GBIF | Global Biodiversity Information Facility

FINAL NARRATIVE REPORT

Guidelines on how to complete this report are included in italics.

Use the information included in your BIFA Full Proposal (reproduced in Annex 1 of your BIFA contract) as a baseline from which to complete this report.

Remember that this report will be made available on your project page on the GBIF website and therefore should not include any contact information, unless you have permission from all mentioned in the report that their contact information can be published.

Contents

Project information

Main contact person and role:	Nurainas
Institution/network/agency affiliation:	Herbarium of Andalas University (ANDA), Department of Biology, Mathematics and Natural Science, Andalas University
BIFA Project ID:	BIFA4_023
Project title:	Flora Sumatra: Digitizing and data basing specimens of the Sumatran Flora deposited at Herbarium Universitas Andalas (ANDA)-Part 2
Start date and end date of the reporting period:	1 May 2019 - 30 April 2020
Country in which the activities take place:	Indonesia

Executive summary

Please provide a brief summary of your project's objective(s), its implementation and achievements. You should also describe the context and the approach taken for the final evaluation of your project, and also the key best practices and lessons learnt identified. Remember to include any additional objectives that were defined during the implementation of the project and explain why they were added to the project's initial objectives. In the event of unexpected challenges which have prevented you to reach a planned project objective, please provide explanations and indicate if and how you plan to reach these objectives post project.

(Max. 350 words.)

[This project was the continuation of the previous BIFA3_017 project. The aim was to share more data on the floras from Sumatra deposited at Herbarium ANDA. In this project, we worked with GBIF Indonesian partner, InaBIF, and supported by Herbarium Bogoriense (BO), Kagoshima University (KAG), Edinburg Herbarium (E) and the Singapore Botanic Garden Herbarium (SING). Our parent institution, Andalas University, also supported the project and provided co-funding for it. Students from the Department of Biology, Andalas, University, were also involved in the project as volunteers for data collection.

In this project, we conducted a workshop not only to train the data entry team, but also to promote the project to wider audience. This year, representatives from several universities in Indonesia also attended the workshop. Materials for the workshop were adopted mostly from a workshop in Vietnam attended by our representative.

During the project, the issues on data management were minimal because most of the volunteers had an experience from the previous project. In this project, we targeted 20,000 sheets of specimens, consisting of two datasets; both were finished according to our plans. The issue in this project was the verification of species identification that took long

time to finish. This was the same issue we encountered in the previous project. It was mostly because the specimens were damaged by fungi and insects. To minimize issues, in this project, we recruited more volunteers to fix the damaged specimens.

In total, we have digitized 21,282 sheets of specimens, encompassing 790 species in 406 genera and 111 families of angiosperms. Among all the families that have been digitized, the family Compositae and Leguminosae were the families with the most digitized specimens. In this project, we also recorded four species of plants endemic to Sumatra. All of the data has been published in GBIF website through this link: https://www.gbif.org/publisher/43f4255c-f218-4a17-857a-ba3ac8456191.

This project has improved our experience and capabilities on team management, biodiversity data management following the Darwin Core standard, digital data management using state-of-the-art software, dataset management, and data publication using IPT protocol. Another benefit was that Herbarium ANDA acquired more equipment needed for specimen digitalization. We received additional equipment, such as a set of servers that capable of storing data in large capacity.]

Progress against expected milestones

Please indicate the status of the expected milestones as outlined in Annex 3 of the contract, at the time of final reporting.
Please provide links in the sources of verification.

In the event of unexpected delay(s), please provide detailed explanatory notes.

Expected milestones	Completed? Yes/No	Explanatory notes	Sources of verification
Gain certification at BIFA Capacity Enhancement Workshop **(Mid-term report milestone)**	yes	Attended by Ahmad Taufiq, finished all the task given by the committee, and received "advanced badge"	Photographs of BIFA Capacity Enhancement Workshop (Annex 1)
At least one dataset has been published to GBIF.org **(Mid-term report milestone)**	yes	Dataset titled "Flora of Sumatra: Vascular plant collection from Batang Toru Forest deposited in ANDA Herbarium	Dataset link: https://www.gbif.org/dataset/10f8ba9a-e298-4256-88b0-997205d66a30

Expected milestones	Completed? Yes/No	Explanatory notes	Sources of verification
All deliverables have been produced **(Final report milestone)**	80% complete	- All datasets have been published - Other deliverables 80% complete	Dataset link: https://www.gbif.org/publisher/43f4255c-f218-4a17-857a-ba3ac8456191.
Sustainability and next steps have been documented **(Final report milestone)**	complete	We are developing data entry form for offline database to simplify data capturing process.	Offline database (Annex 2)

Activities

Please indicate the status of the activities as outlined in the BIFA Full Proposal (section 4.4), at the time of final reporting.

*The table below should be completed in the same way as in the BIFA Full Proposal, but should include information and updates on the status of each activity. Please indicate relevant source(s) of verification and **provide links, or a copy of the source of verification** mentioned if no links are available. Attachments should be provided in the Annex.*

In the event of unexpected delay(s), please provide detailed explanatory notes and indicate new planned completion date(s).

Please include any additional activities completed during the implementation of the project that were not originally outlined in the BIFA Full Proposal.

Add rows as required.

Activity name	Expected deliverable	Contribution to goals listed in table 4.3 of the BIFA Full Proposal	Status of activity at final reporting: Completed? Yes / No (inc. % complete)	Explanatory notes, including new planned completion date if necessary	Source(s) of verification
Volunteer workshop/training	Occurrences data	To digitize the specimens hosted the Herbarium ANDA (data and image capture)	complete	30 persons member	Annex 3
Recruitment teamwork	Occurrences data	To digitize the specimens hosted the Herbarium ANDA (data and image	Complete	Total 15 persons member	Annex 4

Activity name	Expected deliverable	Contribution to goals listed in table 4.3 of the BIFA Full Proposal	Status of activity at final reporting: Completed? Yes / No (inc. % complete)	Explanatory notes, including new planned completion date if necessary	Source(s) of verification
		capture)			
Data capture (specimen and image data)	Occurrences and image data	To digitize the specimens hosted the Herbarium ANDA (data and image capture)	complete	Photo of specimen on Flickr pro	Flickr Pro Herbarium ANDA https://www.flickr.com/photos/144304656@N02/albums
Specimen ID verification	Occurrences data	To manage the taxonomic data from the specimens at Herbarium ANDA that can be integrated with GBIF	No (80% complete)	Verification took a long time. We are still working on updating species identification.	-
Data cleaning	Occurrences data	To manage the taxonomic and geographic data from the specimens at Herbarium ANDA that	complete	Total specimens were more than 20,000 sheets	-

Activity name	Expected deliverable	Contribution to goals listed in table 4.3 of the BIFA Full Proposal	Status of activity at final reporting: Completed? Yes / No (inc. % complete)	Explanatory notes, including new planned completion date if necessary	Source(s) of verification
		can be integrated with GBIF			
Publishing dataset and data paper	Data occurrences, and publishing on the checklist of Sumatran flora diversity (e-books)	To publish dataset of the flora of Sumatra on GBIF website, data paper to a reputable journal, and an oral presentation in a symposium to promote the database of Sumatran plant diversity	complete	All datasets have been published	Dataset link: https://www.gbif.org/publisher/43f4255c-f218-4a17-857a-ba3ac8456191.
Dissemination of the project outcomes	Conference presentation on Sumatran floristic diversity and its current	To publish dataset of the flora of Sumatra on GBIF website and data paper to a reputable journal as	No (40% and on track)	This activity was delayed because there was no symposium during the project period due to covid-19.	Annex 5

Activity name	Expected deliverable	Contribution to goals listed in table 4.3 of the BIFA Full Proposal	Status of activity at final reporting: Completed? Yes / No (inc. % complete)	Explanatory notes, including new planned completion date if necessary	Source(s) of verification
		well as oral presentation in a symposium for promoting the database of Sumatran plant diversity			
Build a database offline	More detailed information in the specimen dataset.	To create an offline database of the specimens at Herbarium ANDA	complete	Offline database used open-source sofware relational database management system.	Annex 2

Deliverables

This section should summarize the project deliverables as outlined in the BIFA Full Proposal (section 4,5), at the time of final reporting. Please highlight any changes from the original plans.

If no result has been achieved on a specific point, or in the event of unexpected delay(s), please provide detailed explanatory notes and indicate new planned completion date(s).

Please include any additional deliverables completed during the implementation of the project, that were not originally outlined in the BIFA Full Proposal.

Add rows as required.

a. Data

Details of datasets published and/or pending publication as an outcome of the project. The table below should be completed in the same way as in the BIFA Full Proposal but should include information and updates on the status of each dataset. **Please provide links in sources of verification.**

If the dataset is not yet published, please indicate this as "not published" and provide a detailed explanation, % of digitization and expected date of publication.

Add rows as required.

Title of dataset	Data type (checklist/occurrences/sampling event) [1]	Estimated number of records (specimens)	Status of dataset: Published / not published and % of digitization and expected date of publication	Data holding institution agreed to publish its data via GBIF.org (Yes/No)	Explanatory notes	Source(s) of verification: DOI or URL
Dataset titled "Flora of Sumatra	occurence	3,682 sheets of	*Published*	Yes	New dataset	https://doi.org/10.15468/ue

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[1] Dataset classes: http://www.gbif.org/publishing-data/summary#datasetclasses

Title of dataset	Data type (checklist/occurrences/sampling event) [1]	Estimated number of records (specimens)	Status of dataset: Published / not published and % of digitization and expected date of publication	Data holding institution agreed to publish its data via GBIF.org (Yes/No)	Explanatory notes	Source(s) of verification: DOI or URL
: Vascular plant collection from Batang Toru Forest North Sumatra deposited in ANDA Herbarium		specimens				yn
Flora Sumatra: Digitizing and data basing specimens of the Sumatran Flora deposited at Herbarium Universitas Andalas (ANDA)-Part 2	occurence	17,600 sheets of specimens	*Published*	Yes	New dataset	https://doi.org/10.15468/55 ew

b. Other deliverables

Describe other deliverables (e.g. publication of data papers, analysis, reports etc.) produced by the project. In the event of unexpected delay(s), please provide detailed explanatory notes and indicate if the deliverable(s) are to be produced post-project, and if so, indicate expected completion date(s).

Please provide links in the sources of verification. Attachments should be provided in the Annex.

Name and type of deliverable	Status of deliverable: Completed? Yes / No (inc. % complete)	Explanatory notes	Source(s) of verification
E-books publishing on the checklist of the Sumatran flora diversity	Not published yet (60% complete)	Expected to be published in September 2020	Annex 6
Dissemination of the project outcomes	Not published yet (60% complete)	Expected to be completed in September 2020	Annex 5
Build a database offline	complete	Database program used open-source sofware relational database management system.	Annex 2

Events organized as part of the project

Please indicate the status of the events as outlined in the BIFA Full Proposal (section 4.6), at the time of final reporting.

*The table below should be completed in the same way as in the BIFA Full Proposal, but should include information and updates on the status of each event. **Please provide links to any documents or web pages documenting the event(s) in the sources of verification. Attachments should be provided in the Annex.***

In the event of unexpected delay(s), please provide detailed explanatory notes and indicate new planned completion date(s).

Please include any additional events organized as part of the project that were not originally outlined in the BIFA Full Proposal.

Add rows as required.

Event title	Organizing institution	Date held / expected dates	Number of participants	Explanatory notes	Source(s) of verification
Workshop for volunteer	Herbarium ANDA	September 2019	30 persons	Complete	Annex 3
Volunteers recruitments	Herbarium ANDA	May 2019	15 persons	Complete	Annex 4
Capturing specimen images	Herbarium ANDA	May-October 2019	15 persons	Complete	Annex 7
Capturing specimen data	Herbarium ANDA	May 2019- January 2020	15 persons	Complete	Annex 7
Data cleaning	Herbarium ANDA	February 2020	2 persons	complete	-

Event title	Organizing institution	Date held / expected dates	Number of participants	Explanatory notes	Source(s) of verification
Data publishing	Herbarium ANDA	October 2019 and April 2020	2 persons	complete	Dataset link publisher: https://www.gbif.org/publisher/43f4255c-f218-4a17-857a-ba3ac8456191.
Writing data paper	Herbarium ANDA	60% complete	5 person	Abstract scientific paper	Annex 8
Creating an offline database	Herbarium ANDA & stakeholder	April 2020	5 person	complete	Annex 2

Calendar of activities

The calendar should be completed in the same way as in the BIFA Full Proposal (section 4.7) but should also clearly indicate and include any changes (e.g. use of colour-coding to indicate expected changes and/or delays). Please provide explanations for any changes in the "Notes" column. Please provide general comments on the calendar of your activities in the 'General comments on project implementation' section.

Activity	2019							2020				Notes
	M	J	J	A	S	O	N	D	J	F	M	A	

BIFA4 – Data mobilization grant

 GBIF

Activity	2019								2020				Notes
	M	J	J	A	S	O	N	D	J	F	M	A	
Preparation and national stakeholders meeting			X										Delayed to fit InaBIF timeframe.
Open recruitment for volunteers		X											on schedule
Mandatory attendance of a project team member to the BIFA Capacity Enhancement Workshop (expenses for attending the workshop are covered by the BIFA programme)			X										on schedue
Deadline for mid-term report – 31 October 2019 Mandatory milestones attached to the mid-term report: - Gain certification at BIFA Capacity Enhancement Workshop - At least one dataset has been published to GBIF.org						X							on schedue
Workshop for volunteers					X								Delayed following campus activities.
Capturing specimen images	X	X	X	X	X	X							on schedue
Capturing specimen data	X	X	X	X	X	X							on schedue
Data cleaning						X	X						Delayed to wait for data capture to finish.
Data publishing						X						X	on schedue
Creating an offline database											X	X	Delayed to wait for the verification of species identification.
Writing data papers										X	X		Delayed (70% complete).

Activity	2019								2020				Notes
	M	J	J	A	S	O	N	D	J	F	M	A	
Deadline for final reporting – 30 April 2020 Mandatory milestones attached to the final report: - All deliverables have been produced - Sustainability and next steps have been documented												X	All dataset has published. Other deliverables 80% complete

a. General comments on project implementation

(Max. 200 words)

[Overall, we have completed all the activities. We kept coordinating with InaBIF, particularly in using IPT to publish our second dataset. We also kept our contact with plant experts to verify species nomenclature. Although several activities were delayed, it was because we were trying to improve its effectiveness, to fit with campus activities, and because of covid-19 pandemic. Activities involving public transports and mass gathering, such as seminar and meeting with stakeholder were unable to be conducted.]

Project communications and visibility

Describe the way the results of your project have been and will continue to be communicated and shared with the project stakeholders and broader GBIF community.

Please also review the page describing your project available from http://www.gbif.org/programme/bifa and highlight any additional documents, events, news items or links that you would like to add to your page and provide links/attachments in the Annex.

(Max. 300 words)

[The specimens deposited at the Herbarium ANDA have been collected for over 35 years from the regions on Sumatra, and we wanted the data to be accessible worldwide. We paid attention to partners' and users' feedback to improve the benefit of the data accessibility. In this project, we digitized over 20,000 sheets of specimens, accompanying by photographs for each specimen shared on GBIF website.

We were still developing a simple offline database that capable of storing more data with simpler data capturing process. We kept communicating with our herbarium partners and other herbaria to improve the quality of the offline database. Moreover, we also kept our collaboration with plant experts for the validation and verification of species identification. We will keep conducting data mobilization for the rest of the specimens deposited at the Herbarium ANDA and will incorporate it in our lecture at Andalas University.

For promotion, we will publish this project in scientific journals, and we will attend scientific seminars, such as an upcoming Indonesian Plant Taxonomist Asociation (PTTI) Symposium in Pekanbaru, Sumatra.]

Monitoring, evaluation and lessons learned

Please indicate the results of the monitoring and evaluation plans, as outlined in your BIFA Full Proposal (section 4.9), at the time of final reporting.

Ideally this section should also include the following:

- *An evaluation of the project activities and their outputs/deliverables*
- *An assessment of the overall outcomes, impacts of the project and how it contributes to the overall objective of the BIFA programme*
- *Comments on the project implementation and completion, and its efficiency and effectiveness, strength and weaknesses etc.*
- *Any feedback on the project's relevance from the partners and stakeholders*
- *Indications and reasons for any changes which have been made to the project's original plans, and actions to follow-up*
- *Areas of success to build on, after the project's implementation period and best practices that could be useful for the community*
- *Main lessons from the project experience that could be applied in other contexts*
- *Conclusions from your experience during the implementation of the project and recommentations for the GBIF Secretariat or the community to reinforce the success of the project*

(Max. 400 words)

[The project activity and output in general, has been completed according to our plans. Our main outcomes were two datasets that we completed by the end of the project, and it surpassed the planned numbers of sheets of specimens. The first dataset was 3,682 sheets of specimens from the target of 3,000 sheets of specimens, and the second dataset was 17,600 sheets of specimens from the target of 17,000 sheets of specimens. Other deliverables, such as offline database were completed according to the target. E-book, on the other hand, was still in draft, and conference presentation was still unable to be conducted. The conference presentation was delayed because all conferences were delayed due to covid-19. Other issues during the project was the delay of receiving the verification of species identification from plant experts. This, however, did not delay the publication of the datasets. We kept updating the species identification after publication.

We hope this project will help to reduce the gaps of biodiversity data from Asia. By the end of this project, the Herbarium ANDA had mobilized over 34,000 sheets of specimens from BIFA3 and BIFA4 project. All the specimens were available in digital format on GBIF website. During the project, we have received appreciation from our partners and stakeholders involved in the project. The datasets we produced from this project was the only information on the floras from Sumatra that were available on GBIF website.

During this project, our team have received invaluable experience from several activities we conducted for the project. Our team learned the mobilization and digitalization of biodiversity data using standardized process, including data publication. The project has also improved our team management skills to ensure each team member met their work target. We were proud that after publishing the database, we received positive feedback from stakeholders.

During the activities, we found inconsistency of the data entry, such as inconsistency on the labels. For example, the same localities were recorded under different name, and different data format for the dates and the coordinates. This was because we had volunteers with different level of experience. The issues added complexity for the data cleaning. To solve them, at the end of the project, we created a data entry form for the offline database aimed to simplify data entry process and improve consistency for the next data entry.]

Sustainability plans

Please provide a description of how the partners involved will build on the results of this project in their future work. This could include future collaborative activities, such as plans to complete any unfinished project activities and how the future impact of the project could be monitored and/or measured.

(Max. 200 words).

[The focus on this project was to reduce the gaps of biodiversity data in the Asian region. Indonesia is a hotspot biodiversity country in the world with limited information on species taxonomy, adding complexity for publishing biodiversity data. We, however, hoped that this project would help to reduce the gaps of the biodiversity data. After we finished this project, we will continue the data digitalization for the remaining specimens, and we will adopt the data management and digitalization as a part of materials for a class in the department. We will also continue to promote the published data through scientific meeting, and to keep communication and collaboration with plant experts to validate and verify the species identification.]

Annex – Additional sources of verification

Sources of verification are for example links to relevant digital documents, news/newsletters, brochures, workshop related documents, pictures, etc.

[Annex 1. Photographs of BIFA Capacity Enhancement Workshop

https://drive.google.com/drive/folders/10iN8HiUaSm54olfQZ7nR2cBIexdyn1pH

Annex 2. Offline database
https://drive.google.com/open?id=18eOPDojBwDBncrh5j89QA_bxRBUlmSkx

Annex 3. List of attendees, workshop materials, and documentation.

https://drive.google.com/open?id=1i6TzsloXf7TQotfP43XzBRWm-SIw5VCJ

Annex 4. List of teamwork BIFA4_23.

https://drive.google.com/open?id=1OY46uKZbchj7qikbyUZXaj243gecKNRX

Annex 5. Abstract for conference presentation

https://drive.google.com/drive/folders/13T8UfRVWyu_NSfpn8tXMgCWZoNNvu6s9

Annex 6. The book draft.

https://drive.google.com/drive/folders/1M_ztw5uTW_7swxN4--DjkQoBRvL00APg?
usp=sharing

 Annex 7. Photographs of data capture activities.

https://drive.google.com/open?id=1Rxg5-O7AlHtf3Y5-Khf48MZDbpaYtWTy

Annex 8. Abstract of scientific paper

https://docs.google.com/document/d/1ksItG66J-OeCrYDzpySTyNvwADUfda6vTZoU4z4-4BU/edit?usp=sharing]