

Unlocking the flow of data on plant biodiversity for decision-making in S. Tomé e Príncipe

Programme:BID

Project ID: BID-AF2020-127-INS

Project lead organization:Centro Investigação Agronómica e Tecnológica de STP

Project implementation period:1/4/2021 - 31/3/2023

Report approved: 15/12/2022

Narrative Midterm report

Executive Summary

A project Inception meeting was held in June 2021 where partners met and discuss the chronogram and modalities for achieving the set goals. A member of the project team was selected to participate in the BID Capacity Workshop. In October 2021 a meeting was held in University of Coimbra with our partner COI, to plan the internship and select the specimens to be worked on. The Internship for 3 technicians was delayed due to the pandemic, and started in 15 January - 15 April 2022.

At National Herbarium of S. Tomé e Príncipe (STPH) work began with herbarium specimens mounted, computerized and introduced in the Specify program of STPH, witch allow us to published the first data set of 404 occurrences through GBIF on 29/01/2022, with the help of one of the mentors of our partner COI, through the GBIF Portuguese node.

All data relating to the specimens of Flora de STP, which were worked on at the COI by our 3 São Tomé interns were also published. This is a set of 2,547 herbarium specimens from STP flora, published by COI on April 2022 on the GBIF platform, within the scope of the project.

In May 2022 we organized a Workshop to launch the Project, which was attended by around 40 participants / stakeholders, representing the main national institutions working with data related to the biodiversity of STP. During workshop we present the project objectives and the results of the activities carried out so far.

In October 2022 we mounted, labeled, digitized and publish 858 occurrences from the STPH collections.

We intend to organize in Feb-March 2023, another Workshop in STPH on data publishing, with 2 specialists from COI, in order to strengthen the capacities of all the team members in this theme. Weekly reports & regular meetings are held to monitor the progress of the project.

Progress against milestones

Has your project published at least one dataset through GBIF.org?: Yes

Dataset published:

Dataset	DOI
Herbarium Specimens held by the National Herbarium of São Tomé and Príncipe (STPH)	10.15468/bktv9j
Herbarium of University of Coimbra (COI) - Unlocking data on plant biodiversity for decision-making in São Tomé and Príncipe	10.15468/mumwq6

Has at least one member of your project team received certification following the BID capacity enhancement workshop?: No

Rationale: Dilson Yordanis Lima Madre Deus is the project team member that participated in the BID capacity enhancement workshop.

Dilson had some difficulty in this workshop, because contrary to what had been announced, the sessions were all held in English, and although there was a mentor who spoke Portuguese, he couldn't translate the sessions, and only took some occasional doubts. Thus, our element was unable to finish both cases, and has submitted only a part of the responses from case 1 on July 17, 2021, but without the respective English translation. These responses, have been completed and duly translated, and have been submitted on 15 September (case I / case II), and we are waiting for the result of the Certification Process.

Report on Activities

Activity progress summary

1- Organization of Project: Organization of project activities & launch workshop were Delayed, but 100% completed (2022-05-11). We Organized the launching Workshop on May 2022 and developed action plans and informed key actors (Workshop presentations in annex).

2-BID Workshop: Participation in the BID Capacity Enhancement workshop was performed, and completed (submitted) on 15 September 2022: This will increase institutional capacity. The need to invest in the English language learning of the team members was highlighted.

3- Development of a Biodiversity Information Facility: Formalizing agreements for collaboration and research developed between the project partners and other identified stakeholders from key institutions holding or using plant data, in order to prepare STP to become a GBIF node (60%): 2022-05-11 - main national and international stakeholders were identified and participate in the launching workshop. Two members of the team participated in 2 meetings organized by UNDP (Proj. Liqueza Tela Non) on this theme (5 September; 17 Nov 2022) to prepare a Clearing House Mechanism and create a National Biodiversity Database. Other stakeholders institutions that also participated: OIKOS; BirdLife; Environment General Directorate; D. Fisheries; D. Forests; D. Industry and Commerce; D. PNOST; ALISEI; CIAT.

4 - Training in the mobilization of specimens: digitization and publications; Training on data analysis techniques (100%). We have increased institutional capacity with an internship held in University of Coimbra (COI), during 3 months, for 3 technicians from STPH (Final Report attached). Specific training with practical application was carried out on these topics using the STP specimens that were being worked on by our 3 interns during their internship at the COI.

An initial online training session was also prepared for the remaining team members, who were in S. Tomé, with the aim of clarifying doubts regarding data publication tools (4 February 2022). After the trainees return from Portugal, in April 2022, the knowledge acquired has been passed on to the other members of the team.

Final training is scheduled with the arrival of two COI specialists in March 2023. This training will last two weeks and will take place at STPH, and will allow the entire team to solidify their knowledge in data publication and also in techniques for organization and management of the Herbarium collection. The stay of these two specialists will be used to install and update some of the necessary computer programs to improve the profitability of future publication activities, as well as to start building the database for the Herbarium's online Catalogue.

5- Mobilization of data: Mobilization of data from partners and others local institutions (inventories, analysis). During the 3 months internship held in University of Coimbra (COI), our team worked and learned all herbarium techniques, and contributed to filling taxonomic /temporal/ geographic gaps in data availability. We have selected and worked with more than 2500 specimens from different collections/collectors of STP COI herbarium specimens, in order to make them available. During the stay of our team in Coimbra, Portugal, a data set of 3007 occurrences (herbarium specimens) was prepared and published in GBIF.org - 100% completed (Links above).

6 - Digitalization: Digitalization of general collection data and forest inventory data has been initiated in STPH, with the Digitalization and informatization and publication of 2 data sets (404 occurrences + 854 occurrences), increasing the availability of local biodiversity data (50%). However, the digitalization was suspended in January 2022, due to a malfunction in the photographic equipment, which had to be sent to the manufacturer (NIKON, Spain) for repair. It is already repaired but we received the equipment in STPH on August 2022, and only since then we could continue this activity.

7 - Database (SPECIFY; GBIF IPT) training and management tool to publish data (75%). For increasing institutional capacity, we hired an extra technician to work at the National Herbarium; this technician has been receiving training from colleagues who returned from the internship in Portugal, and training sessions have also been organized via the digital platform (ZOOM), with the mentors of the COI, in these thematic. Final training is scheduled, with the arrival of two COI specialists in March 2023. This training will last two weeks and will take place at STPH, and will allow the entire team to solidify their knowledge in data publication and also in techniques for organization and management of the Herbarium collection. The stay of these two specialists will be used to install and update some of the necessary computer programs to improve the profitability of future publication activities, as well as to start building the database for Herbarium's online Catalogue.

An Excel sheet was developed In order to facilitate the transfer of data to Specify and from this to the Darwin core models (Excel file in annex).

8 - Publication: Preparation of an Online Catalogue of the herbarium specimens; Updating the checklists of key flora species, and developing distribution maps of threatened, endemic, and rare species from STP. The STPH collectors lists have been organized (Lists in annex) as the first step to filling taxonomic /temporal/ geographic gaps in Herbarium data availability. Until now, we have mounted, labelled, computerized, digitalized and published 1.262 occurrences from the STPH general collections.

The project team (as part as the Project Flora Ameaçada de STP) actively participated in updating the Checklist of around 200 priority species, with the respective distribution maps having been drawn up; these data are published in two chapters (3,10) of the book "Biodiversity of the Gulf of Guinea Oceanic Islands", recently published and available online: <https://link.springer.com/book/10.1007/978-3-031->

06153-0; the team also contributed to the assessments or updated of the threat status, according to IUCN criteria, of about 110 species, that will be published at the Book "Red DataBook of the Plant Species Endemic to São Tomé and Príncipe" (expected to be available very soon). Annex - Contribution of the team to KBA & Red List.

9- Round table with policymakers: Round table discussion with policymakers to identify information priorities and to promote the use of openly accessible data. Decision makers can access and use best-available evidence to address national biodiversity priorities. In meetings with Directors of public institutions, these issues have been widely debated by our team. However, the recent change in the Government, after the elections of September 2022, makes it necessary to have a new round of discussions, since the Ministers and Directors have changed, and it is necessary to pass the information on to the current political decision-makers, at the beginning of next year. To be initiated 2023-01

10 - Other Publishing data: Publishing data papers (peer-reviewed), available nationally and internationally (GBIF). To be initiated 2022-11-01 /2023-03-31. The publications described above (see activity 8), contribute to global knowledge about STP biodiversity and are / will be accessible online, free of charge, in English and Portuguese.

The publication of data on the flora of STP on the GBIF platform is another way of contributing to increasing knowledge about the biodiversity of the islands of S. Tomé and Príncipe.

Completed activities

Activity: Organization of Project: Organization of project activities & launch workshop

Description: The organization of the project started in August 2021, but the launching workshop was delayed until the return of the team from the Internship at COI, Coimbra University, and it took place in 11/05/2022, with more than 40 participants from the main national and international organisations.

Start Date - End Date: 1/8/2021 - 11/5/2022

Verification Sources: Lauching Workshop-11May2022.JPG
GBIF-Apresentação-11-05-2022.pdf

Activity: Training in the mobilisation of specimens: digitization and publications

Description: Training in the mobilisation of specimens: digitization and publications ; Training on data analysis techniques (100%). We have Increasing institutional capacity with an internship held in University of Coimbra (COI), during 3 months, for 3 technicians from STPH. (Final Report attached).

Start Date - End Date: 15/1/2022 - 15/4/2022

Verification Sources: FINAL REPORT OF THE TRAINING CARRIED OUT IN THE HERBARIUM OF THE UNIVERSITY OF COIMBRA 1.pdf
FINAL REPORT OF THE TRAINING CARRIED OUT IN THE HERBARIUM OF THE UNIVERSITY OF COIMBRA 2.pdf

Activity: 5- Mobilization of data

Description: Mobilization of data from partners and others local institutions (inventories, analysis) 80%. During the 3 months internship held in University of Coimbra (COI), our team worked and learned all herbarium techniques, and contributed to filling taxonomic /temporal/ geographic gaps in data availability. We have selected and worked in more than 2500 specimens from different collections/collectors of STP COI herbarium specimens, in order to make them available. During the stay of our team in Coimbra, Portugal, a data set of 3007 occurrences (herbarium specimens) were prepared and published in GBIF.org - 100% completed for COI specimens.

Start Date - End Date: 15/1/2022 - 15/4/2022

Verification Sources: https://www.gbif.org/pt/occurrence/search?country=ST&dataset_key=a559e942-0fbe-4f09-93ca-28cf244ce2a0&advanced=1
https://api.gbif.org/v1/occurrence/search?country=ST&dataset_key=a559e942-0fbe-4f09-93ca-28cf244ce2a0&modified=2022,*

Report on Deliverables

Deliverables progress summary

Regarding the Dataset Deliverables:

Resources metadata COI

Dataset Type: Occurrences, from COI University of Coimbra natural history collections, we predicted an approximately number of Records of 2500

Data Holders: COI - Herbarium University of Coimbra

Sampling Methodology: Endemics

Current Format: 100% Digitized (not correct)

During the internship at COI, our team has been able to mount, restore and digitalised cc. 3000 specimens from the historical collections and from the main STP collectors, and this data has been published in 25/05/2022 in GBIF.org.

This sub-dataset contributes 3088 occurrence records of plant specimens sampled in São Tomé and Príncipe. The data have been digitized as part of the Herbarium of the University of Coimbra

contribution to the GBIF BID (Biodiversity Information for Development) project "Unlocking data on plant biodiversity for decision-making in São Tomé and Príncipe" BID-AF2020-127-INS. DOI: 10.15468/mumwq6

Dataset Catálogo On Line - Herbário STP, Occurrences, for Taxonomic catalog and check-list; Geographic: STP; Data Holders: STPH; COI, with an approximate # of Records: 7500.

Information on Specify and Publication of 1262 occurrences (2 groups of records) from STPH on GBIF (404 occurrences on 25/01/2022; 858 occurrences in 6/10/2022. DOI : 10.15468/bktv9j . The data have been digitized as part of the São Tomé e Príncipe National Herbarium collection (to be included in the Catálogo on-line);

Since October 2022, the old collection of STPH has been computerized, with 2 elements of the team transcribing to an Excel table all the existing information of each specimen contained in the labels, as well as in the records of the field notebooks that are available.

This activity is taking an extremely long time, and was not foreseen, since we thought to use the lists initially provided by the main collectors (eg Faustino Oliveira); however, we found that the collection numbers and the information on the existing specimens in the Herbarium could not be crossed with the data in the excel lists provided. As the collections are older (1990 - 2000) none are georeferenced, so we are also calculating the coordinates for the respective collection locations. Thus, we had to start reviewing, one by one, all the herbarium specimens of this important collection, and completely redo the lists, in order to obtain reliable information, which would allow its computerization, inclusion in the Specify and subsequent publication in GBIF, as well as its inclusion in the On-line Herbarium.

At present, 420 specimens are ready to be included in the STPH database. It remains to verify and computerize cc. 1600 herbarium specimens.

We expect to have this work completed by the end of February 2023, as we have now 4 elements of the team involved in this activity.

Dataset: Forest transects data

Dataset Type: Sampling Event

Dataset Description and Scope: Geographic: ST and P Taxonomic

Approximate # of Records: 1500

Data Holders: STPH

Expected Host Institution: STPH

Sampling Methodology:

Current Format: Undigitized

We have 1100 records computerized (excel files), but not digitized and they will be published accordingly.

DELIVERABLES:

1- Producing user-ready analyses of GBIF-mediated data that respond to policy questions:

Using the data collected during the previous project Flora Ameaçada, the team participated in the writing of two chapters (3,10) of the book "Biodiversity of the Gulf of Guinea Oceanic Islands" <https://link.springer.com/book/10.1007/978-3-031-06153-0>;

The team participated in September 2021 in a Workshop for KBAs evaluation (Annex KBAs-Red List);

The team is working on the Red List of Endemic Species of the Flora of STP (Annex KBAs-Red List).

2 - Mobilized data for STP flora species:

Published datasets (COI) - We have selected and worked with more than 2500 specimens from different collections/collectors of STP COI herbarium specimens, in order to make them available.

During the stay of our team in Coimbra, Portugal, a data set of 3007 occurrences (herbarium specimens) were prepared and published in GBIF.org (DOI: DOI10.15468/mumwq6) - 100% completed for COI specimens.

3- Training Workshop - GBIF

Dilson Madre Deus completed and submitted the final work on 15 September 2022, and is waiting for the certificate.

We also trained 5 people in biodiversity data mobilization and publishing.: Dilson Madre Deus - GBIF; internship at COI (15 Jan-15 April 2022)

Angela Lima - internship at COI (15 Jan-15 April 2022); Lewis Eduardo - COI online (Feb 2022);

Francisca - COI online (Feb 2022); Davide Dias - internship COI (15 Mar-15 April 2022). Reports of COI internships in annex.

An initial online training session was prepared for the remaining team members, who were in S. Tomé, with the aim of clarifying doubts regarding data publication tools.

After the trainees' return from Portugal, the knowledge acquired has been passed on to the other members of the team.

Final training is scheduled with the arrival of 2 COI specialists in March 2023 (Joaquim Santos and Filipe Covelo).

4- Checklist of STP Flora:

The project team (as part as the Project Flora Ameaçada de STP) actively participated in updating the Checklist of around 200 priority species, with the respective distribution maps having been drawn up; these data are published in two chapters (3,10) of the book "Biodiversity of the Gulf of Guinea Oceanic Islands", recently published and available online: <https://link.springer.com/book/10.1007/978-3-031-06153-0>; the team also contributed to the assessments or updated of the threat status, according to IUCN criteria, of about 110 species, that will be published at the Book "Red DataBook of the Plant Species Endemic to São Tomé and Príncipe" (expected to be available very soon). Annex - Contribution of the team to KBA & Red List.

5- Biodiversity database (Flora) setup at the STPH, with IT equipment and relevant software installed to catalog, store, and manage biodiversity data in STPH. At present we have Specify database

installed at STPH, and all the other types of equipment to prepare and manage the herbarium specimens and their data (PC; photographic equipment for digitalization; etc.). We expected an update of the actual version of Specify to be installed by our partners from COI during their stay in March 2023. We are also working on a program that facilitates the use of GBIF publishing tools for all the team members.

6- Stakeholders capacity needs assessment: Biodiversity data communicated to data users and collectors during our launch workshop in 11 May 2022 (Presentations in Annex).

7- Online STPH catalog: the preparation of the online catalog is on-going (May 2023), and we will start to focus on endemic and priority species. The project team (as part of the Project Flora Ameaçada de STP) actively participated in updating the Checklist of around 200 priority species, with the respective distribution maps having been drawn up; these data are published in two chapters (3,10) of the book "Biodiversity of the Gulf of Guinea Oceanic Islands", recently published and available online: <https://link.springer.com/book/10.1007/978-3-031-06153-0>; the team also contributed to the assessments or updated of the threat status, according to IUCN criteria, of about 110 species, that will be published at the Book "Red DataBook of the Plant Species Endemic to São Tomé and Príncipe" (expected to be available very soon). Annex - Contribution of the team to KBA & Red List.

Progress towards deliverables

Dataset deliverables

Resources metadata COI

Dataset type: Occurrences

Dataset scope: Dataset Description and Scope: University of Coimbra natural history collections
Approximate # of Records: 2500 Data Holders: COI - Herbarium University of Coimbra Expected Host Institution: STPH - Herbário Nacional de STP Sampling Methodology: Current Format: Partially Digitized

Number of records: 3,088

Data holder: COI

Data host institution: Herbarium of University of Coimbra

% complete: 100%

Status update: Publication of the dataset on GBIF on 25/05/2022 <https://doi.org/10.15468/mumwq6>
This sub-dataset contributes with 3088 occurrence records of plant specimens sampled in São Tomé and Príncipe. The data have been digitized as part of the Herbarium of the University of Coimbra contribution to the GBIF BID (Biodiversity Information for Development) project "Unlocking data on plant biodiversity for decision-making in São Tomé and Príncipe" BID-AF2020-127-INS.

DOI: 10.15468/mumwq6

Expected date of publication: 2022-05-25

Catálogo On Line - Herbário STP

Dataset type: Occurrences

Dataset scope: Taxonomic catalogue and check-list; Geographic: STP Approximate # of Records: 7500 (5000 STPH + 2500 COI) Data Holders: STPH; COI Expected Host Institution: STPH Sampling Methodology: Current Format: Partially Digitized

Number of records: 1,262

Data holder: STPH

Data host institution: National Herbarium of S. Tomé e Príncipe

% complete: 40%

Status update: Informatization on Specify and Publication of 1262 occurrences (2 groups of records) from STPH on GBIF (404 occurrences in 25/01/2022; 858 occurrences in 6/10/2022) The data have been digitized as part of the São Tomé e Príncipe National Herbarium collection (to be included in the Catálogo on-line) in the framework of the GBIF BID (Biodiversity Information for Development) project "Unlocking data on plant biodiversity for decision-making in São Tomé and Príncipe"; DOI : 10.15468/bktv9j. The team has mounted, computerized, digitalized and imported to Specify 2062 occurrences specimens; In addition to these specimens, the team assembled and computerized data from about 400 more occurrences. One of our team members, Angela Lima, was on maternity leave after the birth of her child (June-September), so this fact also delayed this activity, as we have one less person in a team that is already quite small for the work we have to do. Upon her return, and since October 2022, the old collection of STPH has been computerized, with 2 elements of the team transcribing to an Excel table all the existing information of each specimen contained in the labels, as well as in the records of the field notebooks that are available. This activity is taking an extremely long time, and was not foreseen, since we thought to use the lists initially provided by the main collectors (eg Faustino Oliveira); however, we found that the collection numbers and the information on the existing specimens in the Herbarium could not be crossed with the data in the excel lists provided. As the collections are older (1990 - 2000) none are georeferenced, so we are also calculating the coordinates for the respective collection locations. Thus, we had to start reviewing, one by one, all the herbarium specimens of this important collection, and completely redo the lists, in order to obtain reliable information, which would allow its computerization, inclusion in the Specify and subsequent publication in GBIF, as well as its inclusion in the On-line Herbarium. At present, 420 specimens are ready to be included in the STPH database. It remains to verify and computerize cc. 1600 herbarium specimens. We expect to have this work completed by the end of February 2023, as we have now 4 elements of the team involved in this activity.

DOI: 10.15468/bktv9j

Expected date of publication:

Other deliverables

Events

Internship in Herbario of University of Coimbra

Dates: 2022-01-15 - 2022-04-15

Organizing institution: CIAT and COI

Country: Portugal

Number of participants: 3

Comments: Our Partner COI - Herbarium University of Coimbra hosted and Trained 3 members of the STPH team in the mobilization of specimens: digitization and publications, and training on data analysis techniques.

Specific training and training with practical application was carried out on these topics and using the STP specimens that were being worked on by our 3 interns during their internship at the COI (Angela Lima; Dilson Madre Deua; Davide Dias).

Website or sources of verification: Internship Final Report at COI;

https://www.uc.pt/herbario_digital/news/Santomenses_estagio_news

<https://www.facebook.com/coiherbarium/posts/pfbid02PKB4ZdY4m5heKLFTMGv8uqYvCAZt7NEdDcb5AjNEBSeW5T7uVsihokn3U>

<https://twitter.com/CoiHerbarium/status/1>

Events

Launching Workshop

Dates: 2022-05-11 - 2022-05-11

Organizing institution: CIAT

Country: São Tomé e Príncipe

Number of participants: 40

Comments:

Website or sources of verification: GBIF-Apresentação-11-05-2022; Launching Workshop-11May2022.JPG

Communications and visibility

The project Results are being communicated through the University of Coimbra website (https://www.uc.pt/herbario_digital/news/Santomenses_estagio_news <https://www.facebook.com/coiherbarium/posts/pfbid02PKB4ZdY4m5heKLFTMGv8uqYvCAZt7NEdDcb5AjNEBSeW5T7uVsihokn3U> <https://twitter.com/CoiHerbarium/status/1>) and other news publishing outlets. Other means of communication will be via conferences, scientific publications, policy briefs and press releases. During the Launching workshop we have also presented all the preliminary results to the stakeholders, having a very participative debate session. Interviews were also carried out with the national media (radio and TV).

The project results (data sets published) are in the website of the STPH:

<https://stpherbarium.org/colecoes-2/>.

The project is also mentioned in website the Face Book page of Fundação Príncipe: <https://hi-in.facebook.com/FundacaoPrincipe/posts/1860490720808776>

Monitoring and evaluation

Monitoring and evaluation findings

The project team has successfully managed to complete some of the planned activities but we are still working to complete others. We have successfully trained 4 herbarium staff on the main Herbarium Techniques (mounting; digitization; informatization of herbarium data - Specify, and how to publish on GBIF data portal). So far, we have managed to digitize 4500 herbarium specimens and to published two occurrences datasets from 404 + 858 (STPH) and 2.587 preserved specimens (COI) into GBIF data portal.

The language barrier, due to the santomean team members not being fluent in English, has been a strong obstacle to completing the final phase of the BID capacity training. However, the internship carried out at the University of Coimbra made it possible to strengthen the ties between the partners, and the establishment of mentorships to support the resolution of technical problems that may arise in the publication of data, and without the language barrier.

Impact of COVID-19 pandemic on project implementation

The Internship at the University of Coimbra (COI) was delayed due to the pandemic, and only started in January 2022.

This delay greatly conditioned the progress of the project and the activities initially planned (workshop to launch the project and contacts with stakeholders), which were only carried out after the team returned to S. Tomé e Príncipe (May 2022).

European Union. The programme provides supplementary support for activities addressing the needs of regional researchers and policymakers through mobilization and use of biodiversity data.

