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BID Africa 2017 – Small 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 <u>direct link</u> or sending a copy of the documents.
- This report must <u>first</u> be sent as a **Word document** to <u>BID@GBIF.org</u> 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

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Template

1. Table of Contents

This programme is funded by the <u>European Union</u>

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2. Project Information

2.1. Project Coordinator: Institution/network/agency name: Mrs. Géraldine d'Unienville, Le Velo Vert, President

2.2. Main contact person and role: Mrs. Géraldine d'Unienville, Le Velo Vert, President

2.3. BID proposal identifier: BID-AF2017-0316-SMA

2.4. Project title: Getting the plants to all: dissemination of information from the collection of The Mauritius Herbarium

2.5. Start date and end date of the reporting period: 01-Oct-2017 to 31-Dec-2018

2.6. Country in which the activities take place: Mauritius

3. Overview of results

3.1. Executive summary

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

The following activities and respective outcomes that took place during the period of this project (not necessarily in chronological order):

a) All flowering plants collections (specimen, spirit and carpological) of The Mauritius Herbarium were barcoded and imaged (the latter only mounted specimens that totals 24,600 photos). Images were taken in the image station that was created with BID funds. Automatic renaming of specimens using its barcode through BRAHMS increased the speed and precision, but manual checking was necessary because of occasional mistakes. This was a major achievement the target was 7,000 specimens to be completed during the period of this project.

b) Barcoding and imaging were important tools to detect errors in existing database entries, as for example: 1) duplicates entered as individual specimens, 2) missing specimens, 3) typos and 4) information from label wrongly placed in the different fields of the database.

c) The Mauritius Herbarium became the first data provider of Mauritius in the GBIF. The first five datasets published by Mauritian institutions were uploaded as part of the activities of this project.

d) A checklist of the native species of Mauritius and Rodrigues with their accepted names of family, genera and species was done in BRAHMS, including authorship and citation. This information was published as two separated checklist in the GBIF.

e) A library of gazetteer based on specimens housed at The Mauritius Herbarium was created to include synonyms. Estimated geographic locations were added for most gazetteer using printed maps, scientific publications, notebook and Google Earth as majority of specimens housed at The Mauritius Herbarium are 'pre-GPS era'.

f) A checklist of species found in and around organic fields was compiled and published in the GBIF, as well as the monitoring (event data, including information about the sites of occurrence). A relational database of the insects found in selected plant species according to available literature was compiled and published.

g) A member of The Mauritius Herbarium (Dr C Baider) followed the first BID Capacity Enhancement Workshop (end of November to January 2018). The training was vital to ensure that the digitisation planning and process were workable and steps were well established, with data and metadata cleaned and formatted to DwC standards. Also, the same person followed the 2nd BID Capacity Enhancement Workshop (April 2018). The latter training was instrumental to one specific goal of this project (mapping), and to deepen knowledge of some other technical aspects (e.g. ecological niche and IUCN redlisting), together on how best mainstream biodiversity information for decision making. This course was retaken online when new tools were made available and more in-depth explanations and exercise were prepared by the BID-GBIF staff/volunteers (Dec 2018 - Jan 2019).

h) A list of 45 commonest species found in organic fields were chosen from for featuring in an field booklet (short pocket format), which was published in print in December 2018. For each species original photos were taken, and available information on how to identify them, their propagation, climatic envelope, uses and insects that have been recorded on them were compiled.

3.2. 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 data holding institutions https://www.gbif.org/document/82785/self-assessment-guidelines-for-data-holding-institutions (EN) https://www.gbif.org/document/82813/modele-dauto-evaluation-pour-les-institutions-detentrices-de-donnees (FR) (**Early Progress report milestone**)	Yes		Annex 1 and Annex 2 of Early Progress Report (Jan 2018) Questionnaire from November 2017 is enclosed (Annex 1)
Expected milestones/activities	**Completed? Yes/No**	**Explanatory notes**	**Sources of verification**
At least one national data publishing institutions are registered with GBIF.org Guidelines to become a publisher: https://www.gbif.org/become-a-publisher	Yes		https://www.gbif.org/publisher/98bb2db4-4405-4e77-a568-fc596f29177c

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(*Early Progress report milestone*)			
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 the BID programme Africa 2017 (*Early Progress report milestone*)	Yes		Advanced Badge received [for C. Baider] (Annex 2)
Knowledge dissemination activities have been scheduled following the first BID Capacity Enhancement workshop (*Early Progress report milestone*)	Yes		Activities were done in the last semester of the project because of non-availability of the target audience
At least one dataset has been published to GBIF.org (*Midterm report milestone*)	Yes		Two datasets published by May 2018. Other three datasets published by December 2018
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		Organic farmers from Mauritius (but also Réunion) shown their support for free online data of changes observed on their field through time; a local parastatal supported the project by providing some information for booklet; actors in biodiversity conservation had informed that checklists are essential and some mentioned they had already downloaded available lists on the GBIF website. One of the published databases have been already cited (Wikipedia). User requested other checklist to be added (e.g. Crop Wild Relatives, native ferns, medicinal plants, cultivated plants, etc).
All mobilized data have been published to GBIF.org **(Final report milestone)**	Yes		A total of five datasets were published (two by May 2018 and three by December 2018). For details see Table 3.4
Expected milestones/activities	**Completed ? Yes/No**	**Explanatory notes**	**Sources of verification**
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		All published data upload met requirements
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		One person received certification through the BID (Annex 2 - Advanced Badge). Organised talks with different targeted audience were organised (see item 3.6). No replicate training of BID workshop took place yet. Continuity of activities (adding more published databases in the GBIF), either requested to be done by

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			The Mauritius Herbarium or other of the target audience was highlighted (especially by private collectors and a researcher - manager of private company). The Mauritian institution responsible for terrestrial biodiversity supported the request for Mauritius to become a voting member of the GBIF
Final capacity self-assessments for national biodiversity information facilities have been completed with sustainability plans. https://www.gbif.org/document/82785/self-assessment-guidelines-for-data-holding-institutions (EN) https://www.gbif.org/document/82813/modele-dauto-evaluation-pour-les-institutions-detentrices-de-donnees (FR) **(Final report milestone)**	Yes		Annex 3
All uses of the mobilized data have been documented **(Final report milestone)**	Ongoing		Uses of mobilized data were predicted under a targeted audience but other new uses initially not defined from different stakeholders are now being requested and are being recorded
Expected milestones/activities	**Completed ? Yes/No**	**Explanatory notes**	**Sources of verification**
Best practices and lessons learned have been documented **(Final report milestone)**	Yes		Digitization workflow improved speed and quality of outcomes, a more detailed and outreaching plan of digitization is in place; data quality and fit for use applied and data publishing learned; new skills acquired (e.g. mapping with QGIS, niche modelling), improved IUCN red listing skills

3.3. 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
The non-crop flora of organic fields (Taxon data)	Total list of species collected by 2018 published	Yes	Collected samples were identified at The Mauritius Herbarium, taxonomy was verified using multiple sources	https://www.gbif.org/dataset/6fd6f172-5877-4ebb-857f-2a7da6201d3e
The useful non-crop flora of Mauritius organic fields (Event	List of species collected in different months (2017- 2018)	Yes		https://www.gbif.org/dataset/bbd1eb9c-0d6b-45ee-b36a-d94c91abeaef

Deliverable	Related activity	Completed ? Yes/No	Explanatory notes	Sources of verification
data)	published			
Updated checklist of native angiosperms Mauritius and Rodrigues flora	List of species by 2018 published	Yes	List was built based on the *Flore des Mascareignes* (1976-onwards) and newer reviews or new published species. Taxonomy was verified using multiple sources - a few problematic taxa are included but request for clarification / information of authors of some recent changes was done	Mauritius: https://www.gbif.org/dataset/649fb99c-5bb1-4a3b-83df-7f9b3fe4dca6 Rodrigues: https://www.gbif.org/dataset/31770fdd-e4c5-4971-a2a8-31eadf292c8e
Mauritius and Rodrigues native angiosperm sites	Gazetteer list with geographic range of sites built as a library in BRAHMS (including synonyms)	Yes	Gazetteer list was constructed based on herbarium specimens. It includes outer islands of Mauritius (Agalega, St Brandon, Tromelin and Chagos Archipelago)	
Deliverable	**Related activity**	**Completed ? Yes/No**	**Explanatory notes**	**Sources of verification**
Non-crop species that help productivity or reduce pests and diseases in organic fields	List of non-crop species with recorded medicinal uses, host plants for insects, and other useful information with citation	Yes	Farmers requested information on insects as priority. Medicinal uses were not disclosed in booklet. Other information compiled was about propagation, climatic region where the species grow and known/potential uses in organic agriculture (e.g. use of leaves as insecticides, etc)	A relational checklist of insects was published online (https://www.gbif.org/dataset/46b6ccd4-52b7-4cdc-80ba-289aff2156bb). Other compiled information were published in the field guide entitled '*L'agroécologie pratique: Maurice, Réunion - Nos plantes-hôtes*'.
Distribution maps of non-crop species in agricultural organic fields	List of plots participating in the pilot program of organic agriculture	Data was analyzed for mapping but it did not fit purpose	First monitoring was done by different observers. Second and third monitoring were done by same observers but as they learned how to recognize more species with time (what was a good achievement), therefore the number of recorded species increased. Therefore, changes in species composition was driven by observers and they were not a result of true biotic and abiotic influences	List of species of each plot at different dates are found at: https://www.gbif.org/dataset/bbd1eb9c-0d6b-45ee-b36a-d94c91abeaef
Sample distribution maps of native angiosperms on Mauritius and Rodrigues	Gazetteer geo-location determine for majority of specimens without coordinates.	Yes	Most specimens at The Mauritius Herbarium do not bare coordinates. Attribution of latitude and longitude was done using different sources with estimation of error added	Few sample maps in Annex 4, plus digital link given where others are temporary stored

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3.4. 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
Checklist of non-crop plants in organic fields of Mauritius	The Mauritius Herbarium	https://www.gbif.org/dataset/6fd6f172-5877-4ebb-857f-2a7da6201d3e	Registration date: October 9, 2018 v.10 was published on October 19, 2018	These datasets was registered before but there was a number of issues with them, so they were removed and uploaded again. These new uploads included updated data after first registration
Monitoring of non-crop plants in organic fields of Mauritius	The Mauritius Herbarium	https://www.gbif.org/dataset/bbd1eb9c-0d6b-45ee-b36a-d94c91abeaef	Registration date: July 11, 2018 v.14 was published on October 16, 2018	
Checklist of recorded insects from literature associated with non-crop plants growing in organic field of Mauritius	The Mauritius Herbarium	https://www.gbif.org/dataset/46b6ccd4-52b7-4cdc-80ba-289aff2156bb	Registration date: October 19, 2018 v.1.6 was published on October 19, 2018	
Checklist of the flowering plants of the island of Rodrigues, Indian Ocean	The Mauritius Herbarium	https://www.gbif.org/dataset/31770fdd-e4c5-4971-a2a8-31eadf292c8e	Registration date December 31, 2018 v.1.1 was published on January 28, 2019	
Checklist of flowering plants of the island of Mauritius, Indian Ocean	The Mauritius Herbarium	https://www.gbif.org/dataset/649fb99c-5bb1-4a3b-83df-7f9b3fe4dca6	Registration date: December 30, 2018 v.1.1 was published on January 28, 2019	

3.5. 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.

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Description

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

Where did the demand for these data come from?

If yes, which policies have been developed using your data?

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?

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 are in a format accessible to policy-makers?

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?

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

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?

The demand for knowing which non-crop plants can be found in organic fields and their potential uses came from a group of farmers as a tool to support the routine management their plots. Data from collected plant samples in the fields and insects recorded using these species (mostly from literature, published as relational checklist) were integrated to create a booklet of the commonest non-crop plants found in organic fields (which was selected after the second monitoring event data). The project has made farmers more interested to know information about non-crop plants and their uses, therefore on which of those that can be left owing to their positive impact and which other plants that might need to be removed to avoid potential problems, as build up of harmful insects. The possibility of a more sustainable and chemical free integrated crop management is being demonstrated in the country by these pilot plots. The information gather so far was organised into a booklet with the preface by the Ministry of Agro-Industry and Food Security, with support from a local research institution on food agronomy (FAREI) and of the Chamber of Agriculture. Providing free information (e.g. the published datasets in the GBIF) made other stakeholders in the agricultural landscape and members of the public more supportive of the project. These tools were thus an important step to build trust in a field that is only recently being developed in Mauritius. Use of social media (mainly Facebook), local radio and newspaper made the project known to a larger local audience. Farmers were very receptive to the idea of online publishing and of the booklet, and they suggested other similar tools (for insects and diseases), and continuation of the monitoring. Also, as these first results were promising they requested information from other species to be added and the developers of Pl@ntnet are willing to create a micro-project page in the application, what would greatly increase the audience as the application has global and regional projects. These tools are to be used in the incoming organic farm school that Le Velo Vert is preparing to launch later in 2019.The visibility and the tools that developed during the BID project and others are being planned will support a growing community of organic farmers in the country. Le Velo Vert and its platform 'Organic Farmers of Mauritius' are in close contact with the responsible Ministry by personal meetings, communications in radio/newspaper and social media, and one of their aims is to showcase the feasibility of organic farming and how plants seen as weeds before can now be used as integrated part of agricultural practices instead of use of chemical harmful pesticides, herbicides and fertilizers.

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The demand for checklist of the native flowering species is a constant request that The Mauritius Herbarium receives from many different stakeholders from public in general, to local and international researchers (on biodiversity, medical research, etc), and Government agencies. Although the information can be found in the local flora that is mostly already published and other more recent scientific literature, it is difficult to those without access to these publications and to non-botanist to be able to build such list. The local Flora is in French and, for many, it is perceived as too technical. Also as the Flora started to be published in 1976, hence many changes to taxon name have occurred since. The checklists published are expected to be a tool for the incoming schedule for the protected native plants under the Native Terrestrial Biodiversity Act of 2015. Private landowners that have educational and research projects (such as the Ebony Forest) said that they will use the checklists to keep an updated record of the species present in their sites. The checklist and the gazetteer library (that will need to be made available) are to be used also as a support for the national Red Listing or those made in reviews or other publications, but also as a tool for the country to fulfil obligations under international agreements as the Convention for Biological Diversity. Mauritius joining the GBIF will be an important step to highlight the importance of online publishing and increase mainstreaming of biodiversity data.

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	Dataset doi	Link to document or publication citation
L'agroécologie pratique: Maurice, Réunion - Nos plantes-hôtes.	Book	Datasets used in the book: https://doi.org/10.15468/9hczsd https://doi.org/10.15468/a91rgh https://doi.org/10.15468/z50cwv	Hard copy to be sent to BID with full report documentation
Review of *Costularia* (Cyperaceae)	Scientific article by main author, Dr Isabel Larridon, for Kew Gardens, UK	Larridon I, Rabarivola L, Xanthos M, Muasya AM. 2019. Revision of the Afro-Madagascan genus *Costularia* (Schoeneae, Cyperaceae): infrageneric relationships and species delimitation. PeerJ 7:e6528 https://doi.org/10.7717/peerj.6528	Review completed for submission to scientific journal during the project period (article was published on 27 February 2019). Data on the species in the Mascarenes were used for mapping and IUCN Red Listing
Species distribution maps		Not yet published	Few selected maps in Annex 4

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3.6. 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
Talk about GBIF and online data for the National Parks and Conservation Services staff	The Mauritius Herbarium	September 2018	7	Annex 5a
Talk about the BID project for the Le Velo Vert staff	The Mauritius Herbarium	26 December 2018	4	Annex 5b
Talk about GBIF and online data publishing for the two private collectors and a manager of a restoration/educational conservation site	The Mauritius Herbarium	28 December 2018	3	Annex 5c
Launching of the field guide booklet	Le Velo Vert	20 December 2018	100	Annex 6 and http://ionnews.mu/video-un-livre-sur-lagro-ecologie-publie-a-lintention-des-adeptes-de-produits-bio-241218/ https://pt-br.facebook.com/LeveloVert/posts/1879528258813206 https://www.zinfos-moris.com/Lancement-du-livre-L-AGROECOLOGIE-PRATIQUE-NOS-PLANTES-HOTES_a3459.html

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4. 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 (01/10/17)																
Activity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	**Notes**
Early Progress evaluation & reporting			X	X												Completed (January 2018)
Mid-term evaluation & reporting							X	X								Completed (May - October 2018)
BID Capacity Enhancement workshop – Data mobilization and publication (Online training - Participation is mandatory)				X	X											Completed (January 2018)
BID Capacity Enhancement workshop – Data use (Online training - Participation is mandatory)							X	X	X					X	X	Completed (June 2018); second online course followed and case study submitted for marking (January 2019)
Checklist from organic fields and monitoring data				X	X	X	X	X	X	X	X	X	X			Checklist of species and monitoring for 2017-2018 published
Field guide of common and useful plants organic field					X	X	X	X	X	X	X	X	X	X		A 107-pages booklet was produced and published in December 2018.It contains information on how to recognise the species, how they are used by local farmers (for green manure, insecticides, etc.) Information is also being sought through the cooperation with the agriculture institute of France (CIRAD) and their collaborators on Réunion, in the EU project AgriSource, EMBEROI - Agriculture Résiliente Océan Indien (https://www.agrisource.org/en/7_113/2023/emberoi---experimentation-agricole.html). Discussion on the possibility of turning the information compiled so far and photos taken for the field guide into a mobile application are ongoing with developers of Pl@ntnet
Checklist native species Mauritius and Rodrigues	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Completed (December 2018)
Gazetteer list for Mauritius and Rodrigues				X	X	X	X	X	X	X	X	X	X	X	X	Completed (December 2018). Some gazetteer could not be

																ascertain a geographic location because there are more than one site with same name or contain names that could not be traced back in any map, book or notebook
Mapping (organic fields)													X	X		Data was analyzed for mapping but it did not fit purpose because first monitoring was done by different observers. Second and third monitoring were done by same observers however as they learned how to recognize species better with time, the number of species increased [what is a good outcome for the project nevertheless].Observed changes in species composition were driven by observers and they were not a result of true biotic and abiotic influences, therefore the initial idea of understanding spatial-temporal changes of species could not be achieved. As the project of organic fields is continuing, new data by same observers is expect to produce this objective.
Mapping (native flora)									X	X	X	X	X			

Evaluation period start date and end date (01/01/19)				
Activity	1	2	3	**Notes**
Final financial and narrative reporting		X	X	
Financial accounts	X	X	X	
Report writing	X	X	X	

4.1. Explanatory notes:

5. 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)

The coordination of the organic agriculture by the Le Velo Vert ensured that most of the land owners of pilot organic fields involved from the start of the implementation of this pilot crop programme are continuing to maintain their fields, and some new farmers joint in. This long-term cooperation has created a strong network of partners. Moreover, the support of the local agricultural research institute with the strong involvement of the French counterpart (CIRAD) motivates the continuation of research collaboration, especially because of regular field visits, workshops, discussions of results achieved and way forward for solving problems arising. The visibility given by the BID project through the booklet and three online databases published so far, the plant information and identification provided by The Mauritius Herbarium, and the technical assistance from abroad (also an European Union funded project) ensures that farmers are able to provide strong evidence of the sustainability and economic viability of their organic farming future to government agencies. The booklet was prefaced by the Honorable Minister of Agro-Industry and Food Security indicating country support of moving towards this type of agricultural practice. By producing the booklet with emphasis on the commonest plants found in the fields gaps in knowledge were highlighted, therefore indicating venues for scientific research. Information captured in the booklet and the online databases will be used as educational material for the organic farming school of Le Velo Vert. The Mauritius Herbarium and Le Velo Vert will be working to extend the number of species covered in an online version of the booklet to be hosted at Pl@ntnet. The continuation of the monitoring of the non-crop species on the fields is to be continued, therefore updates of the online databases are expected at regular basis.

The Mauritius Herbarium will continue the digitization of its collections, as part of its routine activities, using the work flow developed during this project, as it has been proven to increase efficiency and speed. With the today current reduced staff it is expected that ferns will be completed by the mid of 2019, with algae by maximum mid 2021. Lichens and bryophytes would require more time as collection need first in-depth curation. Occurrence data, from specimens and their respective images, are expected to be started to published in 2019, after details about the access to an approved and stable server is sorted out. It is expect that this could be done by the time Mauritius joins the GBIF (correspondence by Mauritius requiring assistance to the GBIF about the MoU was sent in April 2019), as a token of commitment, but if the process take longer, it will be published before. Other databases are nearly ready for publication (e.g. Crop Wild Relatives for Mauritius and Rodrigues). Adding further information for native species such as their uses, common name in each of the Mascarenes islands, are examples of features to be included in the existing published datasets or be done as separated datasets (as it might be easier for some end-users). Checklist and occurrence data from outer islands of Mauritius (Agalega, St Brandon and others) are also expected to be published in the GBIF in 2019/2020, as specimens from these localities have been digitized and imaged. It is expected that when Mauritius joins the GBIF, a more structured country facility for the node will be established that will support further data and products, including good storage and accessibility. It will also probably allow replication of some of the training already received from BID-GFIB under this project to speed up more institutions and individuals to share data within the requirements. For example, The Mauritius Herbarium has offered to support the publication of the checklist of the non-marine mollusks of the different islands of the Mascarenes and a subset of specimen occurrence data to the researchers working with it.

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6. Beneficiaries/affiliated entities and other cooperation

6.1. 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.

Le Velo Vert and The Mauritius Herbarium have strengthened its links with this project. Le Velo Vert invited the staff of The Mauritius Herbarium to events related to organic agriculture and introduced some of their regional partners for increase networking. Five university student trainees posted at Le Velo Vert spent 1-2 weeks at The Mauritius Herbarium to increase their understanding and skills of plant identification. The Mauritius Herbarium introduced the Le Velo Vert to the Pl@ntnet team for the development of a mobile application about the identification and uses of non-crop plants found in this project. Le Velo Vert received the support of the local agriculture research institute and of the the French, namely the CIRAD.

6.2. 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) ?

The successful imaging that is being achieved in this project is leading the team of the Mauritius Herbarium to be the trainers of a half-day workshop on imaging using BRAHMS for the curators of two herbaria of Madagascar and the Comoros in June 2018, project funded by the Indian Ocean Commission and European Union (Biodiversity project 2014-2018: http://commissionoceanindien.org/index.php?id=769   or http://commissionoceanindien.org/activites/biodiversite/) to create a common portal for the herbaria of the region (https://herbaria.plants.ox.ac.uk/bol/swioorchids).

7. Visibility

Please refer to the BID guidelines.

7.1. Visibility of the BID project

How is the visibility of your BID project being ensured?

Short summary

The BID, GBIF and EU logos featured in the banners and in the booklet produced for the project (Annex 5 and 6). They also can be seen in the Le Velo Vert's website for farmers (https://www.organicfarmersmauritius.org/) (Annex 7). Logos were also put in the presentations delivered and other the sharing knowledge activities (Annex 5 to 7).

Sources of verification

Photos in the said Annex (5 to 7), website above and booklet (hardcopy to be sent with printed report).

7.2. Visibility of the EU contribution

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

This programme is funded by the European Union

BID   **GBIF**

Short summary

Any new talk or training related with this project will use the logos of BID, GBIF and EU. The banners produced for the project are continued to be on display.

Sources of verification

As above

....

Signature _____

Name of the contact person for the BID Project: **Geraldine M. d'Unienville**

Date report sent by email in Word format to bid@gbif.org for pre-approval: **31/01/2019**

Date report sent by post to GBIF Secretariat: _____

⟩⟩ BID   **GBIF**

Annex 1: Self assessment (Nov 2017)

GBIF | Global Biodiversity Information Facility

Date

21/11/2017

BIODIVERSITY DATA HOLDER SELF-ASSESSMENT QUESTIONNAIRE

Institution / Collection name:

The Mauritius Herbarium

Section 1: Strategy

	No (0)	In progress/ incomplete (1)	Yes (2)
1. Does the collection have a defined (documented) mission which determines its role and purpose?	○	○	⦿
2. Has the purpose of the mobilization activity been defined?	○	⦿	○
3. Have the scope and extent of digitization efforts—their completeness, data elements, digital preservation, etc.—been defined?	○	⦿	○
4. Have curators identified or assessed any necessary or useful pre-digitization activities—sorting, selection of samples, taxonomic review, cross-checking against field notebooks, etc.?	⦿	○	○
5. Does the institution have a defined data policy that covers topics like intellectual property rights, custodial responsibilities, access, licensing, liability and privacy, sensitivity?	⦿	○	○
6. Has a database management system/software been selected?	○	○	⦿

Section 1: Overall score

Score 1-6: Initiate what is not started and consider actions to accelerate work in progress

Notes on strategy

The mission of The Mauritius Herbarium was set in 1960, went all plant collections in the country were put together to form the national herbarium. Data digitalisation started in 2004 to capture primary data (specimen information) and make it available in the future. It is now evolving to capture other aspects (taxonomy, species description, origin in each Mascarenes island, etc). Little pre-digitalisation activity was done - only a short list of species with authorities and collectors - to allow quicker data entry. Data policy has not been developed. The database software being used is BRAHMS.

BID   **GBIF**

Section 2: Digitization

	No (0)	In progress/ incomplete (1)	Yes (2)
1. Has a suitable digitization workspace been identified or set up?	○	○	◉
2. Has pre-digitization curation been carried out (sorting, selecting what to digitize, updating taxonomy and labels, specimen "health"/condition, assigning unique identifiers such as barcodes and general tracking)?	○	○	◉
3. Have digitization processes and technologies (text capture, imaging, multimedia, other) been defined?	○	○	◉
4. Have relevant data elements been mapped against important international data standards?	○	◉	○
5. Are workflows, including the handling of physical materials, well-defined?	○	◉	○
6. Are staff adequately and appropriately trained and equipped?	○	◉	○
7. Have quality control processes and standards—including taxonomy, georeferencing, typographical errors, field mismatch, technical and metadata specifications—been clearly specified?	○	◉	○

Section 2: Overall score

Score 8-14: Seek opportunities to help extend and maintain capacity in this area

Notes on digitization

A dedicated room for databasing was established in 2010, containing a dedicated computer and, very recently, a imaging 'station'. Data capture was all by typing direct the information of the specimens into BRAHMS. Imaging is being link by barcoding with automated image numbering. Taxon spelling, publication place and year, and authority information are crossed checked against different online databases and local published flora, and reference to primary literature when there are disagreements. Staff and trainees are made aware verbally on how to handle specimens. Many of setbacks during the digitalisation were due mostly to poor equipment. Quality control is improving as a reference library for taxonomy, authority, collector, etc are being populated.

BID   **GBIF**

Section 3: Publishing

	No (0)	In progress/ incomplete (1)	Yes (2)
1. Have the needs of expected end users and web publishing been fully considered in selecting appropriate data formats?	○	◉	○
2. Are the selected licences machine-readable and supported by GBIF?	◉	○	○
3. Has a (web) data publishing tool been selected and set up?	○	◉	○
4. Does the institution have access to stable data-hosting facilities?	○	◉	○

Section 3: Overall score

Score 1-4: Initiate what is not started and consider actions to accelerate work in progress

Notes on publishing

Database was made available as from 2010 using BRAHMS online via a dedicate BRAHMS MAU website. But after a database crash last year, it was not uploaded again to allow correction of errors that lead to the database collapse. On the other hand, part of the data is published in a regional portal accessible through BRAHMS website. I am not aware of the needs of a the selected licences machine-readable and supported by GBIF, but data from BRAHMS can be translated to GBIF.

Section 4: Curation and maintenance

	No (0)	In progress/ incomplete (1)	Yes (2)
1. Have processes been defined to accommodate updates from quality control and new information (e.g., taxonomic updates)?	○	○	◉
2. Does the institution have resources and processes to handle corrections and suggestions offered by web users?	◉	○	○
3.Are adequate processes in place to keep digitized data up to date with changes in curatorial information about the original materials, and vice versa?	○	◉	○

Section 4: Overall score

Score 1-3: Initiate what is not started and consider actions to accelerate work in progress

Notes on curation and maintenance

Taxonomical updates are done regularly using recent literature and, based on online databases after cross-checking with primary published articles. Taxonomical library is being built for easier reference of any curatorial information change. No suggestion from web users was ever received, however it would be possible to handle suggested corrections.

BID

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Section 5: Preservation and archiving

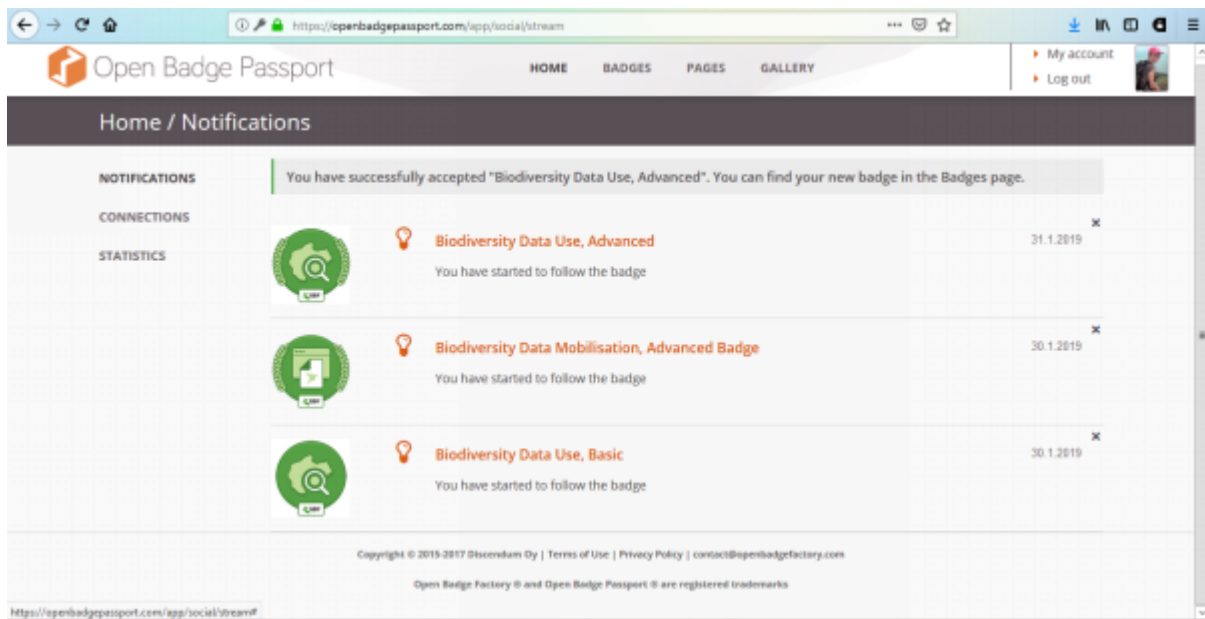|	No (0)	In progress/ incomplete (1)	Yes (2)
1. Does the institution have access to suitable long-term data archival repositories?	●	○	○
2. Does the solution adequately ensure the security of data and safeguard against obsolescence of data formats and applications?	●	○	○

Section 4: Overall score

Score 0: Concerted effort required to start building capacity in this area

Additional notes on preservation and archiving

Data is stored in the server at University of Oxford via BRAHMS but this might not be considered as long-term data archival repository. Hence, one of the aims of this BID project.

Strategy	Mission	2	Purpose	1	Scope & extent	1	Pre-digitization activities	0	Data policy	0	Database management system	2
Digitization	Workspace	2	Pre-digitization curation	2	Process & technology	2	Data standards	1	Workflows	1	Staff & equipment	1
											Quality control	1
Publishing	Data formats	1	Licence	0	Publishing tool	1	Data hosting	0				
Curation & Maintenance	Data updates	2	Corrections & suggestions	0	Database-specimen label synchrony	1						
Preservation & Archiving	Repository	0	Security & persistence	0								

Total Score 21 /44

BID   **GBIF**

Annex 2: Badges received for BID workshops

BID   **GBIF**

Annex 3: Self assessment (January 2019)

GBIF | Global Biodiversity Information Facility

Date
24 January 2019

BIODIVERSITY DATA HOLDER SELF-ASSESSMENT QUESTIONNAIRE

Institution / Collection name:

The Mauritius Herbarium

Section 1: Strategy

	No (0)	In progress/ Incomplete (1)	Yes (2)
1. Does the collection have a defined (documented) mission which determines its role and purpose?	☐	☐	◉
2. Has the purpose of the mobilization activity been defined?	☐	☐	◉
3. Have the scope and extent of digitization efforts—their completeness, data elements, digital preservation, etc.—been defined?	☐	☐	◉
4. Have curators identified or assessed any necessary or useful pre-digitization activities—sorting, selection of samples, taxonomic review, cross-checking against field notebooks, etc.?	☐	☐	◉
5. Does the institution have a defined data policy that covers topics like intellectual property rights, custodial responsibilities, access, licensing, liability and privacy, sensitivity?	☐	◉	☐
6. Has a database management system/software been selected?	☐	☐	◉

Section 1: Overall score

Score 7-12: Seek opportunities to help extend and maintain capacity in this area

Notes on strategy

The mission of The Mauritius Herbarium was set in 1960, when all plant collections in the country were put together to form the national herbarium.

Data digitalisation started in 2004 to capture primary data (specimen information) with the idea of making curation easier and faster, but also to make data available in the future. Little pre-digitalisation activity was done - only a short list of species with authorities and collectors - to allow quicker data entry following advice from BRAHMS team. With the BID project and the Indian Ocean Commission (COI) network of herbaria of the Indian Ocean (under the EU Biodiversity Proiect), a better planning of capturing data and creating libraries to improve quality of data entry was achieved. The scope of the digitalisation has evolve to capture other aspects - for example, high quality images, validity of taxon names, origin of the species (native, endemic [to which Mascarenes island(s), adding taxon information for Mascarene species not present in the collection (including non natives); barcode number of duplicate specimens in other herbarium/herbaria. Information in labels written in Latin or old handwriting (French or Enblish) is being added. When fern collection is fully databased and imaged (excepted by end of 2019), other aspects such as species descriptions will be added.

Available notebooks, historical books and maps, coupled with information in specimen labels are being consulted when necessary - as for example for adding a tentative geographic location to older specimens. Publications, notebooks and collectors logbooks are helping in understand why some specimens have multiple numbers (some are collector numbers, others accession numbers from the previous herbarium where specimens were first deposit and current accession).

The data policy has not been fully developed. Some aspects as location of endangered species are not to be given in details, although in many cases it has been disclosed from specimens deposited in other collections elsewhere.

The database software being used is BRAHMS v7. Discussion to move to BRAHMS v8 started via the COI (Biodiversity Proiect), however proposed prices by Oxford University Innovation so far are prohibitive. There might be a need to change software in the future if no agreement is reached, as the yearly price of BRAHMS v8 is above the full current yearly budget of The Mauritius Herbarium.

BID

GBIF

Section 2: Digitization

	No (0)	In progress/ incomplete (1)	Yes (2)
1. Has a suitable digitization workspace been identified or set up?	☐	☐	☉
2. Has pre-digitization curation been carried out (sorting, selecting what to digitize, updating taxonomy and labels, specimen "health"/condition, assigning unique identifiers such as barcodes and general tracking)?	☐	☐	☉
3. Have digitization processes and technologies (text capture, imaging, multimedia, other) been defined?	☐	☐	☉
4. Have relevant data elements been mapped against important international data standards?	☐	☐	☉
5. Are workflows, including the handling of physical materials, well-defined?	☐	☐	☉
6. Are staff adequately and appropriately trained and equipped?	☐	☐	☉
7. Have quality control processes and standards—including taxonomy, georeferencing, typographical errors, field mismatch, technical and metadata specifications—been clearly specified?	☐	☉	☐

Section 2: Overall score

Score 8-14: Seek opportunities to help extend and maintain capacity in this area

Notes on digitization

The dedicated room for databasing now contains a computer (with new hard disk and 3 TB of memory) and two imaging stations. Dedicated staff during the project followed a workflow for barcoding and imaging, gazetter, and corrections in entries, amongst others. Label data capture has not yet been used as many specimens had part of their labels already entered previous to this project. However, all imaging has been captured and linked to its specimen barcoding with automated image numbering (which was visually cross-checked for eventual mistakes). All existing taxon spelling, publication place and year, and authority information were added after being checked against different online databases, published flora, and reference to primary literature when there are disagreements. Additionally, some synonyms and taxon of species recorded for the Mascarenes, but not currently in the collection, are being entered into the database (work in progress). Quality control was much improved as reference libraries for taxonomy (family, genus and species/infraspecies), authority and collector, and gazetteer were constructed. As the flowering plant collection was imaged, any damaged specimen was fixed, with re-identification done in some cases. Also ancillary collections were linked to its respective vouchers and, when without voucher, dummy sheets were added the main collection for ease of location. Geodata for countries was completed by downloading information from TDWG, with country code (iso2 and iso3) added. Gazetteers were mapped at different resolution depending on the detail of the label information or using information from collectors notebooks, with the help of published articles with local maps (e.g. 1: 100.000, 1: 25.000) of different years (as some names changed with time) and GoogleEarth. Specimen imaged can now be done using this gazetteer library.

BID　　　　　　　　　　　　　　　　　　　　**GBIF**

Section 3: Publishing

	No (0)	In progress/ incomplete (1)	Yes (2)
1. Have the needs of expected end users and web publishing been fully considered in selecting appropriate data formats?	☐	☑	☐
2. Are the selected licences machine-readable and supported by GBIF?	☐	☐	☑
3. Has a (web) data publishing tool been selected and set up?	☐	☐	☑
4. Does the institution have access to stable data-hosting facilities?	☑	☐	☐

Section 3: Overall score

Score 5-8: Seek opportunities to help extend and maintain capacity in this area

Notes on publishing

Standard database fields from BRAHMS, mostly Darwin Core complaint, are being used. Therefore checklist and occurrence data are easily translated into format of data repositories. Data collected on ongoing project for organic farming was made available as checklist and sampling-event data. A relational checklist of insect and their recorded host plants was also made available and used for producing a field guide of selected non-crop species found in organic fields. All five databases made available in the GBIF had machine-readable licenses (CC-BY). Cloud IPT was used to data publishing. The Mauritius Herbarium database is currently hosted by the University of Oxford through BRAHMS. The possibility of hosting it also in Mauritius is being look at as physical connection with the Government server is on the way (the Herbarium is physical outside Government premises). In the meantime. some users have requested for selected data to be published in the GBIF (e.g. checklist of Crop Wild Relatives, medicinal plants, non-native species, etc).

BID   **GBIF**

Section 4: Curation and maintenance

	No (0)	In progress/ incomplete (1)	Yes (2)
1. Have processes been defined to accommodate updates from quality control and new information (e.g., taxonomic updates)?	☐	☐	⦿
2. Does the institution have resources and processes to handle corrections and suggestions offered by web users?	☐	☐	⦿
3.Are adequate processes in place to keep digitized data up to date with changes in curatorial information about the original materials, and vice versa?	☐	⦿	☐

Section 4: Overall score

Score 4-6: Seek opportunities to help extend and maintain capacity in this area

Notes on curation and maintenance

Alerts from Google Scholar and botany taxonomy journals (e.g. Taxon, Kew Bulletin, etc) were built/subscribed for help with taxonomical literature updates.

During development of taxonomical library, information was checked in different online databases and published literature. When in doubt, communication with authors of reviews was initiate.

No suggestions from web users has been yet received, however it would be possible to handle suggested corrections promptly. On the other hand, suggestions for correction of mistakes found in other databases (e.g. Tropicos, Paris Museum, etc.) were sent to their responsibles.

Keeping database update will be simpler and more reliable with all items in the collection having with its unique barcode and with different libraries have been built for support taxonomy (including synonyms being added), inclusion of available duplicate barcode number of specimens deposited abroad.

BID

GBIF

Section 5: Preservation and archiving

	No (0)	In progress/ incomplete (1)	Yes (2)
1. Does the institution have access to suitable long-term data archival repositories?	☐	◉	☐
2. Does the solution adequately ensure the security of data and safeguard against obsolescence of data formats and applications?	☐	◉	☐

Section 4: Overall score

Score 1-2: Initiate what is not started and consider actions to accelerate work in progress

Additional notes on preservation and archiving

Data is currently stored in different computers and external hard disk, and also at the server at University of Oxford via BRAHMS. Cabling from The Mauritius Herbarium to the Government server has been requested, and technicians already visited the premises for measurement and location of connection points.

Migrating to BRAHMS v8 will be important to avoid obsolescence as BRAHMS v7 is built on older computer language. Using BRAHMS v8 will ensure compatibility of existing database and with BOL end user will have a number of facilities for search database and imaging, mapping, etc. In case it might not be financially possible, other open source software might be investigate (e.g Specify).

Strategy	Mission	2	Purpose	2	Scope & extent	2	Pre-digitization activities	2	Data policy	1	Database management system	2
Digitization	Workspace	2	Pre-digitization curation	2	Process & technology	2	Data standards	2	Workflows	2	Staff & equipment	2	Quality control	1
Publishing	Data formats	1	Licence	2	Publishing tool	2	Data hosting	0				
Curation & Maintenance	Data updates	2	Corrections & suggestions	2	Database-specimen label synchrony	1				
Preservation & Archiving	Repository	1	Security & persistence	1						

Total Score 36 /44

BID   **GBIF**

Annex 4: Sample of distribution maps of native species

All maps were done in R, for the two main islands of the Republic of Mauritius (Mauritius [919 maps] and Rodrigues [132 maps]) and also for Agalega (42 maps). However, maps were not done for St Brandon as there are too few records. They are available at:

https://drive.google.com/drive/folders/1B_XgSwS-ScrAyEkoViI3bOd8RgLFBGps
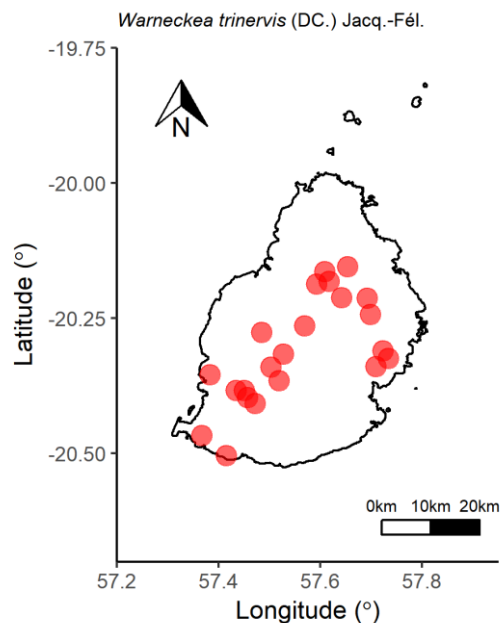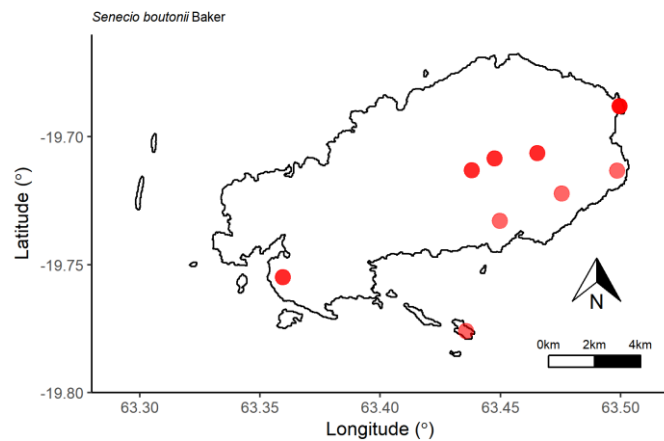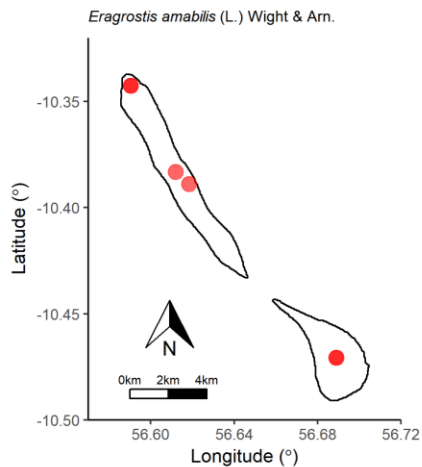
Examples of distribution maps based on specimens from MAU on Agalega (top left), Rodrigues (top right) and Mauritius (bottom left)

BID   **GBIF**

Annex 5: Talks delivered

A. Talk at the National Park and Conservation Services (NPCS)

Staff of the NPCS. The first person on the right is the current Director. The logo of BID and GBIF can be seen in the reflexion of the projection in the window pane.

B. Talk at the Le Velo Vert

Mrs Geraldine d'Unienville (President of Le Velo Vert) with staff

C. Talk at La Vanille Nature Park

Dr Christine Griffiths (Manager of the Ebony Forest), Mr Owen Griffiths (Director of Bioculture Mauritius) and Dr Vincent Florens (Associate Professor of Ecology, University of Mauritius)

Annex 6: Booklet launching

Staff of Le Velo Vert and of The Mauritius Herbarium during booklet launching

French Ambassador to Mauritius, Mr Emmanuel Cohet with Cláudia Baider and Géraldine d'Unienville

< BID-AF2017-0316-SMA >   <01-Oct-2017 to 31-Dec-2018>

Speech by Cláudia Baider from The Mauritius Herbarium during the booklet launching

Booklets being distributed to farmers involved in the organic farming project

This programme is funded by the European Union

BID   **GBIF**

Annex 7: Other visility of the project

A. Website visibility

BID   **GBIF**

B. Banner