: Workshop on Application of Mobilized Specimen data for Policy Makers and Conservationist

% complete: 100%

Status update: Completed

Sources of verification: See attachment below and <https://unilag.edu.ng/?p=13422>
<https://drive.google.com/drive/folders/1FBV9pX29AVtz2VRqvdtfDxMmTH1V5Z07?usp=sharing>
<https://theconscienceng.com/biodiversity-data/> <https://punchng.com/group-calls-for-digitisation-of-specimen-data/>

Publication of Research Article

Description: A publication on the useful plants recorded in the project

% complete: 80%

Status update: Article is under review with the journal Feddes Repertorium

Sources of verification: Submission ID: fedr.202200055 (Attachment below)

Visibility of the Lagos University Herbarium

Description: Creation of database and electronic key for specimen identification at the LUH

% complete: 65%

Status update: The key is partially completed

Sources of verification: The Key is deployed at
http://science.unilag.edu.ng/botany/Monocots_player.html

Events

Stakeholders Meeting I

Dates: 2022-01-13 - 2022-01-13

Organizing institution: University of Lagos

Country: Nigeria

Number of participants: 51

Comments: See attached documents

Website or sources of verification: <https://unilag.edu.ng/?p=11701>

Events

A 3-day Capacity Workshop

Dates: 2022-06-28 - 2022-06-30

Organizing institution: University of Lagos

Country: Nigeria

Number of participants: 44

Comments: See attached

Website or sources of verification: <https://unilag.edu.ng/?p=13422>;
<https://theconscienceng.com/biodiversity-data/>

Events

Capacity Building Workshop for Policy Makers

Dates: 2022-02-23 - 2022-02-24

Organizing institution: University of Lagos

Country: Nigeria

Number of participants: 15

Comments: See attachment.

Website or sources of verification: https://www.linkedin.com/posts/temitope-onuminya-a15185a8_training-environmentaleducation-gbif-activity-6904549023228014592-3RPB?utm_source=share&utm_medium=member_desktop

Events

Webinar

Dates: 2022-10-12 - 2022-10-12

Organizing institution: University of Lagos

Country: Nigeria

Number of participants: 47

Comments: See link above

Website or sources of verification: <https://unilag.edu.ng/?p=14500>; <https://youtu.be/d3cl2fAisWM>

Events

Stakeholders Meeting II

Dates: 2022-12-22 - 2022-12-22

Organizing institution: University of Lagos

Country: Nigeria

Number of participants: 35

Comments: See attached.

Website or sources of verification: <https://unilag.edu.ng/?p=17638>, <https://lnkd.in/dgC8dS4A>

Communications and visibility

To ensure partners engagement and active participation in the project, physical and virtual meetings were held from time to time. Zoom meetings were held at the inception of the program and thereafter, every two months to the end of the project. WhatsApp chat of team members was used for instant communications regarding the project activities. Results emanating from the project were communicated through the university website and other national news publishing outlets, conferences, workshops, webinar, as well as publications on the GBIF website as well as through peer reviewed journal.

Monitoring and evaluation

Final Evaluation

Regular meetings were held to monitor the progress of the project mainly via virtual meetings. Project implementation plan has been effective and initial feedback from stakeholders revealed a need for further training on the mobilization procedure; this gap was filled through the planned workshop for the project. The institutional support for the project has been very good and this accounts for the timely delivery of the project outcomes. Also, the GBIF support provided was quite useful and enabled the attainment of success recorded in the project.

Best Practices and Lessons learned

Stakeholder Engagement

- Stakeholder Mapping- At the initial stage of the project, we carried out a thorough stakeholder analysis to identify functional stakeholders that will be involved in the project.
- Understanding Roles & Influence- Understanding levels of influence allowed the team to determine the roles of all the stakeholders.
- Identify the triggers/Challenges: Stakeholders reacted to different project actions in different ways. This has enabled the team to identify such triggers and come up with mitigative measures to deal with such triggers.
- The Opportunities: We were able to identify stakeholders with positive perceptions as project advocates.

Curation

- Rearrangements: Although the herbarium has been actively used by different researchers for their

studies, this is the first time the specimens are been generally overhauled and rearranged. As a result, there was a need for rearrangement of specimen following Angiosperm Phylogeny Group IV (APG IV) formats.

- Labeling of Herbarium Sheets: The name of some species was written on herbarium sheets instead of the herbarium label, probably there was no herbarium label at the time of preparing the voucher. We re-labeled the sheets and fit the species into appropriate families. Change of names were verified with the plant list <http://www.theplantlist.org/> while families which have been splitted or merged were properly arranged accordingly.
- Reconciliation of LUH Number: Due to a lack of database, several specimens were wrongly assigned the same voucher number, these were resolved using the collection dates.

Digitization

- None of the specimen has been imaged prior to this project. This was done and a repository was created to accommodate this.

Database Creation

- Microsoft Excel was easy to use for most of the players so was adopted. In addition, the LUCID e-key was deployed for ease of identification and has been found to be useful for species delimitation. However, more needs to be done to maximize its use.

Data Mobilization

- Most of the specimens were not properly classified as only Species and Family names were recorded on the sheet. Proper classification was done and validated through the GBIF portal
- Majority of the samples had only locations indicated on the sheets, no coordinates was recorded. So, Google Maps 2022 (<https://www.google.com/maps>) was used to get the coordinates for such specimens.
- Samples with verbatim coordinates were converted to decimal using GPS converter.

Data Publishing

- This was achieved with IPT and with minimal error messages.

Workshop

- This provided a platform for learning for all stakeholders
- The prior training organized by GBIF for project team members proved useful in facilitating the workshop
- The node and GBIF Monitor assigned to the project were also on hand to provide support as needed.
- Most participants were ready to learn and a number have been able to replicate the training in their institutions with our support.

Post Project activities

N/A

Sustainability

Sustainability Plans

To ensure sustainability of this project, 5 Undergraduates, 2 MSc and 2 Technical Assistants were trained alongside the Curator to be able to further the activities within the LUH. Similarly, at least 2 persons each were trained in each of the institutions that participated in the project across Lagos State.

Also, to foster understanding and appreciation of biodiversity by the general public and other stakeholders, presentations made on this project are made publicly available for use.

Impact of COVID-19 pandemic on project implementation

There has been no major impact of covid-19 on the project.

GBIF leads the Biodiversity Information for Development (BID), a programme funded by the European Union. The programme provides supplementary support for activities addressing the needs of regional researchers and policymakers through mobilization and use of biodiversity data.



