

BID Africa 2017 – National Grant Template

Final narrative report

Instructions

- Fill the template below with relevant information. **please indicate the reason of the delay and expected date of completion.**
- Use the information included in your project Full proposal (reproduced in annex III of your BID contract) as a baseline from which to complete this template
- The information provided below must correspond to the financial information that appears in the financial report
- Sources of verification are for example direct links to relevant digital documents, news/newsletters, brochures, copies of agreements with data holding institutions, workshop related documents, pictures, etc. **Please provide access to all mentioned sources of verification** by either providing direct link or sending a copy of the documents.
- This report must first be sent as a **Word document** to GBIF@GBIF.org and be pre-approved by GBIFS
- Once this report is pre-approved in writing by GBIFS, it must be signed by the BID project coordinator and sent by post to:

The Global Biodiversity Information Facility Secretariat (GBIFS)
Universitetsparken 15
DK-2100 Copenhagen Ø
Denmark

Template

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Project Information

Project Coordinator: Institution/network/agency name:

Parc Botanique et Zoologique de Tsimbazaza
Rue Fernand Kassanga, Tsimbazaza, Antananarivo, 101. Madagascar

Main contact person and role:

Rokiman Letsara, Project coordinator

BID proposal identifier:

BID-AF2017-0174-NAC

Project title:

BRYOTAN : Sharing data on a hidden diversity: the bryophytes of Madagascar

Start date and end date of the reporting period:

Mai 2018-January 2019

Country in which the activities take place:

Madagascar

Overview of results

Executive summary

Give a short summary of the activities implemented and the outcomes of the project for the reporting period (500 words maximum)

Bryotan management: A technician was employed from May, after the audition of two applicants. We finally selected Fara NANIARIMINO, who is very interested in bryophytes management and wants to learn more on taxonomy (<https://www.bryotan.com/fara-integrates-the-project-bryotan>).

Data management: The PBZT staff decided to use BRAHMS herbarium management, in order to get stable and standardized data. From BRAHMS, data are exported easily in Excel files, then imported in GBIF system after data cleaning. As it is uneasy to append data on GBIF servers, we waited the last moment to export our data to GBIF servers. We can say to day than **2400 occurrences are now available** (more than 3000 end of February, waiting last computerisation)

Images: images are stored on a server and will be linked by a permanent and unik link. Images are taken using the Motic camera and microscope especially bought for the project. We also acquired images with a standard microscope and personal cameras.

Herbarium management: we continued to sort the herbarium and to repack raw specimen. A first furniture in wood was used especially for bryophytes boxes, but was not really optimized after some manipulations. Then a dedicated metallic furniture was given from COI (Commission de l'Océan Indien) in order to store bryophyte specimen. They are now sorted by alphabetical taxonomical order in this furniture and are easily accessible.

Workshop preparation: we prepared the workshop, managing details from France and in Madagascar : administrative tasks to gather every body in time, to welcome bryologist in Paris before taking the plane, details for a stay in Madagascar .

A shared folder was created in order to give access to the Workshop members to publications.

The Malagasy team gathered material (microscopes from TAN university and Missouri Botanical Garden). The french team gathered material (glass slides, tweezers, small material, lamps, three microscopes) from different institutions and teams.

Arrangements were made in PBZT Herbarium, such as clean toilets and water access closed to the working room, for slide preparation, rehydration of bryophytes.



Shopping has to be done for participants restoration; tee-shirts promoting our project were also printed, and given with bloc and pens to the participants.

Workshop execution: the workshop held on September 2018, from September 22nd to September 29th. It was then followed by 6 days on the field, accommodation and field expenses (guides, entrances etc.) were taken in charge by the participants.

Four students from Mahajanga University and Antananarivo University were employed as helpers. They entered the newly identified specimen. But the computerization was slow, the students grouped in two teams and discovering the management of herbarium data. Fara, is still entering Herbarium data.

The workshop was really successful, according to all the participants.

Workshop results : seven new reports for the country were discovered in the collection during the workshop. A publication is in preparation.

Students training: During the workshop (and field trip), a training for the students. They prepare a master thesis on bryophytes, so we trained them in bryology and to the XPer system to describe taxonomy.

Progress against expected milestones:

Give an overview of all the expected milestones for your project from the beginning until now (see Annex V of your contract)

Expected milestones/activities	Completed? Yes/No	Explanatory notes	Sources of verification
Completed capacity self-assessment questionnaire for national biodiversity information facilities https://www.gbif.org/document/82277/capacity-self-assessment-guidelines-for-national-biodiversity-information-facilities (EN) https://www.gbif.org/document/82782/evaluation-des-capacites-pour-les-systemes-nationaux-dinformation-sur-la-biodiversite (FR) (Early Progress report milestone)	yes	Rokiman Letsara sent this self assesement questionnaire for early progress report	document sent
At least one national data publishing institutions are registered with GBIF.org Guidelines to become a publisher: https://www.gbif.org/become-a-publisher (Early Progress report milestone)	yes	Parc Botanique et Zoologique de Tsimbazaz	
At least one person from the project team has completed the certification process following the BID Capacity Enhancement workshop on Data Mobilization organized as a part of the BID programme Africa 2015 or BID programme Africa 2017 (Early Progress report milestone)	yes	Rokiman Letsara went to BID capacity workshop in South Africa	
Knowledge dissemination activities have been scheduled following the first BID Capacity Enhancement workshop (Early Progress report milestone)	yes	Rokiman Letsara disseminated activities, and all the bryotan team	
At least one dataset has been published to GBIF.org (Midterm report milestone)	yes	649 occurrences (31 mai 2018) 2400 occurrences (02 February)	http://ipt.madbif.org/resource?r=



		2019) 3249 occurrences to day	bryotan https://www.gbif.org/fr/project/1AftOTKUtaumqCqCloi06G/bryotan#datasets
The data users identified in the full proposal have documented their intended use of the mobilized data and provided early feedback (Midterm report milestone)	yes	Cooperative work through the MadBryo project, Andrea Sass-Gyarmati uses the dataset for her field of work on Lepidoziaceae. Students use the data for their master thesis (4 students in 2019). And each researcher interested in Madagascar bryophytes will use these data. From this dataset, and the one that are generated in Paris Herbarium (PC) and StLouis (MO), a first pertinent evaluation of Malagasy occurrences will be available.	Ex of an Xper key made in part with TAN specimens images http://bazzania-from-madagascar.identificationkey.org/mkey.html
All mobilized data have been published to GBIF.org (Final report milestone)	Yes	Full data set published, goal of 3000 reached end of February 2019. 3238 to day	
All published data meet the minimum requirements outlined in the Data Quality Requirements available at https://bid.gbif.org/en/community/data-quality/ (Final report milestone)	Yes	Data cleaning is conducted by Rokiman Letsara	Data published on ipt mad bif http://ipt.madbif.mg/resource?r=bryotan
The training outcomes of the project have been documented, including the number of people receiving certification through the BID Capacity Enhancement workshops, the number of people trained in nationally organized events, and the evaluation of the impacts of these training activities (Final report milestone)	Yes	Several training sessions were organized for students : bryophytes training (https://www.bryotan.com/like-a-swirling-hive-among-bryophytes) BRAHMS training: the technician Fara, and more generally herbarium staff (7 persons) were trained on BRHAMS system by Rokian Letsara. The training was conducted in one session, and then in daily assistance. Impact: the skill of Fara has been considerably enhanced.	BRYOTAN blog https://www.bryotan.com/like-a-swirling-hive-among-bryophytes https://www.bryotan.com/xper2-knowledge-database-training Workshop report https://www.dr



		<p>Nomenclature training: the training was completed by a nomenclature training by C. Reeb with Fara, in order that she can understand the meaning of the Taxonomical Darwin Core.</p> <p>XPer2 data base (https://www.bryotan.com/xper2-knowledge-database-training) two sessions were conducted</p> <p>Training on the field followed the theoretical one.</p> <p>Four students are now doing a master thesis on bryophytes, two in systematic (XPer data bases), one on endemism, one writing a booklet on Malagasy Bryophytes.</p> <p>New projects on bryology are proposed, for example «miniature forest» for educational and broad public, and continuation of BRYOTAN data mobilization.</p>	<p>opbox.com/s/a/zqa8qtj256ytl4/Workshop_Report.odt?dl=0</p> <p>Master publications ex: http://bazzania-from-madagascar.identificationkey.org/mkey.html</p> <p>two other are almost published</p>
<p>Final capacity self-assessments for national biodiversity information facilities have been completed with sustainability plans. https://www.gbif.org/document/82277/capacity-self-assessment-guidelines-for-national-biodiversity-information-facilities (EN) https://www.gbif.org/document/82782/evaluation-des-capacites-pour-les-systemes-nationaux-dinformation-sur-la-biodiversite (FR) (Final report milestone)</p>	<p>Yes</p>	<p>Sent to the GBIF by Rokiman Letsara</p>	
<p>All uses of the mobilized data have been documented (Final report milestone)</p>	<p>yes</p>	<p>Improvement of the Malagasy check-list. Exchanges with PC Herbarium which also sorted Malagasy bryophytes → comparison on samples may begin</p>	<p>Publication of 7 new reports for Madagascar from BRYOTAN https://doi.org/10.15553/c2019v742a5 5 Posters</p>



			<p>MADBRYPO-BRYOTAN submitted to IAB 2019 Madrid, ATBC 2019 in Antananarivo, Madagascar</p> <p>example https://www.dr.opbox.com/s/h715r5274e8932p/IAB_Poster_MADBRYO_A4.jpg?dl=0</p>
<p>Best practices and lessons learned have been documented (Final report milestone)</p>	<p>yes</p>	<p>Even if this workshop was successful, we discussed a lot with the participants in order to improve a future similar workshop. We may have done a written evaluation (such as a google form with defined questions) ; but time missed for that. It will be done for a future workshop. We just report here considerations from these numerous and free discussions.</p> <p>Herbarium : the working condition may be improved, especially by acquisition of good microscopes and binoculars lens. Here we used old material (except our new Moticam) and observations were not always easy for the researchers..</p> <p>The necessity for helpers and technician to be trained on computers implied that the beginning of the project was slower than what we expected.</p> <p>The unstable internet connection is really a problem to work concentrated. We bought</p>	<p>Worskhop report https://www.dr.opbox.com/s/azqa8qtj256ytl4/Workshop_Report.odt?dl=0</p>



Project deliverables and activities

Refer to the table in section 2.2 "Deliverables, activities and reporting criteria" of your BID full proposal. Provide updates on the status of each of planned deliverables. In the event of unexpected delay, please provide detailed explanatory notes and indicate planned completion date. Add as many rows as needed.

Deliverable	Related activity	Completed ? Yes/No	Explanatory notes	Sources of verification
Deliverables for GOAL 1 - Establish or strengthen national biodiversity information facilities				
Database of National herbarium specimens for bryophytes (mosses)	Herbarium data mobilization	yes	Gathering labels information = information are entered in BRAHMS data base that is now the software used by the TAN herbarium. Our technician has to train on BRAHMS system	TAN Brahms data base images https://www.bryotan.com/digitizing-and-data-cleaning
	New packaging and storage for easy and safe accession to the specimen		Repackaging and storage : All specimens have been repacked, even if some collection have not still be recovered	Websites images, https://www.bryotan.com
	Duplication of mixed species		~ 3500 new specimens were repacked ; two cases : <ul style="list-style-type: none"> • Specimen from the field raw envelopes • Specimen from old collection bags, which paper was too old and began to tear. 	Fara repackaging
	Barcoded envelopes	NO	We did not buy barcoding printer because the Herbarium is thinking of a standardized way for all the plants. So we wait the final decision, and a printer will be bought through another project..	200 specimen expected to be repacked, 3500 specimens were actually repacked . They are reported on lab. books by Fara or Roger Lala
	Geolocalization of old and new		All specimen with available information are geolocalized.	



	specimens	yes		GBIF data base, maps
Constitution of a committee for Malagasy Bryophytes	<ul style="list-style-type: none"> • Bring together bryologists, herbarium managers involved in Malagasy Bryophytes. IAB, international Association for Bryology will be asked to support this initiative. • First meeting in Paris, central for St Louis, Antananarivo, Paris. Then regular webinars will be conducted. • Build a common strategy in order to make available the huge amount of unexploited data in herbarium (could be estimated to more than 15 000). Main herbarium hosting Malagasy bryophytes: TAN (Antananarivo, Madagascar) PC (Paris, PC) and MO (St Louis, USA). 	Yes	<p>We created the MADBRYO Project, in direct link with Bryotan, but more generally devoted to Malagasy bryophytes, whatever herbarium or project. The steering committee consists of international experts in bryology, including the first Malagasy woman with a recent PHD in bryology (2018), and author of the checklist;</p> <p>A booklet is going to be written by one of our student, from Mahajanga university, presenting bryophytes and some flagship species descriptions</p> <p>An inquiry was sent to the different herbarium hosting bryophytes, through one of the steering committee member of the MADBRYO project, Michele Price from Geneva Herbarium (Jardin Botanique de geneve).</p> <p>Most of the herbarium answered, and the inquiries analysis is in progress.</p> <p>Discussions started</p>	<p>https://madbryo.org</p> <p>Master 2 student Rita RIVONIRIANA. The master 2 was supposed to be finalized in June 2019. She is working on (link to the plan). Booklet still in preparation.</p> <p>4 students engaged in the projects</p> <p>One technician really engaged in bryology (see also on the field https://www.bryotan.com/bryophytes-on-the-field-day-1)</p> <p>Technical help forces</p> <p>Excel files for "Nomenclature of Malagasy bryophytes"</p> <p>https://drive.google.</p>
	<ul style="list-style-type: none"> • Precise with BRYOTAN project 	Yes		



	<p>collaborators the plan to enhance availability of data from Madagascar herbarium, eventually completed by some specimens from PC or MO [see workshop description].</p>		<p>about this completion, but it is not possible in the context of this project to finalize exchanges. In PC (Paris Cryptogam Herbarium), a large scale project consisting of pulling out all the bryophytes of Madagascar from the general herbarium began. All mosses from Madagascar are recognized and pointed. But exchanges can only be considered if all specimen are clearly computerized, identified etc. This must be another step of our improvement on Malagasy bryophytes.</p>	<p>com/file/d/1aF6MJCCv2psA7Xg-iKYnoKnextnBycUgu/view?usp=sharing</p>
<p>Publication of National guide for bryophytes treatment and data mobilization techniques</p>	<ul style="list-style-type: none"> • Training of technician, about voucher management, bryophytes treatment for image acquisition, label homogenization, database management and rough bases on mosses systematics, useful for herbarium treatment. Bryologist from MNHN will come to Antananarivo and train, helped with local bryologists, the technician, PBZT staf, volunteer students and local botanists interested, and apply what was planned by the Committee • For image acquisition, only directly concerned staff will be trained, because of lack of 	<p>yes</p> <p>no</p>	<p>Fara was trained by Rokiman Letsara about all the computerization. Finally we decided that images will be aquired by R. Lala and C. Reeb, because I needs a longer training in bryology to get efficient. The time devoted to all our tasks was not enough to conduct that? But Fara is interested to continue and leran bryophytes, and has already be trained by Roger L. For images, our guide was useful at the beginning of the image acquisition, in order to define first sets of images. After sometime of images acquisition, we got used to the type of images to get, the objective to use, and finally we looked directly in identification keys in order to define which images to take.</p>	<p>Excel files on "Images of bryophytes" https://drive.google.com/open?id=1CNRjXrJxV3UAurpLV-koVeeWUQtMuDS</p>



	<p>efficient microscopes (one-two), and number of available computers. If this can be managed, more people will be trained. Treatment of major image possibilities in bryophytes through microscope and binocular lens (<i>In toto</i> leaves, sporophytes, spores, cross sections of stem, leaves etc). Use of the Moticam camera and post treatment (Gimp, Inkscape).</p>		<p>Fin</p> <p>The publication of a National guide for treatment and data mobilization techniques was too ambitious during the project time; it will be conducted when all images will have been uploaded.</p> <p>Roger Lala was trained on images acquisition and on post-treatment by Catherine Reeb.</p> <p>Finally, we tried to get the most images we can during the project, and the post-treatment will be conducted later, the images uploaded as soon as they will be treated correctly.</p> <p>Students (4) were also trained to computerization and herbarium management</p>	
<p>Collection of computerized images implemented in database and Website</p>	<ul style="list-style-type: none"> • Choice of images • Preparation of the samples under microscope, glass slides. Acquisition of selected images depending on the taxa, at the family or genus scale. Use of the Moticam camera. 	<p>yes</p>	<p>We get a collection of numerous images. Despite the good material (Moticam + one microscope) we bought, we were limited by the microscope availability. Only one person can work at the same time. C. Reeb came with her own camera, then two people can take images, but with an old microscope, with weak light as observation tool. We choose to keep images from this</p>	<p>~ more than 1000 images illustrating 70 mosses species and 40 liverworts species. This number increases each day and it is still on in 2020. https://www.dropbox.com/sh/9cntqljs31aeng6/AADBuaYX4FJa_7e1StGcxLTha?dl=0 Example on website https://www.bryotan.com/images-</p>



			<p>microscope, which, after a post treatment are correct. But the time spent is increased. So the images have to be treated (using GIMP) and the post treatment takes a long time.</p> <p>We get all the raw images, and we plan to treat them in the following weeks. They will be linked to each specimens. A full cvs file will be sent end of February to Rokiman in order than he can link images to specimens. We are still searching how to link species to images (that was the first goal); that could be done after the project through Tropicos, if the GBIF data are uploaded on this server. We need GBIF advice on this point.</p>	<p>samples A mean of 20 raw images by species, for 8 final (post-treated) images by species.</p> <p>See on GBIF https://www.gbif.org/occurrence/gallery?dataset_key=d06771c1-2276-49b8-81ba-f7be0887d0bd</p> <p>you may access to each species</p> <p>119 occurrences illustrated</p>
<p>Training and identification workshop in Antananarivo</p>	<ul style="list-style-type: none"> • Pre-workshop sorting : • Sorting the envelopes at the family/genus level in order to prepare the identification workshop. Correct most evident errors (Liverwort/mosses, or easy genus recognition such as <i>Polytrichum</i> for ex.) • Ask and receive unidentified mosses specimens from PC / MO herbarium to 	<p>YES</p>	<p>All the item are checked</p>	<p>see workshop report https://www.dropbox.com/s/azqa8qtj256ytl4/Workshop_Report.odt?dl=0</p> <p>Video presented to the first franco-malgache day at Museum National d'Histoire Naturelle, France https://drive.google.com/open?</p>



	<p>complete TAN specimen be treated by specialists. It will be done especially if the risk “over-evaluation for the sampling” is believed (see 2.7-1).</p> <ul style="list-style-type: none"> • Prepare the logistic of the workshop. • Workshop • Regrouping mosses specialists (~5-8 maximum) to work on their family or group in Antananarivo during ten days; This include training sessions for students, local bryologists or botanists interested in bryology. • A technician team, mainly composed of PBZT staff, the coordinator and students will manage specimens (determinavit, labels, envelopes, labels data etc.) in order to let the specialists at full time on identification work while identification sessions.. • Treatment and computerization of new information will 		<p>It was indeed not really possible to follow some of the reporting criteria, such as “number of duplicates”. Each participant of the workshop works at its own rhythm and it was impossible to follow each packet. We just noticed on identified envelopes if the identifier gave more than one species.</p> <p>The treatment of the non-dominant species in a sample is not already done.</p>	<p>Report of the data treated after the Workshop including</p> <ul style="list-style-type: none"> • very variable Number of envelopes prepared for each family or genus. • 1020 specimens identified or confirmed, • 2 + 4 students number of local botanists engaged in the workshosp. • No duplication, but in case of several species, each is taken app art in the original envelope, In a smaller packet. We evaluate at 1/3 of the 108 envelopes with more than one species. • 8 new taxon reported : 7 species and 1 variety; • 5 mosses species, 2 liverworts taxa (1 species, 1 variety) <p>Blog</p> <p>https://www.bryotan.com/the-workshop-began</p> <p>https://www.bryotan.com/tee-shirts-hats-and-mosses</p> <p>https://www.bryotan.com/bryophytes-</p>
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	<p>be conducted during the Workshop by technician and with students help.</p> <ul style="list-style-type: none"> • We strongly believe of the efficiency and powerful of this workshop that will boost Malagasy bryology. The test restricted to mosses could be then conducted on liverworts for future project. 		<p>It is a recurrent problem in bryology which is not already solved (do we make another envelope...but for a small amount of 4-5 stems, is it necessary ? do we keep in the original envelope, so we have to give another number etc.). We propose to keep that question for a further program of the Herbarium.</p>	<p>treatment-during-the-workshop</p>
<p>Deliverables for GOAL 2 - Increase available biodiversity data, within and beyond the grant period</p>				
<p>Exchanges with other herbarium for non treated families during the workshop</p>	<p>no</p>	<p>ready to do</p>	<p>The limit is the difficulty to ship herbarium specimen, with the administrative rules, and the cost of such sending via private transporters from Madagascar. that makes shipping very complicated. It could be better, for time saving, for specimen security and for efficiency of the results to organize other meetings gathering specialists, and to prepare their return with specimen they are interested in.</p>	
<p>Deliverables for GOAL 2 - Increase available biodiversity data, within and beyond the grant period</p>				
<p>Web site on Malagasy bryophytes</p>	<p>yes</p>	<ul style="list-style-type: none"> • Creation and management of the web site "Bryophytes of Madagascar" (Tropicos server), it will host general information on bryophytes, specificities, historical consideration 	<p>Availability of the website</p> <ul style="list-style-type: none"> • Number of specimens and taxa data available • Number of images loaded → not still available. Images are in post treatment and will be load by unik links as soon as possible. 	<p>Web site on Malagasy bryophytes from the general MADBRYO project in collaboration with BRYOTAN https://www.madbryo.org and bryotan website https://www.bryotan.com</p>



		on Malagasy bryology, links on data hosted on the GBIF national node (check-list, sampling data) on Taxonomical data (Xper databases).		
Publication on GBIF Portal of Malagasy Bryophytes database with specimens, images and taxonomy	Sharing data, Publication of data on GBIF Portal	<ul style="list-style-type: none"> • Transfer of data to the GBIF portal using IPT tools, under Darwin Core record fields, data quality control and standardization of the data. Hosting on GBIF national node MADBIF. • Type of data : Check-list of Malagasy Bryophytes, sampling event and localization. • Load images on GBIF and linked databases of the Website. • Build links with i-Naturalist 	<p>Number of taxa and sampling events treated</p> <p>Number of geolocalized specimens</p> <p>Number of images → around than 100 post treated images.</p>	<p>Publication on GBIF Portal of Malagasy Bryophytes database with specimens, images and taxonomy.</p> <p>3238 occurrences uploaded, 119 with images. Still increasing after the project. One month stay in feb. 2020 to improve a last submission.</p> <p>Bryotan results on the web site https://www.bryotan.com/bryotan-results0effc0bc https://www.bryotan.com/images-samples https://www.gbif.org/occurrence/gallery?dataset_key=d06771c1-2276-49b8-81ba-f7be0887d0bd</p>
Exchanges with other herbarium for non treated families during the workshop	yes	<ul style="list-style-type: none"> • After the Workshop, for taxa not treated during the workshop, preparing and sending 	<p>Specimen have been loan by specialists who came to the workshop, in order to finish taxonomical work in their institution.</p> <p>Database completion numeric data published on</p>	



		<p>specimens to specialists, exchanges with other herbarium managing Malagasy bryophytes such as PC (Paris, France), MO (St Louis, USA), EGR (Hungaria).</p> <ul style="list-style-type: none"> • Looking for other herbarium through the world which may host Malagasy specimens, sometimes after personal field-trips (ex Cardiff herbarium). This could be optional, because it will be limited by the capacities and time of BRYOTAN. • Sign cooperation agreements in order to share their data on GBIF portal and on the web site. • Crossing the data with quality verification. 	<p>the website:</p> <ol style="list-style-type: none"> 1. Number of taxa and specimen identified or confirmed, number of specialists included in this part. 2. Number of new species reported for Madagascar 3. Number of new potential species for science 	
<p>Elaborate Xper data bases</p>	<p>yes</p>	<p>Production of Xper databases on selected genus/family (<i>Leucobryum</i>, <i>Polytrichum</i>, <i>Dicranaceae</i> ...) in order to enhance</p>	<p>Hyperlinks on Xper database using Xper3 http://www.xper3.fr/?langue=en</p> <p>Number of Xper databases (generally genus, may be family databases). Three to five expected minimum.</p> <p>Number of students</p>	<p>Two databases are conducted by Malagasy students (Polytrichaceae by Miarisoa Solofonomenjanahary and <i>Bazzania</i> by Eliane Andriamiaja). Master thesis will be presented in June.</p>



		<p>student and bryologists training both in bryology and in IAO knowledge data. In links with SEPD2D project. Example to follow a full work-flow from specimen to data sharing, and complete taxonomic implementation</p> <p>This is the first stage for a future Flora on Malagasy mosses</p> <p>Note: Xper database are not an obligation for BRYOTAN project, but it is an interesting initiative to enhance taxonomic data availability. It will depend on funding (see remarks in § risks 2.7)</p>	<p>engaged in bryophytes taxonomy, number of licence interships, master degrees</p>	<p>Bazzania is now public http://bazzania-from-madagascar.identificationkey.org/mkey.html</p> <p>One student in France is working on Xper database on Pallaviciniaceae.</p>
Deliverables for GOAL 3 - Apply biodiversity data in response to national priorities				
Elaboration of a National Program for future bryophytes exploration and conservation	no	<ul style="list-style-type: none"> • Estimation of species abundance from herbarium data (temporal and spatial data) → towards a Malagasy mosses red list • Geographical analysis of specimens distribution • Estimate 	<p>It is really too early regarding to our knowledge of Malagasy bryophytes. We must wait other herbarium results too</p>	



		unexplored areas for bryophytes → towards National plan for exploration of bryodiversity		
Communicate on mosses to the public → Elaboration of mosses presentation leaflet to be distributed in institutions, conservation structures, governmental institutions, schools etc.	yes in progress	Publication of the leaflet and distribution through educational network, institution and protected areas network. Communication with institutional structures in order to raise the awareness of bryophytes in conservation plan.	One of our student from Mahajanga, Rita Rivoniriana (student in ecology and conservation sector) is working on a booklet for her master thesis.	master thesis in June and booklet printing after



Datasets published on GBIF.org

Refer to the table in section 2.4 “Biodiversity data mobilization plan” of your BID full proposal. If the dataset is not yet published, please indicate the name of the institution that is expected to host the data when published in the column “DOI or URL/Planned hosting institution”. Add as many rows as needed.

Dataset title	Publishing institution	DOI or URL/Planned hosting institution	Date/expected date of publication	Explanatory notes
Bryophyte specimens at TAN Herbarium	PBZT	https://www.gbif.org/dataset/d06771c1-2276-49b8-81ba-f7be0887d0bd	02/02/2019	last data cleaning 2400 occurrences
Bryophyte specimens at TAN Herbarium	PBZT	https://www.gbif.org/dataset/d06771c1-2276-49b8-81ba-f7be0887d0bd	Published 2019	3238 occurrences

Examples of use of biodiversity data available through GBIF

Data mobilised through the BID programme, ultimately, should guide natural resource conservation and management policy. We require you to report on how you have integrated these data into these policy-making processes. You may want to refer to the section 2.5 “Plan to support the integration of biodiversity information into policy and decision-making process” of your original proposal as a reminder of your original commitments.

As part of that process, we request you to provide us with a summary of how you have used these data within the decision-making process and we have included some guiding questions below to help with that process. Please note that if your dataset has been combined with other datasets in analyses that guide the decision-making process, then this should be recorded too.

Description

Has your project been successful in integrating data within the policy-making process? yes

Where did the demand for these data come from? from researchers in bryology

If yes, which policies have been developed using your data? taxonomical treatment and revision of genus/families (Bazzania, Breutelia, Riccardia, Polytrichaceae, Marchantiopsida etc.)

If no, what were some of the challenges you faced in getting your data into those processes?

Did you have a biodiversity data integration plan from the beginning of your project? If so, did you have to adapt your plan as the project progressed and why did you have to make those alterations? ?no

In what format are your data being used i.e. what were the analyses, if any, that you needed to perform on the data to ensure that they was in a format accessible to policy-makers? probably export of excel sheets and s of images ot confirm identifications.



What level of communication has there been with the relevant policy stakeholders i.e. by which means? With what regularity? And, how critical have these interactions been for the development policy-relevant analyses?

What additional support (resources, tools, network, training) would be needed for your project to ensure the flow of information from mobilisation to decision-making?

We urgently need training for Malagasy young bryologist. We gave an initiation, but we need a real course, one or two weeks, with practice under the microscope in order to enhance their capacities.

The second thing is...that we need time. As said several times, bryophytes are tiny, difficult plants that need microscope slide preparation for each observation, for images etc. Sometimes you have to make cross section on a stem around 500 µm. It is not really difficult when you are used to, but it takes time. We were probably too much optimistic concerning the capacity of treatment of our team, knowing that one of the partners is in France, and came three times for the project, but on too short periods (two weeks, for workshop preparation, workshop and last stay for final data treatment). We must stay one month, if possible in a future project, in order to work in depth.

How would you improve on your own processes in the future to improve data integration in the future?

We need to train local bryologists and to inform more on the bryophytes interest. A training workshop is needed, on one week with good material for observation (correct training microscopes and binoculars).

Data may serve other purposes other than for policy-making and these are as valuable. How was your data used for other purposes e.g. development of training materials, scientific publications, communication activities etc?

Our data will serve for publications. With the workshop participants it is planned to write :

- A publication on the project and the seven new reports from Madagascar from the Herbarium (going to be submitted to "Phytokeys")
- A checklist of Andasibe surroundings, based on their collection and on herbarium data-quality. Notice that the specimens collected could not already be sent because of administrative regulations and delays for exportation etc authorizations.
- Epiphylls of Pandanus.

Images will be used for Xper database, which goal is to store data in a dynamic and modifiable way, waiting for a full treatment in some years and the publication of a flora on Malagasy bryophytes.

Supporting materials

As part of our reporting, we request you to provide us with a copy of any materials highlighting data use on your dataset, either on its own or in combination with other datasets. This could be in the form of:

- Reports – governmental, ministerial, non-governmental organisations, international policy-making bodies
- Policy briefs
- Scientific publications
- Outputs from analyses that will be used in the future e.g. species distributions maps and other spatial analyses
- Education/communication materials

Please provide a valid dataset to the doi. Where the doi is not known, please state why.

Name of resource	Type of resource i.e. report, policy brief, scientific publication, analysis output, education materials, communication materials, other (please specify)	Dataset doi	Link to document or publication citation
	Scientific publication will be submitted to "Phytokeys" ^{www} A collaborative effort to increase our knowledge of the diversity of Malagasy bryophytes in natural history collections: An example from the		



	recent TAN herbarium identification workshop		
	Andriamiarisoa, R.L ¹ ; Abalo-Loko, S.; Brinda, J. ¹ ; Fischer, E. ² ; Hodgetts, N. ³ ; Lavocat-Bernard, L. ⁴ ; Letsara, R. ⁵ ; Naniarimino, F. ⁵ ; Reeb, C. ⁶ ; Sass-Gyarmati, A. ⁷ ; Vanderpoorten, A. ⁸ (authors are listed alphabetically)		

Events organized as part of the project

List all the events that have been organized as part of your project. Please provide links to any documents or webpages documenting the use in the "Sources of verification" column. Add as many rows as needed.

Full title	Organizing institution	Dates	Number of participants	Sources of verification
Identification workshop	PBZT	22/09/2018 → 29/09/2019	15	<p>Blog https://www.bryotan.com/tee-shirts-hats-and-mosses</p> <p>https://www.bryotan.com/like-a-swirling-hive-among-bryophytes</p> <p>https://www.bryotan.com/the-workshop-began</p>
Xper Training	PBZT	24/09/2018 + several individual trainings, including training in January 2019	8	<p>Blog https://www.bryotan.com/xper2-knowledge-database-training</p> <p>https://www.bryotan.com/like-a-swirling-hive-among-bryophytes</p>
BRAHMS training	PBZT	July 2018		Blog BRHAMS training
Bryotan Field trip	PBZT	29/09 → 06/10/2018	15	Blog





Updated calendar for the BID project implementation and evaluation period

The calendar should be completed in the same way as in the Full Project Proposal, but should include any expected changes. Provide reasons for any expected changes in section 4.1 'Explanatory Notes'.

Implementation period start date and end date (dd/mm/yy)																
Activity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Notes
Herbarium data mobilization	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Includes all activities, from envelopes to geolocalization
Committee for Malagasy Bryophytes meeting in Paris		X							X							Knowledge is not enough strong to build a National plan. We have to finalize at least herbarium identification
Technician training		X	X	X	X			X	X							After Meeting in Paris; training with bryologist of MNHN and MBG
Image acquisition and treatment				X	X	X	X	X	X	X	X	X	X	X	X	a continuous work along the project
Workshop											X	X				~ 10 days with training sessions, but work up and down the workshop
Website				X	X	X	X	X	X	X	X	X	X	X	X	Could be less; a management of the web site with updating is easy after beginning. If Tropicos is used, the soft is already available.
Sharing Data, Publication on GBIF Portal								X	X	X	X	X	X	X	X	~ 2400 data are uploaded on February 2 nd 2019, > 3000 end of February.
Database completion											X	X	X	X	X	
Elaborate Xper databases			X	X	X	X	X	X	X	X	X	X	X	X	X	A parallel activity that will enhance taxonomical data. Will end in June 2019
Elaboration of a National Program for future bryophytes exploration												X	X	X	X	Dry areas will be our future priority, and latitudinal comparison of humid forests
Leaflet on bryophytes									X	X	X	X	X	X	X	Master thesis, a booklet will be produced
Early Progress evaluation & Reporting					X			X								





Evaluation period start date and end date (dd/mm/yy)				
Activity	1	2	3	Notes
<Activity name>				
<Activity name>				

Explanatory notes:



This programme is funded by the [European Union](#)

Sustainability plans

Explain the approach that will be taken to ensure the sustainability of the project's results after the end of your project (500 words maximum)

Herbarium improvement: this project allowed a great step forward on bryophytes conservation in TAN herbarium. At the beginning of the project, Bryophytes were just stored in paper boxes, with to curation or sorting. Now we get a real herbarium, sorted following taxonomy, and verified for more than 1000 specimen. But the job is not finished . We are going to mobilize energy and try to organize another workshop in one year, based on our first experience.

Herbarium will continue to be treated, computerized by volunteer, including our technician who wants to continue, at a lower time investment of course to computerize data. But we hope to find funding to continue to pay her full time.

Entering new specimen: as new field trips are going to be conducted, including the field trip which followed the workshop, new specimen will be added. We are sure that our colleagues will identify their specimen and we planned to publish a catalog of bryophytes from Andasibe surroundings, from this field trip and using also Herbarium data.

Training of bryologists and technician: we would like also to confirm our technician Fara and offer her a real training in bryology as she is really interested. This can be done through participation of training workshops abroad, but also through a training workshop organized in Madagascar. This is our favorite option, and could be planed iend 2019 or 2020.

Image treatment : new images will continue to be acquired bu Roger Lala, as volunteer, but not at the same rhythm as during the project where he could work full time on images in the last months.

Students will use the microscope to acquire images for their Xper database. These images will be uploaded on the GBIF data. Post treatment will be conducted by Catherine Reeb, in France and images will be uploaded progressively.

Improving geographical analysis: we are going also to analysis geographical distribution of these first dataset, in order to evaluate un-explored area.

Open knowledge on bryophytes, the "miniature forest project". We want to build a project in the PBZT Parc consisting of a path to discover bryodiversity . Mosses are present, in Tsimbazaza Parc even than less than in the humid forest and adapted presentation with enlarged images or fixed lens will allow people to discover this unknown diversity. This has been already conducted in South America.

In conclusion, bryophytes are not already known and this project was a first step to highlight this flora. Now international collaborative work ins needed in order to compare and synthesize data. It is initiated through MADBRYO / BRYOTAN project collaboration.



Beneficiaries/affiliated entities and other cooperation

Relationship with project partners

Please describe the relationship between your project coordinating team/institution and your project partners, and with any other organisations involved in implementing your BID project.

the relationships were always very fair play, friendly and efficient. All of us want to continue to work together, probably including more local bryologists and some essential people such as Lova Marline, a young Malagasy PHD (2018,), working in South Africa, but involved in Malagasy bryophytes too, she is the first author of the checklist, and member of the steering committee of Madbryo. We learnt a lot with this project, and we are ready to continue our efforts on bryodiversity from Madagascar.

Links to other projects and actions

Where applicable, outline any links and synergies you have developed with other actions, e.g. GBIF nodes, other BID funded projects, etc. If your organization has received previous grants in view of strengthening the same target group, to what extent has your BID project been able to build upon/complement the previous project(s) ?

BRYOTAN has a direct link with the more general project MADBRYO, involving several international researchers. MADBRYO basis are the collection improvement, but it is also open to new scientific problematic, such as phylogenetic diversity, biogeography, that need collection accurate data

Visibility

Please refer to the [BID guidelines](#).

Visibility of the BID project

How is the visibility of your BID project being ensured?

- Website BRYOTAN, links on MADBRYO Website
- Live video for the first "journée franco-malache at MNHN" on September 27th
<https://drive.google.com/open?>
- The national channel TVM made a story including interviews us on BRYOTAN and bryophytes during the workshop. The subject was presented to national news on September. Link provided soon (video too heavy to be uploaded from the Herbarium)
- Story of the communication services of the Parc of Tsimbazaza, link waited. It will be used for PBZT communication.
- Proposal for an oral communication and poster for ATBC congress in Antananarivo in August 2019 (<https://atbc2019.org/>) on BRYOTAN project, and its links with MADBRYO, 2 posters on Xper databases, publication of the booklet.



This programme is funded by the [European Union](#)

- Tee-shirts and hats were successful, provoked questions and interest every where, initiated discussion around the project and bryophytes more generally. It was even seen in China !

Short summary

Visibility was ensured by videos for colleagues involved in Madagascar but also by mediatic interventions for a larger public. The website also give a visibility to the project.

There is more work to do, but we all are motivated to continue and finalize what was planed for our BID project, except some points that are not reasonable or mature for the moment (e.g. national publication on bryophytes conservation → more data needed, analysis needed including other herbarium data).

Sources of verification

<https://drive.google.com/open?>

<https://www.bryotan.com/tee-shirts-hats-and-mosses>

<https://drive.google.com/open?> (video on the workshop for the *Premières journées Franco-malgache MNHN*.)

[Link of the TV story soon provided](#)

Visibility of the EU contribution

How is the visibility of the EU contribution being ensured within your project implementation?

The logo of EU is always presented with GBIF BID and institutional logos.

The logo is also on the tee-shirts and hats.

Short summary

Sources of verification

<https://drive.google.com/open?>

<https://www.bryotan.com/tee-shirts-hats-and-mosses>

<https://www.bryotan.com/bryophytes-on-the-field-day-1>

[Link of the TV story soon provided](#)



Signature  Rokiman LETSARA

Name of the contact person for the BID Project: Rokiman LETSARA



Date report sent by email in Word format to bid@gbif.org for pre-approval:
30/01/2019_____

Date report sent by post to GBIF Secretariat: 31/01/2019____from France_____

