

Darwin Initiative Capability & Capacity Annual Report

To be completed with reference to the “Project Reporting Information Note”:
(<https://www.darwininitiative.org.uk/resources-for-projects/information-notes-learning-notes-briefing-papers-and-reviews/>).

It is expected that this report will be a **maximum of 20 pages** in length, excluding annexes)

Submission Deadline: 30th April 2023

Submit to: BCF-Reports@niras.com including your project ref in the subject line

Darwin Initiative Project Information

Project reference	DARCC006 Darwin Initiative Capability & Capacity
Project title	Strengthening collaborative tree seed supply systems for restoration in Asia
Country/ies	Bangladesh, India, Indonesia, Philippines
Lead Partner	Bioversity International
Project partner(s)	Bangladesh Forest Department Institute of Forest Genetics and Tree Breeding (IFGTB), India National Research and Innovation Agency (BRIN), Indonesia University of the Philippines Los Banos (UPLB) Royal Botanic Garden of Edinburgh (RBGE)
Darwin Initiative grant value	£200,000
Start/end dates of project	1 April 2022 to 31 March 2024
Reporting period (e.g. Apr 2022 – Mar 2023) and number (e.g. Annual Report 1, 2, 3)	1 April 2022 to 31 March 2023, Annual Report 1
Project Leader name	Riina Jalonen
Project website/blog/social media	https://www.apforgen.org/initiatives/strengthening-seed-supply
Report author(s) and date	Riina Jalonen, Tobias Fremout, Md Zahidur Rahman Miah, Tauhidur Rahaman, Rekha Warriar, Vivi Yuskianti, Enrique Tolentino jr, Cristino Tiburan jr., Peter Wilkie 28 April 2023

1. Project summary

The multi-billion dollar investments in forest and landscape restoration (FLR) provide an unparalleled opportunity to restore and simultaneously conserve native, threatened tree species while enhancing ecosystem services and supporting local livelihoods. However, large-scale planting of native tropical tree species for other than purely commercial purposes is a recent phenomenon, and several institutional and technical factors constrain their wider use in FLR programmes, including (i) lack of native tree seed to meet the ambitious FLR targets, (ii) lack of information about effective seed sourcing strategies under changing climate, (iii) lack of

information about seed quality and origin, and (iv) lack of integration of informal seed suppliers in supply chains to meet national FLR targets and support livelihood opportunities ([Bosshard et al. 2021](#)).

The remaining natural populations in forests, woodlands and farms that constitute the only available seed sources for most native tropical species are poorly documented, while also threatened by continued forest loss and degradation. The problem is aggravated by the fact that seed markets are underdeveloped and many FLR projects source seed on their own. Therefore, an overview of seed demand and supply for native species is lacking. Such an overview would help assess the adequacy and conservation status of seed sources for diverse environmental contexts and FLR objectives, and ensure that seed collection relying on natural sources is sustainable.

At the same time, the importance of species genetic diversity and origin of native seed for restoration success remains poorly understood by FLR practitioners. Information about it is typically not documented and passed on in seed value chains to help practitioners select seed for their project needs. The choice of species and seed often depends on what happens to be available at the time of planting, instead of what would best suit the FLR objectives and site conditions and guarantee population viability.

These two constraints are intertwined: when seed quality is neglected, the need to conserve and sustainably manage natural seed sources also end up overlooked. Importantly, the lack of information about seed origin makes it difficult to help small seed producers, forest-dependent communities and seed source owners participate in seed value chains and channel resources and capacity development to them, so as to support income generation and incentivise sustainable forest management.

We work with forestry authorities, FLR implementers and forest-dependent communities in Bangladesh, India, Indonesia and the Philippines to strengthen institutional and technical capacities, so that FLR projects are linked to quality seed sources and local seed producers to customers so as to support local livelihoods and sustainable forest management. The project was designed and the proposal written collaboratively between all formal partners, based on a joint desk study that highlighted seed availability challenges for restoration in project countries ([Bosshard et al. 2021](#)).

2. Project stakeholders/ partners

Partner involvement in activities

The project team has held approximately bi-monthly team meetings online and three planning and review workshops, to together review progress, share experiences in implementation and plan upcoming activities:

- [Inception workshop](#) (11-12 May 2022, online)
- [Training workshop and implementation planning workshop](#) (28 Nov to 2 Dec 2022, Coimbatore, India, hosted by project partner IFGTB)
- Year 1 review meeting (13 March 2023, Malaysia in conjunction with the regional workshop of the Asia Pacific Forest Genetic Resources Programme which the project partners also attended)

Achievements, lessons, challenges

Since project approval, the in-country partners have selected and established collaboration with key organisations and units responsible for tree seed production, forest restoration and forest biodiversity conservation in their countries as follows:

- Bangladesh: Bangladesh Forest Department: Botanical Garden, Resource Information System Unit, Management Plan Unit, and FLR Project implementing Forest Divisions to ensure seed source identification, mapping, conservation and supply chain development for FLR. A strong collaborative platform will be created with Bangladesh Forest Research Institute, National Herbarium and Different Academia.
- India: Tamil Nadu and Kerala Forest Departments

- Indonesia: The Directorate of Forest Tree Seed (DFTS) at the Ministry of Environment and Forestry
- The Philippines: Mindanao Tree Seed Centre

In addition, the project team has established regular contact with the OECD Forest Seed and Plant Scheme, with representatives joining several project meetings online, and sharing expertise on international standards and best practices in documentation of tree seed sources and seed collections.

The project team has faced major delays in signing collaborative agreements in 3 of 4 countries (all except the Philippines). Subcontracting was expected to take some time and the project work plan was prepared in such a way that activities in the first 6-9 months were funded directly by the lead partner until contracts could be signed. The negotiations on the contract terms (flowing down from the main agreement) were, however, prolonged beyond this time. This delayed the implementation of some activities (especially validation workshops, Activity 2.1., and the establishment of the project-wide M&E Advisory Group). At the same time, the experience developed capacities of in-country teams to interpret and negotiate contract terms of international projects, and stimulated broader agreements for long-term institutional collaborations; in 2 of the 3 countries facing delays, the lead partner was invited to sign a Memorandum of Understanding with the respective government institutions. We learned that contracting universities (as in the Philippines) is generally easier than contracting government institutions, yet formal agreements with government organisations facilitate collaborations with those organisations which are better able than universities to adopt and implement project results and recommendations in practice.

It was agreed that the Advisory Group on Monitoring and Evaluation will be established once all sub-contracts have been signed, to follow proper institutional processes in each partner organisation. This was, therefore, postponed to Year 2.

Participant selection

One training was organised in Year 1 on analysing gaps in seed source availability (Activity 1.4). Training participants were nominated by the national implementing partners, based on agreed selection criteria (workshop concept note, July 2022):

1. At least basic knowledge of R programming. Experience with spatial analysis in R is a plus, but not a requirement.
2. At least basic knowledge of GIS. Experience with species distribution modelling is a plus, but not a requirement.
3. Knowledge of local flora and biogeography
4. Where possible, partners are requested to nominate both male and female participants to the training (project-level target is to have >30% of female participants).

Participants for Year 2 activities on capacity training for restoration practitioners (Activity 3.3) and collaborative seed sourcing (Activities 4.1 and 4.2) will be selected based on the results of the gap analysis on seed source availability (geographical focus), capacity needs assessments (Activity 3.2), and gender equity and social inclusion targets (at least 30% women).

3. Project progress

3.1 Progress in carrying out project Activities

1.1 Develop methodology for gap analysis on tree seed sources

Completed – Methodology was discussed and approved at the project’s inception workshop (see description in [workshop report](#), p.6).

1.2 Develop seed zone maps for current and future climates in target countries and validate them with experts

Completed – Seed zone maps were developed following the methodology of [Fremout et al. \(2021\)](#) with country-specific adjustments and validation as follows:

Bangladesh: In total 9 experts contributed to validating the seed zone map, from the Planning unit and the Resource Information Management System (RIMS) of the Bangladesh Forest Department and from the Forest Inventory Division of the Bangladesh Forest Research Institution. Seed zones were assigned to correspond to the smallest administrative units, union councils, for easier implementation.

India: The seed zone map covers the 4 southernmost states of Andhra Pradesh, Karnataka, Kerala and Tamil Nadu. The maps were validated by experts from the IFGTB, Coimbatore; Tamil Nadu Forest Department; Kerala Forest Department; and the Institute of Wood Science and Technology.

Indonesia: The map was developed by dividing the existing seed zones of the generic National Seed Zone Map (*Peta Zona Benih Tanaman Hutan Indonesia*, issued by the Ministry of Environment and Forestry), into environmental clusters to obtain the dynamic seed source map that can be projected to future climate conditions. The resulting map was validated by four experts from the National Research and Innovation Agency, the Directorate of Forest Tree Seed, and IPB University

Philippines: The seed zone map for Mindanao was overlaid with forest cover and soils maps. The forest cover map is mainly sourced from the National Mapping and Resources Information Authority (NAMRIA) while the soils map is acquired from the Bureau of Soil and Water Management (BSWM) of the Department of Agriculture. The seed zone map was selected based on correspondence with the forest cover and soil maps and geographic continuity of the seed zones.

Final maps are available on the project website at:
<https://www.apforgen.org/initiatives/strengthening-seed-supply/>

1.3 Identify data sources and access options on species distributions, seed sources and land uses

Completed – Data templates were developed with expert guidance from the Royal Botanical Garden of Edinburgh and the OECD Forest Seed and Plant Scheme (see [inception workshop](#) report, p. 9). In total 21 species were selected, including 7 threatened and 5 *Not Assessed* on IUCN Red List, and 2 species listed on CITES Appendix II. Data was compiled from the Global Biodiversity Information Facility (GBIF), published research reports and articles, herbaria records of RBGE, and from the following local and national databases and data sources (Table 1):

Bangladesh: National Forest Inventory (NFI) sample plots.

India: Fischer Herbarium, field data, and Research Reports of the IFGTB.

Indonesia: Database of the Directorate of Forest Tree Seed (DFTS) in the Ministry of Environment and Forestry; Herbarium Bogoriense; Herbarium Botani Hutan, Bogor; and Herbarium Wanariset Kalimantan; field data and research reports.

Philippines: Mindanao Tree Seed Center of the Ecosystem Research and Development Bureau (ERDB), the Regional Field Offices of the Department of Environment and Natural Resources (DENR), project reports, and a project on *Almaciga* (*Agathis philippinensis*) by the DOST-PCAARRD (Department of Science and Technology).

Table 1. Data points obtained per target species and country.

Species	Common name	Conservation status	Country	Occurrence points	Seed sources
<i>Aglaia chittagonga</i>	Pitraj/Thitpasing	Vulnerable	Bangladesh	38	-
<i>Aglaia spectabilis</i>	Rongi-rata / Sundari amoor	Least Concern	Bangladesh	38	-
<i>Artocarpus chama</i>	Chapalish	Not assessed	Bangladesh	37	-
<i>Schima wallichii</i>	Kanak/ Bonak/ Mon-champa	Least Concern	Bangladesh	30	-
<i>Stereospermum tetragonum</i>	Dharmara/ Pahari-awal	Not assessed	Bangladesh	37	-
<i>Aquilaria malaccensis</i> *	Agarwood (Gaharu)	Critically endangered	Indonesia	126	27
<i>Pinus merkusii</i>	Pinus	Vulnerable	Indonesia	95	27
<i>Falcataria falcata</i>	Sengon	Least concern	Indonesia	38	33
<i>Neolamarckia cadamba</i>	Jabon putih	Not assessed	Indonesia	44	4
<i>Magnolia sumatrana</i>	Manglid	Not assessed	Indonesia	85	-
<i>Pterocarpus indicus</i>	Narra	Endangered	Philippines	509	171
<i>Cinnamomum mercadoi</i>	Kalingag, Mindanao cinnamon	Least Concern	Philippines	135	4
<i>Agathis dammara</i> (syn. <i>A philippinensis</i>)	Amboina pine, Almaciga	Vulnerable	Philippines	283	37
<i>Shorea contorta</i>	White Lauan	Least Concern	Philippines	834	292
<i>Eucalyptus deglupta</i>	Bagras	Vulnerable	Philippines	162	27
<i>Dalbergia latifolia</i> *	Indian rosewood	Vulnerable	India	183	-
<i>Terminalia chebula</i>	Black myrobalan	Least Concern	India	213	-
<i>Terminalia bellirica</i>	Baheda	Least Concern	India	133	-
<i>Xylia xylocarpa</i>	Burma ironwood	Least Concern	India	139	-
<i>Tectona grandis</i>	Teak	Not assessed	India	229	-
<i>Pterocarpus marsupium</i>	Indian kino	Near threatened	India	104	-

* included in CITES Appendix II

1.4 Train and mentor 3 experts per country to implement gap analysis (Spatial analysis, R statistics, data on forest cover and land tenure) (1 regional workshop, 15 participants)

Completed – the training was organized from 28 November to 2 December 2022 in Coimbatore, India, hosted by project partner IFGTB ([report](#)). Three experts from each country participated in the training (total 13, 46% women). The target for >30% of female participants was met for all countries except for the Philippines, where the identified female candidate did not have a passport and hence could not travel internationally. The post-training survey showed significant improvement in participants' perceived abilities to carry out species distribution modeling and seed source analysis (Table 2, [Annex 4.1](#))

Table 2. “How well could you...?” Training participants’ perception of their abilities before and after the training workshop. Mode values are shown in bold font.

Task	Time	Self-reported ability level, % of participants				
		Not at all	A little	Moderately	Well	Very well
Explain basic concepts of species distribution modeling	before	33	50	17	-	-
	after	-	-	58	42	-
Explain data needs for species distribution modeling	before	33	25	42	-	-
	after	-	-	58	42	-
Use programming languages (e.g. R programming) to compile and clean species data	before	75	25	-	-	-
	after	-	33	42	17	8
Model species distributions and generate distribution maps	before	50	42	8	-	-
	after	-	25	50	25	-
Describe how model parameters can be adjusted to improve model predictions	before	83	8	8	-	-
	after	-	27	36	27	9
Explain data needs and methods for analysing gaps in the availability of seed sources	before	67	33	-	-	-
	after	-	17	67	8	8
Analyse gaps in the availability of seed sources through spatial analysis	before	75	25	-	-	-
	after	-	33	50	17	-

Before and after the workshop, the experts were mentored in compiling occurrence data for the target species through regular review meetings (30.8., 19.9., 18.10., 16.11. and 11.1.) and provision of feedback on data compiled so far.

2.1 Validate results of the gap analysis with forestry authorities and other stakeholders

Partially completed – workshop for the Philippines was conducted in Bislig, Surigao del Sur from February 28 to March 1 (Figure 1). Validation was delayed in Bangladesh, India and Indonesia due to delays in signing the contracts, which prevented formal validation meetings with government stakeholders.



Figure 1. Participants of validation workshop in the Philippines; Surigao del Sur, February 28 to March 1, 2023.

2.2 Evaluate and improve existing databases on seed sources in collaboration with stakeholders (Y1 Q4 to Y2 Q1)

Completed for planned Y1 tasks – the following existing databases and improvement options were identified in each country:

Bangladesh: Staff at Resource Information Management System (RIMS) unit of Bangladesh Forest Department have developed an online platform for visualizing and analysing National Forest Inventory data, using R programming. The platform can be updated to include a seed information database with information on seed sources, seed collection and seed availability from suppliers. The database can be shared with seed producers, FLR implementers and other users.

India: IFGTB has developed a Mobile App on “Forest Seed Science and Technology” in which seed handling techniques and useful information for 100 forest tree species, including plantation species, tree-born oil seeds, non-timber forest product species, medicinal species; rare, endangered and threatened species; and Shola species. The application currently includes information such as seed collection techniques, processing of seeds, storage, testing, breaking of dormancy, and seed treatment methods to enhance germination of the respective species, but no information on seed sources. The App will be updated with information on the availability of seed sources, their locations, the contacts and mode of procurement.

Indonesia: The national database which contains all the information regarding the certified seed sources of many FLR tree species in Indonesia is still paper-based, not easily accessible or updated and prone to data gaps and overlaps. A prototype of a forest tree seeds information system (online database) was created through this project. This information system will help digitize seed source data, integrate information on seed sources and seed distribution, seed administration (documentation) and supervision (minimizing illegal seed). The new digital information system will be tested in West Java and will subsequently be refined and scaled for nationwide use.

The Philippines: The Mindanao Forest Tree Seed Center (MFTSC) Seed Information Database System is a standalone database system developed through Sublime text, Xampp for server and MySQL database. This database is a collection of various information from seed collection, seed record registry, and seed disposition from the center. It, however, lacks information on seed zones. Based on consultations with MFTSC leadership, there is need for a centralized data repository including species occurrence data and seed sources to be established by the Department of Environment and Natural Resources (DENR), covering all regions and agencies. The repository would allow identifying gaps and so consolidating and improving information on seed availability. It can also ensure data integrity and security, increase scalability, and improve collaboration among regional offices and even partner agencies which currently each operate their own systems. Through the project, we will work with MFTSC to update their database with information on seed zones, and advocate the database as a model for establishing a centralised information system.

2.3 Make analysis methods and results publicly and freely available (YEAR 2)

This activity is scheduled for Year 2 of the project.

3.1 Identify target districts / regions and training participants based on the gap analysis

Completed – The following target districts and training participants (organisations/types) were identified:

Bangladesh: Target areas are tentatively Chittagong and Sylhet. The selection will be confirmed in a consultation with policy makers once the MOU is signed to formalize project collaboration.

India: The focus will be in Tamil Nadu where large number of private nurseries exist to supply forestry saplings. Targeted participants will be members of the Indian Nurserymen Association (INA), and from Coimbatore and Cuddalore districts and Pondicherry where key nurseries involved in seed and seedling supply are located. The Forest Department also has central nurseries whose ground staff will be involved in the trainings.

Indonesia: Target area is the province of West Java because the tree seed supply system, including human resources and infrastructure are more established than in other regions in Indonesia and it is easier to pilot and test quality considerations and new linkages between seed suppliers and customers. The targeted training participants will be staff from the central institutions (DFTS) and the Regional Technical Implementation Unit (UPTD) in West Java, practitioners, seed source managers, and seed suppliers and other related parties that involved in the supply of seeds and seedlings in West Java.

The Philippines: Northern Mindanao, Caraga, Davao, Soccsksargen (South Cotabato, Cotabato, Sultan Kudarat Sarangani and General Santos) and Bangsamoro regions. Targeted training participants will be DENR staff at different levels involved in implementing the National Greening Program and selected seed collectors and nursery operators in target regions.

3.2 Assess current capacities and constraints of FLR implementers in sourcing quality native tree seed from local communities and smallholders

Partially completed – The needs assessment was designed by the lead partner and revised based on feedback from in-country partners. As of 31 March 2023, the assessment had been implemented as follows:

Bangladesh: Assessment was piloted among staff of Bangladesh Forestry Department, Bangladesh Forest Research Institute and one private nursery. Implementation among local seed collectors and nursery operators requires field travel and was delayed due to the pending MOU.

India: Some 60 seed collectors and nursery operators in target regions have been identified for needs assessment and piloted as a desk survey. Implementation among private seed collectors and nursery operators requires field travel and was delayed due to the pending MOU.

Indonesia: The survey was piloted among 30 staff of the Directorate of Forest Tree Seed and the Regional Technical Implementation Units. Field visits were also conducted in West Java to potential seed sources as well as permanent and local communities' nurseries in Bogor, Sumedang and Tasikmalaya districts to observe current seed production practices (Figure 2). Results are being analysed as of April 2023.



Figure 2. Left: Cikahuripan nursery in Sumedang, West Java, managed by a group of 10 farmers. Right: Seed source of *Manglietia glauca* managed by the farmer group. The species is one of the project's pilot species in Indonesia.

The Philippines: In total 225 supply chain actors were surveyed, consisting of 11 seed source managers, 53 seed and seedling suppliers, and 161 end-users who collect, produce or purchase tree seeds or seedlings for their own purposes. Results are being analysed as of April 2023.

3.3 Organise one training in each target district / region on sourcing quality seed from communities and seed source conservation, based on the capacity needs assessment (YEAR 2)

Ahead of schedule – Although this activity is planned for Year 2, one training workshop was already organized in Year 1 in Indonesia, in Jatinangor, West Java, on 8-9 March 2023. The workshop was attended by 30 participants including seed producers, FLR implementers, forestry extension workers as well as staff from central and regional seed agencies. Invited speakers from central and regional agencies explained about the tree seed policies to support forest and land rehabilitation at the national and regional levels. Speakers included Nurul Iftitah, the Director of Forest Tree Seed (DFTS) in the Ministry of Environment and Forestry; Dr. Anang Setiawan Achmadi, the Head of Research Center for Ecology and Ethnobiology, National Research and Innovation Agency; Dr. Didit Ardia Pancapana, the Head of Forestry Service of West Java, and Dr. Ir. Dede Mahmiludin, the Head of the Regional Technical Implementation Unit (UPTD) of West Java. Three other speakers from IPB University and the National Research and Innovation Agency also presented about characteristics of quality seeds, selection of plus trees, and seed zone maps. An introduction and short training to the information system for forest tree seeds (online database) was given on the second day of the workshop. The presentations and discussions at the workshop demonstrated the support and readiness to cooperate from stakeholders at the central (national) and regional levels as well as its supply chain actors to strengthen the tree seed system in Indonesia especially in West Java. Follow up trainings for specific stakeholders' needs will be organised in Year 2 based on the capacity needs assessment results.

4.1 Guide FLR implementers (training participants) in developing collaborative work plans for seed collection and production with male and female community members (YEAR 2)

4.2 Identify and address priority needs for seed funding, using participatory and gender-responsive approaches (YEAR 2)

4.3 Document and share lessons learned (YEAR 2)

These activities under Output 4 are scheduled for Year 2 of the project.

3.2 Progress towards project Outputs

Output 1 Identified gaps in seed source availability for native species in four countries

- Availability of gap analysis methodology (*report on methodology*)

Baseline: Methodology did not exist

Change to date and evidence: Methodology was developed and agreed by project partners, and tested and applied in each country (see Output 2)

- Number of experts trained and skilled in gap analysis methods, by country and gender (target: 12, >30% women) (*Pre-and post-training assessments, number of species analysed by experts*)

Baseline: No previous training as the methodology is new

Change to date and evidence: 13 people (including 6 women, 46%) trained from 4 countries ([training workshop report, Annex 4.1 on post-training survey results](#))

- Availability of species distribution, seed zone and seed source maps (target: 20 native species) (*Data repositories*)

Baseline: Seed zone map existed only in Indonesia, published in 2012; however, it resembled a forest type map with very broad zones spanning multiple islands, and was not implemented in practice. To our knowledge, no previous species distribution maps based on environmental niche modeling existed for 15 of the 21 selected target species. For the remaining 6 species, region-wide maps existed (Gaisberger et al. 2022) but at coarser resolution (approx. 5 x 5 km while new maps are approx. 1 x 1 km) and built with much fewer in-country data points that significantly improve the accuracy of predictions. Maps of seed sources did not exist for any target species or country.

Change to date and evidence:

Dynamic seed zone maps are available for [Bangladesh](#), [all major Indonesian islands](#), [South India](#) (Kerala, Karnataka, Tamil Nadu and Andhra Pradesh) and the [island of Mindanao in the Philippines](#). Seed zone maps were not prepared for the rest of India or Philippines due to the high diversity of environmental conditions, making validation difficult within the short project period.

Distribution maps and seed source maps are available for [21 species \(Annex 4.2\)](#). In Year 2, the maps and corresponding data layers will be integrated in national databases (see Activity 2.2).

Output 2 Improved access to information about seed sources and seed origins by forestry authorities and FLR implementers

- Validated priority maps and databases on the availability of seed sources (*Data and publication repositories*)

Baseline: To our knowledge, data on gaps in seed source availability or priority maps for seed source establishment did not exist in any country.

Change to date and evidence: Data gaps in seed source availability by seed zone were identified and priority maps created for establishing seed sources for 21 native species across the 4 project countries (Table 3, Figure 3, maps for all species available in [Annex 4.2](#)).

- Number and type of recommendations made and implemented for improving data management on seed sources and seed origins (*Records of stakeholder consultations and feedback; Database structures and content before and after interventions, Financial records on the uses of seed funding*) **(YEAR 2)**

Baseline: Databases on seed sources do not exist in India and Bangladesh. Paper-based information on seed sources exist in Indonesia, maintained by the Directorate of Forest Tree Seed (Figure 4). In the annual coordination meeting of various tree seed agencies under the Ministry of Environment and Forestry in June 2022, it was recommended to create an online database that can be accessed and updated easily by various related

parties and avoid overlapping data. In the Philippines, there is no centralised database on seed sources. Individual organisations such as different DENR offices and the Mindanao Forest Tree Seed Center maintain some data on seed sources, but it is fragmented and difficult to access.

Change to date and evidence: The indicator is scheduled for Year 2. Recommendations were identified in Year 1 through review of existing databases (all countries) and stakeholder workshops in Indonesia and the Philippines. Details are reported under *Activity 2.2* in the previous section.

- Manual on gap analysis methodology and online catalogues on seed sources **(YEAR 2)**

This indicator is scheduled for Year 2 of the project.

Table 3. Results of the gap analysis on seed source availability by seed zones.

Species	Country	Area	Seed zones within species distribution	Seed zones without documented seed sources	
				Number	%
<i>Aglaia chittagonga</i>			20	20	100
<i>Aglaia spectabilis</i>			20	20	100
<i>Artocarpus chama</i>	Bangladesh	Country-wide	10	10	100
<i>Schima wallichii</i>			18	18	100
<i>Stereospermum tetragonum</i>			10	10	100
<i>Aquilaria malaccensis</i>			11	10	91
<i>Falcataria falcata</i>	Indonesia	Java	20	15	75
<i>Magnolia sumatrana</i>			17	17	100
<i>Neolamarckia cadamba</i>			18	18	100
<i>Pinus merkusii</i>			26	23	88
<i>Agathis dammara</i>			15	14	93
<i>Cinnamomum mercadoi</i>	Philippines	Mindanao	15	15	100
<i>Eucalyptus deglupta</i>			15	15	100
<i>Pterocarpus indicus</i>			15	11	73
<i>Shorea contorta</i>			15	15	100
<i>Dalbergia latifolia</i>		Andra	27	27	100
<i>Pterocarpus marsupium</i>	India	Pradesh,	30	30	100
<i>Tectona grandis</i>		Kerala,	29	29	100
<i>Terminalia chebula</i>		Karnataka,	30	30	100
<i>Xylia xylocarpa</i>		Tamil Nadu	30	30	100

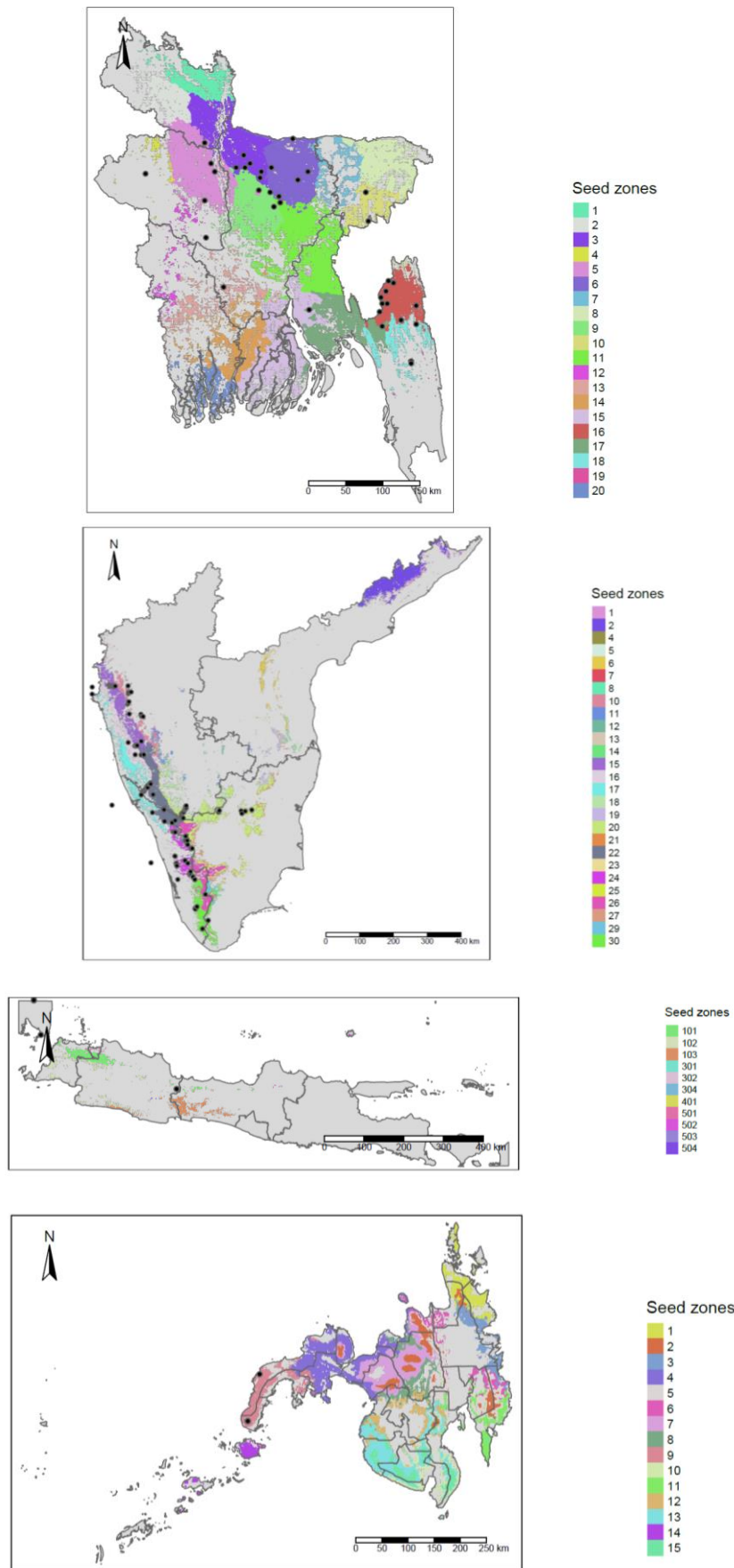




Figure 3. Examples of gap analysis results. Bangladesh: *Aglaia chittagonga*, India: *Dalbergia latifolia*, Indonesia: *Aquilaria malaccensis*, Philippines: *Agathis dammara*. Different colours show different seed zones within the species distribution. Dots show the known seed sources for Indonesia and the Philippines, and known occurrences of the species for Bangladesh and India where registered seed sources do not exist.

**DATA SUMBER BENIH TANAMAN HUTAN
BPTH BALI DAN NUSATENGGERA**

Gambar Tegakan



Gambar Sketsa Lokasi



Nomor Sumber Benih	: 53.20.039
Nama Sumber Benih	: Sengon Buto Bolo
Nama Botani	: <i>Enterlobium cyclocarpum</i>
Nama Daerah	: Sengon Buto
Lokasi	
Desa	: Eliode
Kecamatan	: Sabu Tengah
Kabupaten	: Sabu Raijua
Propinsi	: Nusa Tenggara Timur
Garis Lintang	: 10° 27' 38,96" - 10° 27' 41,15"
Garis Bujur	: 121° 55' 55,25" - 121° 55' 56,91"
Tinggi Tempat	: 80 m dpl.
Luas Areal	: 0,33 Ha
Ket. Lokasi	: Dari kantor Dinas PPPK Kab. Sabu Raijua melalui jalan aspal sekitar 15 Km ke Desa Eliode. Dari Desa Eliode ke lokasi sumber benih sekitar 1 Km melalui jalan tanah.
Pemilik	: Obed Nego Rata, Dusun I, Desa Eliode, Kec. Sabu Tengah, Kab. Sabu Raijua, Provinsi Nusa Tenggara Timur
Tahun Tanam	: 1999/2000
Puncak Berbunga	: Juni
Puncak Buah Masak	: Nopember
Produksi Benih	: 7,25 Kg
Kelas Sumber Benih	: Tegakan Benih Teridentifikasi
No. Sertifikat SB	: ST_31/BPTH.BNT/2014
Tgl Sertifikat SB	: 12 Mei 2014

Masa Berlaku	: 31 Mei 2019
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Species name

Location

Owner

Predicted seed production

Seed source certificate

Figure 4. Example of paper-based records of seed sources in Indonesia.

Output 3 Improved understanding of seed quality considerations and community roles in sourcing native tree seed among 40 FLR implementers in 4 countries

- Capacity needs assessment for improving the supply of and demand for quality seed among FLR implementers, forest-dependent communities and other stakeholders (target: 120 stakeholders) (*Reports and records of capacity Assessment*)

Baseline: A previous study by the project team members in 2020-2021 indicated gaps in institutional capacities in three of four project countries (India, Indonesia and the Philippines), for example seed and seedling shortages of native trees for meeting restoration targets, and lack of information on choosing site-adapted seed for current and changing environmental conditions ([Bosshard et al. 2021](#)). The study focused on national mechanisms based on a limited number of expert interviews and did not include roles of local actors in seed supply chains.

Change to date and evidence: Progress with capacity needs assessments is reported under Activity 3.2 in the previous section.

- Number of FLR implementers trained, by country and gender (target: 40, >30% women) (*Pre- and post-training assessments of knowledge, skills and attitudes*) (**YEAR 2**)

Baseline: We are not aware of any previous trainings in project countries that would have focused specifically on seed quality and seed supply chains for forest and landscape restoration.

Change to date and evidence: Related activities are scheduled for Year 2 of the project, but a first training workshop with 30 stakeholders (7% women) was conducted in Indonesia in March 2023. The workshop participants strongly supported the pilot information system on seed sources which was presented during the workshop. Trainings targeted at actors in

seed supply chains will be organised in Year 2, with additional efforts to attract female participants.

Output 4 Identified and tested approaches for connecting FLR implementers and local seed producers

- Number of new seed sources identified by species, seed zone and land tenure (target: 12 of which at least 8 on communal or smallholder lands) (*Records and maps of seed sources, inclusion in databases*) **(YEAR 2)**
- Number and type of activities carried out to link forest-dependent seed suppliers with FLR projects (by country and gender of participants; use of participatory approaches and gender equity and social inclusion in activity design and funding allocation) (*Field activity reports, participant interviews; Financial records of the uses of seed funding and related decision-making Processes*) **(YEAR 2)**
- Recommendations for improving community-based seed supply for FLR (*Reports of recommendations*) **(YEAR 2)**

This output is scheduled for Year 2 of the project.

3.3 Progress towards the project Outcome

FLR implementers in 4 countries use information on native tree seed demand and supply to improve seed availability and pilot opportunities to involve forest-dependent men and women in seed supply

- National or sub-national maps and databases on the availability of seed sources for native species (target: 4) (*Data repositories and evidence of use*) **(YEAR 2)**

Baseline: No known maps of the availability of seed sources in project countries. No seed zone maps, except for Indonesia (resembling a forest type map and not being implemented in practice)

Progress to date and evidence:

[National or subnational seed zone maps](https://www.apforigen.org/initiatives/strengthening-seed-supply) available in four countries: (<https://www.apforigen.org/initiatives/strengthening-seed-supply>)

Maps on seed sources by seed zone available for in total 21 species in 4 countries ([Annex 4.2](#)).

- Number of FLR implementers with improved seed sourcing strategies (target: 40) (*Pre-and post-training reports, FLR project workplans on seed sourcing*) **(YEAR 2)**
- Number of new seed sources identified by species, seed zone and land tenure (target: 12) **(YEAR 2)**
- Number of forest-dependent men and women identified as potential seed suppliers and receiving seed funding and skills training (target: 40, >30% women) (*Field activity reports, participant interviews, financial records*) **(YEAR 2)**

The project is likely to achieve the outcomes by the end of Year 2, provided that the pending formal partnership agreements can be completed early in Year 2.

3.4 Monitoring of assumptions

Assumption 1: Project partners obtain access to data on species distributions, seed sources and FLR projects in target landscapes

Comments: Assumption has held partially. Four threatened and two CITES-listed species that were initially selected had to be excluded due to lack of occurrence data for distribution modeling, indicating gaps in even basic data availability for many native and threatened species in the project countries. Also, some target species in the Philippines were found on indigenous people's territories, and access to these data sources is subject to detailed national regulations and lengthy processes on indigenous people's rights. Alternative data sources were sought to compensate for these data e.g. from published and grey literature. The purpose of the project was not to collect primary data on species given the limited time and resources. The identified gaps and improved analysis skills through training and mentoring help country partners to plan field surveys for threatened species and carry out spatial analysis on seed source availability.

Assumption 2: Staff with adequate background in data analysis are available for training and mentoring

Comments: Assumption has largely held. In each country team, at least one expert with good R programming and spatial analysis skills was identified and attended the training workshop. In some countries, selection of participants was somewhat affected by hierarchy norms within the institutions and lack of travel documents. Training participants worked in country teams to benefit from each others' experience. Each country team was able to produce data and maps on seed source availability by species. Participants who could not attend the training participated actively in project activities in their countries, and one of them was able to later participate in person in the Year 1 review workshop.

Assumption 3: FLR leaders and managers are supportive of project activities to improve restoration success, including collaborating with forest-dependent communities

Comments: Related activities will start in Year 2 and detailed information is not yet available.

Comments: Assumption has held and consulted stakeholders have expressed interest and support for the project activities in all four countries. While the signing of contracts has been delayed in three countries, this is due to administrative aspects only and no questions have been raised about the project objectives or activities in negotiations.

Assumption 4: Suitable pilot sites exist in target landscapes where viable populations of target species exist and are accessible to community members, there is social capital and trust between key stakeholders (community members across social groups, forestry authorities), and shared interest to integrate conservation and livelihood objectives

Comments: Related activities will start in Year 2 and detailed information is not yet available.

3.5 Achievement of positive impact on biodiversity and poverty reduction

The identified short-term targets are:

- 12 national experts (at least 30% women) have gained skills in seed supply design and data analysis. Women and early- to mid-career staff will be prioritised in the selection of training participants.
Progress to date: 13 national experts (46% women) were trained on analysing gaps in seed supply, and post-training assessment showed significant gains in skills ([Annex 4.1 on post-training survey results](#))
- Forestry and FLR authorities in 4 countries have increased data and improved data management on native tree seed sources relevant to FLR
Progress to date: Seed zone maps were prepared, validated and made publicly available. A new online database of seed sources was developed in Indonesia with the National Research and Innovation Agency, and presented to the Directorate of Forest Tree Seed ([Annex 4.3: Report of visit to Directorate of Forest Tree Seed, Indonesia that resulted in strong support for the project](#))

There were no notable achievements in Year 1 for the other short-term goals as the activities focused on methods and capacity development to analyse gaps in seed source availability and prioritise landscapes for intervention:

- 40 local forestry department staff and other FLR implementers (at least 30% women, except Bangladesh) have gained skills in evaluating and sourcing quality, genetically diverse seed, documenting seed origin, collaborating with local communities in seed supply and incentivising sustainable management of seed sources.
- At least 12 potential new seed sources, of which at least 8 in community forests, other communal lands or smallholders' lands, have been identified to fill in gaps in the supply of quality seed of known origin for native species. Process for registering seed sources has been initiated but may extend beyond project duration.
- At least 40 rural men and women (at least 30% women) have gained information about income opportunities and skills related to seed production, developed working relationships with forestry authorities, established connection with FLR implementers and potential seed buyers in their area, and had access to seed funding to support local seed enterprises.

In Year 2 the activities will focus on connecting local seed suppliers in target communities to FLR projects that are interested to purchase adapted, quality seed, through trainings and seed funding to initiate collaborations.

Expected long-term changes, and project contributions in Year 1 where relevant:

- 400 rural men and women within and beyond the project's target districts gain jobs and income from tree seed collection and production
- 400 rural men and women within and beyond the project's target districts develop mutual trust through engaging in collaboration around sustainable forest management
- Forestry departments and other FLR implementers in four countries improve their access to quality seed of native tree species, which improves the resilience, productivity and conservation value of restored forests

Contribution to date: The new digital directory of tree seed sources in Indonesia allows monitoring of the availability of sources by species, identification of gaps, as well as easier access to information by seed users which is expected to promote the use of adapted quality seed and motivate conservation of seed sources

- Genetic resources of 100 native, threatened species are safeguarded through properly integrating them in FLR and through providing incentives to conserve remaining natural seed sources

Contribution to date: Gaps in the availability of seed sources as genetic reserves for 7 threatened (including 2 CITES-listed) species were identified and communicated to forestry departments across four countries. Gaps in the availability of information for conservation planning for another 4 threatened (including 2 CITES-listed) species were identified and communicated. Trained in-country experts from 4 countries successfully applied the analysis methods to in total 21 native species, setting foundation for expanding the analyses to additional countries.

- Enhanced regional collaboration and exchange of information and experiences between 100 FLR experts from 4 countries, and extended to additional South and Southeast Asian countries through the Asia Pacific Forest Genetic Resources Programme through which the project was conceived.

Contribution to date: Useful policy and legal frameworks for seed source management of native tree species were identified as learning opportunities, and incorporated in the draft regional strategy of the Asia Pacific Forest Genetic Resources Programme of 15 countries. A webinar on [Organising tree seed supply for national forest and landscape restoration targets](#) was organized on 15 March 2023 and advertised among others by FAO, attracting the interest of almost 200 registered participants. One additional expert from Lao PDR was trained as part of the training workshop to conduct gap analysis on seed source availability (with co-funding from the OneCGIAR Initiative on Mixed Farming Systems)

4. Project support to the Conventions, Treaties or Agreements

Project countries have extensive FLR targets, totaling over 49 Mha by 2030. The project supports the achievement of these targets by improving the availability of adapted, quality seed of native tree species, which has been identified as a key constrain for effective restoration in several recent studies ([Jalonen et al. 2018](#), [Bosshard et al. 2021](#), [FAO 2021](#)). Species targeted for improved quality seed supply include *Aquilaria* and *Dalbergia* spp. species listed in CITES Appendix II. The project's relevance to the Convention of Biological Diversity was further highlighted during Year 1, as the CBD Conference of Parties approved the new Global Biodiversity Framework. The Framework includes targets for having at least 30% of degraded ecosystems under effective restoration to enhance biodiversity and ecosystem functions (Target 2), and, for the first time, for maintaining and restoring the genetic diversity of native wild species to maintain their adaptive potential, including through in situ and ex situ conservation and sustainable management practices (Target 4). Indicators under Target 4 make specific reference to halting the extinction of CITES-listed species.

In the Bangladesh Forestry Master Plan 2017-2036, nearly 300,000 hectares of degraded lands are identified as requiring urgent restoration. Restoration of forest ecosystems and tree resources are emphasised in the updated NDC (2021). Bangladesh implements several REDD+ initiatives which emphasise forest conservation and expanding trees outside forests for local livelihoods.

India is among the first Asian countries to commit to the Bonn Challenge with a 26 million hectare restoration pledge. India has established national forest-related targets including National Biodiversity Targets and included forest-related goals and FLR targets in its NDC (2016). India's National Biodiversity Action Plan (Addendum, 2014) calls for immediate attention to conserve and multiply rare, endangered and endemic tree species.

Indonesia's emission reduction targets in the updated NDC in forestry sector include rehabilitating 12 million ha of degraded lands and restoring 2 million ha of peatlands by 2030

(Updated NDC, 2021). In addition, the Presidential regulation No. 120 (2020), accelerated rehabilitation of 500,000 hectares of mangroves.

The Philippines requires adequate supply of quality seeds of native tree species to pursue its Enhanced National Greening Program (ENGP) that targets planting 8.6 million hectares by 2028. The Expanded National Integrated Protected Areas System (ENIPAS) will benefit from the increased protection of important seed sources that the project will identify. These two major programs are core components of the country’s NDC (2021) for climate change adaptation in terms of ecological and environmental stability.

5. Gender equality and social inclusion

Gender equity and social inclusion are relevant in three aspects: availability of seed for species prioritised by marginalized groups for FLR, opportunities for women to participate in seed production, and access to trainings and other forms of support from the project.

Species selection in FLR projects is often based on what is available rather than what the FLR objectives and land users’ needs are (Jalonen et al. 2018; Elias et al. 2021). We considered the relevance of the target species for women and marginalized groups as a criterion during species selection, and selected species include those for fruits, resin and edible seeds in the processing and consumption of which women have an important role.

Species selection also influences women’s opportunities to participate in seed collection. Collection of some species such as *Eucalyptus deglupta*, *Terminalia* spp. and *Xylia xylocarpa* requires climbing the trees while others such as *Pterocarpus* spp. and *Dalbergia latifolia* can be collected from the ground after seed dispersal which is easier for women. Field visits in Indonesia showed that women are involved in seed and seedling production process, and women can form over 50% of the workforce in both local farmer groups’ nurseries and large, modern government nurseries. Providing seed collection equipment and establishing nurseries and seed production areas close to homesteads support women’s participation in seed value chains. Seed extraction and processing also offer income opportunities for women. Such factors will be considered when planning the use of the seed funding in Year 2.

We strive for equal opportunities for female professionals and rural women and other marginalised groups (e.g., by ethnicity and social class) in project trainings and activities. Participation and decision-making in community institutions is often dominated by powerful social groups (Elias et al. 2020). Yet, the most forest-dependent groups stand to benefit the most from seed collection in communal lands and typically have the most detailed ecological knowledge. Such income opportunities also provide them incentives for sustainable forest management which benefits the community at large. These issues will be discussed during trainings in Year 2 to garner wider support among local stakeholders for the role of marginalised groups.

Please quantify the proportion of women on the Project Board ¹ .	50%
Please quantify the proportion of project partners that are led by women, or which have a senior leadership team consisting of at least 50% women ² .	50%

¹ A Project Board has overall authority for the project, is accountable for its success or failure, and supports the senior project manager to successfully deliver the project.

² Partners that have formal governance role in the project, and a formal relationship with the project that may involve staff costs and/or budget management responsibilities.

6. Monitoring and evaluation

The project has the following expected Outcome: *FLR implementers in 4 countries use information on native tree seed demand and supply to improve seed availability and pilot opportunities to involve forest-dependent men and women in seed supply*, and the following outcome indicators:

- National or sub-national maps and databases on the availability of seed sources for native species (target: 4)
- Number of FLR implementers with improved seed sourcing strategies (target: 40)
- Number of new seed sources identified by species, seed zone and land tenure (target: 12)
- Number of forest-dependent men and women identified as potential seed suppliers and receiving seed funding and skills training (target: 40, >30% women)

To demonstrate that project activities and outputs contribute to the outcome, we are documenting the following considerations through bimonthly project meetings:

- Identified data gaps
- Ability to attract trainees with capability to train others and influence decision-making at their organisations
- Pre- and post-training evaluations of knowledge, skills and attitudes; responsiveness of post-training mentoring to trainee needs and demands; and evidence of trainees' progress in applying the new skills and knowledge
- Gender-responsiveness and social equity in the design of community-level activities and decision-making on and allocation of seed funding
- Number and type of connections formed between FLR implementers, seed collectors and small-scale seed enterprises (by gender and social class)

There were no changes to the M&E plan in Year 1.

Biodiversity International as the lead organisation is responsible to ensure M&E across all project activities and operations, and appointed a M&E specialist to guide the process. The planned Advisory Group on M&E between senior representatives of partner institutions could not be initiated in Year 1, given the delays in signing the formal contracts with partners.

7. Lessons learnt

What worked well was regular project meetings and three workshops (of which 2 face-to-face) to review and plan progress and share and reflect on experiences from implementation.

The main challenge was the delay in signing sub-contracts with 3 of 4 partner institutions which were government organisations (see Section 2 on Partnerships). Although delays were anticipated, they were longer than expected. We learned that depending on country, Memoranda of Understanding can be important as a framework for contracts with government institutions and should be initiated even before project approvals to save time. We also learned that signing contracts with universities was much easier than with government institutions, yet would still strive to include government institutions as formal partners also in future, because of the better opportunities for concrete outcomes and impacts.

The selection of target species took longer than expected and some initially selected species had to be replaced due to lack of data on their distributions. These challenges proved again the lack of even basic information on many native threatened tree species for designing effective conservation and restoration strategies. We recommend that where feasible, forest and landscape restoration projects explicitly include at least some native threatened species and pay attention to sourcing genetically diverse seed for these, so that restored populations contribute to genetic conservation of the species. If we did the project again, the training on gap analysis could be organised earlier (by Q2), as the hands-on practice made data needs clear to country partners and helped finalise species lists based on data adequacy. Training was now held in Q3 of Y1 to avoid disruption from Covid-19 regulations.

8. Actions taken in response to previous reviews (if applicable)

Not applicable as this is the first Annual report.

9. Risk Management

Risks in Year 1 were associated with delays in signing sub-contracts with 3 of 4 project partners. These are discussed in sections 2 (Project stakeholders and partners) and 8 (Lessons learnt). Risks did not affect project design, only implementation schedules.

10. Other comments on progress not covered elsewhere

None.

11. Sustainability and legacy

Evidence for increasing interest and capacity resulting from the project in project countries:

- Bangladesh: Collaboration established with several units of the Forest Department. Memorandum of Understanding being developed with the Ministry of Environment, Forest and Climate Change, to support implementation of the project, adoption of its results and follow-up activities.
- India: Memorandum of Understanding is being developed with the Ministry of Environment, Forest and Climate Change the Indian Council of Forestry Research and Education. Discussions with Forest Departments on the application of tree seed zone maps, seed source maps and suitability maps for seed collection have evidenced interest in adopting this information for their tree seed centres. Similarly, the private collectors have also shown interest towards knowing the sources of seeds and improved methods of handling so that they can ensure quality seedlings from their nurseries.
- Indonesia: Strengthening the seed supply system through developing seed zone maps, creating online databases and capacity building in this project has directly answered the needs of tree seed stakeholders in Indonesia. Improvements to the existing yet not applied seed zone map and the paper-based seed source data are the main needs of tree seed authority holders at the national and regional levels. A coordination meeting was held with the Director of Forest Tree Seed (DFTS) in the Ministry of Environment and Forestry and her staff in Jakarta on 16 February 2023, where the project's work plan, examples of seed zone maps for different regions, and a prototype of the information system were presented. The Director is very supportive of this project and plans to have a long-term collaboration with the BRIN team to adopt the results especially in Java Island and fund implementation from 2024 after the project ends. The online information system on seed sources has the potential to become a flagship program for the Ministry (see travel report in [Annex 4.3](#)). Strong support was also obtained from central and regional seed stakeholders (UPTD) under the governor, seed source managers, and seed suppliers as well as other related parties in West Java during a workshop held on 8-9 March 2023.
- Philippines: The project established collaboration with DENR regional offices for collecting data for species distribution modelling, development of seed zone maps, seed source maps and suitability maps in Mindanao and held a related stakeholder workshop on 28 Feb – 1 March 2023. Workshop discussions showed that the collaboration has sparked much interest in the new knowledge and skills for improving the forest landscape restoration programs in Mindanao.

Two new Memoranda of Understanding, with the Ministry of Environment, Forest and Climate Change of Bangladesh, and the Indian Council of Forestry Research and Education, India, are being signed to support implementation of the project, adoption of its results and follow-up activities.

[Seed zone maps](#) from the project have already been published on the project website and are freely available for download. Species distribution and seed source maps will be included in national or partner institution's databases in Year 2 and made freely available where possible. We have set aside funds for publishing an open-access journal article on the methods developed under the project. Two abstracts related to the project were accepted to be presented at the 10th World Congress of the Society of Ecological Restoration, to be held in Australia in September 2023.

Exit strategy

We have worked closely with key stakeholders in each country from the outset (listed in Section 2), to strengthen ownership and adoption. Results and lessons are integrated in the strategies and processes of lead FLR implementing organisations to support replication and scaling. Key processes and stakeholders for exit strategy include:

- **Bangladesh:** Working with PA Co-Management Committees (CMC) to include in their agendas the identification of seed production opportunities and development of technical and institutional capacities. Forest-dependent people are key beneficiaries of the CMC. The CMC build on multi-stakeholder participation and exist for most PA. Therefore, they offer opportunities both to broadly engage with local institutions and actors in the target landscapes, and to scale out the approaches to other PA. We also work with the Bangladesh Forest Research Institute (BFRI) which is mandated to establish and research seed sources, to foster the adoption and scaling of good seed production practices.
- **India:** Engaging with State Forest Departments in Kerala and Tamil Nadu which work with several local communities on FLR. The project partner under the Indian Council of Forestry Research and Education (ICFRE) is mandated to provide capacity strengthening for the State Forest Departments, which offers an established pathway to adoption and scaling. We will also collaborate with the National Afforestation and Eco-Development Board (NAEB, Ministry of Environment, Forest and Climate Change), the government-mandated focal agency for FLR, which collaborates with the State Forest Departments across the country and helps to extend the projects' findings to them.
- **Indonesia:** Collaborating closely with the Directorate of Forest Tree Seed (DFTS) in the Ministry of Environment and Forestry which is responsible for managing and registering seed sources for many FLR tree species at national level, and at regional level with the Regional Technical Implementation Unit (UPTD) under the Governor in West Java. Collaboration with central and local institutions will provide effective capacity development for the many actors involved in tree seed supply system such as FLR practitioners, seed source managers and seed suppliers. A multi-year collaboration will also be developed to duplicate the results method and follow-up activities. The Directorate of Forest Tree Seed has already expressed interest to continue funding the activities after the project support ends. The online information system on seed sources has the potential to become a flagship program for the Ministry (see travel report in [Annex 4.3](#)).
- **Philippines:** Collaborating with the Department of Environment and Natural Resources (DENR) to identify opportunities to expand the project's approaches to People's Organizations and indigenous peoples in the uplands where potential seed sources are located. We also collaborate with the Ecosystems Research and Development Bureau of the DENR to embed the project's findings and recommendations in exiting information management systems about seed sources and protected areas.

The project is designed to reduce identified barriers to scaling up the restoration and conservation of native tree species, by simultaneously addressing factors that affect the demand and availability of quality seed. The approach is necessarily knowledge-intensive and scaling it up requires increased capacities and resources for data analysis and data

management. To help overcome these constraints, the project has been designed and is implemented collaboratively with public research institutions, and in each country, staff from several units and institutions were trained on the methods to build broader capacity and strengthen networking between institutions as a precondition for effective information management around native seed sources.

Emerging results and recommendations from the project and remaining constraints were shared at a regional workshop of the Asia Pacific Forest Genetic Resources Programme (APFORGEN) of 15 member countries in Kuala Lumpur, Malaysia, in March 2023. Network members agreed to incorporate the recommendations in APFORGEN's new strategy for 2023-2030 which will be published in 2023 and is aimed at supporting member countries in the implementation of the Global Biodiversity Framework's conservation and restoration targets. APFORGEN's previous strategy was endorsed by the Asia Pacific Forestry Commission, and a similar recognition will be sought for the updated strategy in 2023, which will importantly contribute to the project's legacy and scaling of its results widely in the Asia-Pacific region.

12. Darwin Initiative identity

Darwin Initiative and UK government logos were used in all major events related to the project:

- Training workshop in Coimbatore, India (reported in local newspapers of *Mathrubhumi* and *Malayala Manorama* with a combined circulation of over 3 million copies, Figure 5) (distinct identity for Darwin)
- Indonesia: Workshop on strengthening the tree seed system to support forest and land rehabilitation (8-9 March 2023) (distinct identity for Darwin)
- Philippines: workshop on strengthening collaborative tree seed supply systems for restoration in Mindanao, 28 Feb to 1 March 2023) (distinct identity for Darwin)
- The Strategy Workshop of APFORGEN (14-17 March 2023) where project approaches and early results were presented ([blog post](#)) (part of a larger programme)
- The regional [webinar on Organising seed supply for National forest and landscape restoration programmes](#) (15 March 2023) (part of a larger programme)

The project has a [website](#) (microsite) on the portal of APFORGEN. Project activities were promoted on the social media accounts of APFORGEN (@APFORGEN) and the Alliance of Bioversity and CIAT (@BiovIntCIAT_eng). [A video interview](#) about the project with the Indonesian coordinator Dr Vivi Yuskianti was published on the website of the Alliance and in Youtube.

വിത്തുപരിപാലനം: ആപ്പ് വികസിപ്പിച്ചു

കോയമ്പത്തൂർ ഫോറസ്റ്റ് ജനറ്റിക്സ് ആൻഡ് ട്രീ ബ്രീഡിങ്ങിലെ (ഐഎഫ്ജിടിബി)എൻവിസ് കേന്ദ്രം മരങ്ങളുടെ വിത്തു പരിപാലനവുമായി ബന്ധപ്പെട്ട ആൻഡ്രോയ്ഡ് മൊബൈൽ ആപ്പ് വികസിപ്പിച്ചു. ബയോവേഴ്സിറ്റി ഇന്റർനാഷണലും ഐഎഫ്ജിടിബിയും ചേർന്ന് വിത്തു സംരക്ഷണവുമായി ബന്ധപ്പെട്ട് നടത്തിയ പരിശീലന പരിപാടിയിൽ ഇന്ത്യൻ കൗൺസിൽ ഓഫ് ഫോറസ്റ്റ് റിസർച്ച് ആൻഡ് എജ്യൂക്കേഷൻ ഡയറക്ടർ അരുൺ സിങ് റാവത്ത് ആപ്പ് പുറ



കോയമ്പത്തൂർ ഫോറസ്റ്റ് ജനറ്റിക്സ് ആൻഡ് ട്രീ ബ്രീഡിങ്ങിൽ മരങ്ങളുടെ വിത്തു പരിപാലനവുമായി ബന്ധപ്പെട്ട മൊബൈൽ ആപ്പ് പുറത്തിറക്കിയപ്പോൾ.

ത്തിറക്കി. ഐഎഫ്ജിടിബി ഡയറക്ടർ ഡോ.സി.കുഞ്ഞിക്കണ്ണൻ, റിസർച്ച് കോ ഓർഡിനേറ്റർ ഡോ.ആർ.യശോദ, ബയോവേഴ്സിറ്റി ഇന്റർനാഷണൽ മേധാവി ഡോ.

റീന യാലോവാൻ, ഡോ.രേഖ ആർ.വാര്യർ എന്നിവർ പ്രസംഗിച്ചു. എൻവിസ് കോ ഓർഡിനേറ്റർ ഡോ.കണ്ണൻവാര്യർ ആപ്പിനെ കുറിച്ച് വിശദീകരിച്ചു.

Figure 5. The project's training workshop was reported in widely circulated local dailies in India.

13. Safeguarding

Has your Safeguarding Policy been updated in the past 12 months?	No
Have any concerns been investigated in the past 12 months	No
Does your project have a Safeguarding focal point?	Yes (Ronaldo Estera, [REDACTED])
Has the focal point attended any formal training in the last 12 months?	Yes: Safeguarding Code of Conduct, Organisation's Fraud Prevention Policy, and training on CEO Fraud.
What proportion (and number) of project staff have received formal training on Safeguarding?	Past: 14% (1 of 7 staff) Planned: 14%
Has there been any lessons learnt or challenges on Safeguarding in the past 12 months? Please ensure no sensitive data is included within responses.	
There are no safeguarding lessons or issues to report in Year 1. The project did not work directly with local communities in Year 1.	
Does the project have any developments or activities planned around Safeguarding in the coming 12 months? If so please specify.	
Yes, organise trainings for local FLR stakeholders (Activity 3.3), develop collaborative workplans for seed and seedling production with FLR implementers and community members (Activity 4.1), and identify and address needs for seed funding to support seed sourcing (Activity 4.2). Safeguarding approaches for these activities were jointly identified in the project proposal by team members, and will be revisited in the bimonthly team meetings when activities are planned in detail.	

14. Project expenditure

Table 1: Project expenditure during the reporting period (1 April 2022 – 31 March 2023)

Please note that values are **indicative** and will be confirmed during financial reporting. Total costs are based on projected values in a Change request which was submitted in December 2022 and approved. Changes were necessary due to delays in signing formal agreements with implementing partners in 3 countries (Bangladesh, India and Indonesia, see section 2 for details). Without signed agreements, operational funds could not be transferred to these partners. In Indonesia, the issue was resolved by having the lead partner directly pay operational costs in Year 1. The arrangement was not possible in the other 2 countries, and their Year 1 operational costs were rebudgeted to Year 2, while staff costs of the lead organisation from Year 2 were rebudgeted to Year 1 to reduce total rebudgeting needs. All changes were included in the approved Change request.

Project spend (indicative) since last Annual Report	2022/23 Grant (£)	2022/23 Total Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)				
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items (see below)				
Monitoring & Evaluation (M&E)				
Others (see below)				
TOTAL	100,614	96,521	-4	Difference was rebudgeted to Year 2 as per approved change request

Table 2: Project mobilising of matched funding during the reporting period (1 April 2022 – 31 March 2023)

	Matched funding secured to date	Total matched funding expected by end of project
Matched funding leveraged by the partners to deliver the project.		
Total additional finance mobilised by new activities		

building on evidence, best practices and project (£)		
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15. OPTIONAL: Outstanding achievements or progress of your project so far (300-400 words maximum). This section may be used for publicity purposes

I agree for the Biodiversity Challenge Funds Secretariat to publish the content of this section (please leave this line in to indicate your agreement to use any material you provide here).

None to report in Year 1.

File Type (Image / Video / Graphic)	File Name or File Location	Caption, country and credit	Online accounts to be tagged (leave blank if none)	Consent of subjects received (delete as necessary)
				Yes / No
				Yes / No
				Yes / No
				Yes / No
				Yes / No

Annex 1: Report of progress and achievements against Logical Framework for Financial Year 2022-2023

Project summary	SMART Indicators	Progress and Achievements April 2022 - March 2023	Actions required/planned for next period
Outcome FLR implementers in 4 countries use information on native tree seed demand and supply to improve seed availability and pilot opportunities to involve forest-dependent men and women in seed supply	<ol style="list-style-type: none"> 1. National or sub-national maps and databases on the availability of seed sources for native species (target: 4) 2. Number of FLR implementers with improved seed sourcing strategies (target: 40) 3. Number of new seed sources identified by species, seed zone and land tenure (target: 12) 4. Number of forest-dependent men and women identified as potential seed suppliers and receiving seed funding and skills training (target: 40, >30% women) 	<ol style="list-style-type: none"> 1. National or subnational seed zone maps available in four countries; maps on seed sources by seed zone available for in total 21 species in 4 countries. (Annex 4.2) 2. Scheduled for Year 2 3. Scheduled for Year 2 4. Scheduled for Year 2 	<ol style="list-style-type: none"> 2. Organise at least 1 training per country for FLR implementers and seed supply chain actors 3. Identify at least 3 new seed sources per country to fill identified gaps 4. Identify 10 current or potential small seed suppliers per country and provide training and seed funding to link them to seed markets with FLR projects
Output 1. Identified gaps in seed source availability for native species in four countries	<ol style="list-style-type: none"> 1.1 Availability of gap analysis methodology 1.2 Number of experts trained and skilled in gap analysis methods, by country and gender (target: 12, >30% women) 1.3 Availability of species distribution, seed zone and seed source maps (target: 20 native species) 	<ol style="list-style-type: none"> 1.1 Achieved, reported in inception workshop report, p.6. 1.2 Achieved, 13 experts trained (46% women), reported in workshop report and Annex 1 1.3 Achieved for 21 species, seed zone maps are published at www.apforigen.org/initiatives/strengthening-seed-supply/ and seed source are maps reported in Annex 2 	
Activity 1.1 Develop methodology for gap analysis on tree seed sources		Completed, see section 3.1	N/A
Activity 1.2 Develop seed zone maps for current and future climates in target countries and validate them with experts		Completed, see section 3.1	N/A
Activity 1.3 Identify data sources and access options on species distributions, seed sources and land uses		Completed, see section 3.1	N/A
Activity 1.4 Train and mentor 3 experts per country to implement gap analysis (Spatial analysis, R statistics, data on forest cover and land tenure) (1 regional workshop, 15 participants)		Completed, see section 3.1	N/A
Output 2. Improved access to information about seed sources and seed origins by forestry authorities and FLR implementers	<ol style="list-style-type: none"> 2.1 Validated priority maps and data-bases on the availability of seed sources 2.2 Number and type of recommend- 	2.1 Partially achieved (1 of 4 countries; delays due to delays in formalising project agreements with partners in 3 countries)	

	ations made and implemented for improving data management on seed sources and seed origins 2.3 Manual on gap analysis methodology and online catalogues on seed sources	2.2 Partially achieved (planned for completion in Year 2): national databases and improvement needs identified in all countries, and digital seed source database developed in Indonesia 2.3. Planned for Year 2	
Activity 2.1. Validate results of the gap analysis with forestry authorities and other stakeholders		Partially completed (1 of 4 countries). Formal validation meetings with authorities could not be organised in other countries due to delays in formalisation of project agreements.	Validation meetings organised in Bangladesh, India and Indonesia
Activity 2.2. Evaluate and improve existing databases on seed sources in collaboration with stakeholders		Partially completed (Year 1 task on evaluating existing databases in all countries, as well as Year 2 task on database improvements in Indonesia)	Improve existing databases in Bangladesh, India and Philippines
Activity 2.3 Make analysis methods and results publicly and freely available		N/A (Year 2)	Develop manual on gap analysis methodology and online catalogues on seed sources
Output 3. Improved understanding of seed quality considerations and community roles in sourcing native tree seed among 40 FLR implementers in 4 countries	3.1 Capacity needs assessment for improving the supply of and demand for quality seed among FLR implementers, forest-dependent communities and other stakeholders (target: 120 stakeholders) 3.2 Number of FLR implementers trained, by country and gender (target: 40, >30% women)	3.1 Partially achieved: data collection completed in 1 country and initiated in 2 other countries, see section 3.2 3.2 Ahead of schedule: Planned for Year 2 but one training already organised in Indonesia with 30 participants, see section 3.2	
Activity 3.1 Identify target districts / regions and training participants based on the gap analysis		Completed, see section 3.1	N/A
Activity 3.2 Assess current capacities and constraints of FLR implementers in sourcing quality native tree seed from local communities and smallholders		Partially completed (surveys and interviews completed in 1 country, initiated in 2 countries and pending formal agreement in 1 country. Data analysis in progress in 2 countries)	Complete data collection and analysis in Bangladesh, India and Indonesia (at least 30 respondents per country), and data analysis in the Philippines
Activity 3.3 Organise one training in each target district / region on sourcing quality seed from communities and seed source conservation, based on the capacity needs assessment		Ahead of schedule – Year 2 activity but 1 training already held in Indonesia in Year 1	Organise at least one training for seed supply chain actors in all countries

<p>Output 4 Identified and tested approaches for connecting FLR implementers and local seed producers</p>	<p>4.1 Number of new seed sources identified by species, seed zone and land tenure (target: 12 of which at least 8 on communal or smallholder lands) 4.2 Number and type of activities carried out to link forest-dependent seed suppliers with FLR projects (by country and gender of participants; use of participatory approaches and gender equity and social inclusion in activity design and funding allocation) 4.3 Recommendations for improving community-based seed supply for FLR</p>	<p>Not initiated – planned for Year 2</p>	
<p>Activity 4.1 Guide FLR implementers (training participants) in developing collaborative work plans for seed collection and production with male and female community members</p>	<p>N/A (Year 2)</p>	<p>Guide FLR implementers (training participants) in developing collaborative work plans for seed collection and production with male and female community members (at least 1 site per country)</p>	
<p>Activity 4.2 Identify and address priority needs for seed funding, using participatory and gender-responsive approaches</p>	<p>N/A (Year 2)</p>	<p>Identify and address priority needs for seed funding, using participatory and gender-responsive approaches (e.g. seed collection or nursery equipment, exchange visits, seed marketing costs)</p>	
<p>Activity 4.3 Document and share lessons learned</p>	<p>N/A (Year 2)</p>	<p>Document and share lessons learned (e.g. site visits, interviews, blog posts or videos)</p>	

Annex 2: Project’s full current Indicators of Success as presented in the application form (unless changes have been agreed)

Project summary	SMART Indicators	Means of verification	Important Assumptions
Impact: <i>The project is a Capacity and Capability project and an explicit impact statement was not required in the project proposal. See section 3.5 on Impact where ‘Change expected’ is used as proxy</i>			
Outcome FLR implementers in 4 countries use information on native tree seed demand and supply to improve seed availability and pilot opportunities to involve forest-dependent men and women in seed supply	1. National or sub-national maps and databases on the availability of seed sources for native species (target: 4) 2. Number of FLR implementers with improved seed sourcing strategies (target: 40) 3. Number of new seed sources identified by species, seed zone and land tenure (target: 12) 4. Number of forest-dependent men and women identified as potential seed suppliers and receiving seed funding and skills training (target: 40, >30% women)	1.1 Data repositories and evidence of use 1.2 Pre-and post-training reports, FLR project workplans on seed sourcing 1.3 Field activity reports, participant interviews, financial records	
Output 1. Identified gaps in seed source availability for native species in four countries	1.1 Availability of gap analysis methodology 1.2 Number of experts trained and skilled in gap analysis methods, by country and gender (target: 12, >30% women) 1.3 Availability of species distribution, seed zone and seed source maps (target: 20 native species)	1.1 Report on methodology 1.2 Pre-and post-training assessments, number of species analysed by experts 1.3 Data repositories	Project partners obtain access to data on species distributions, seed sources and FLR projects in target landscapes Staff with adequate background in data analysis are available for training and mentoring
Output 2. Improved access to information about seed sources and seed origins by forestry authorities and FLR implementers	2.1 Validated priority maps and databases on the availability of seed sources 2.2 Number and type of recommendations made and implemented for improving data management on seed sources and seed origins	2.1 Data and publication repositories 2.2 Records of stakeholder consultations and feedback 2.3 Database structures and content before and after interventions 2.4 Financial records on the uses of seed funding	FLR leaders and managers are supportive of project activities to improve restoration success, including collaborating with forest-dependent communities

	2.3 Manual on gap analysis methodology and online catalogues on seed sources		
Output 3. Improved understanding of seed quality considerations and community roles in sourcing native tree seed among 40 FLR implementers in 4 countries	3.1 Capacity needs assessment for improving the supply of and demand for quality seed among FLR implementers, forest-dependent communities and other stakeholders (target: 120 stakeholders) 3.2 Number of FLR implementers trained, by country and gender (target: 40, >30% women)	3.1 Reports and records of capacity assessment 3.2 Pre- and post-training assessments of knowledge, skills and attitudes	FLR leaders and managers are supportive of project activities to improve restoration success, including collaborating with forest-dependent communities Suitable pilot sites exist in target landscapes where viable populations of target species exist and are accessible to community members, there is social capital and trust between key stakeholders (community members across social groups, forestry authorities), and shared interest to integrate conservation and livelihood objectives
Output 4. Identified and tested approaches for connecting FLR implementers and local seed producers	4.1 Number of new seed sources identified by species, seed zone and land tenure (target: 12 of which at least 8 on communal or smallholder lands) 4.2 Number and type of activities carried out to link forest-dependent seed suppliers with FLR projects (by country and gender of participants; use of participatory approaches and gender equity and social inclusion in activity design and funding allocation) 4.3 Recommendations for improving community-based seed supply for FLR	4.1 Records and maps of seed sources, inclusion in databases 4.2 Field activity reports, participant interviews 4.3 Financial records of the uses of seed funding and related decision-making processes 4.4 Reports of recommendations	As above
Activities			
1.1 Develop methodology for gap analysis on tree seed sources 1.2 Develop seed zone maps for current and future climates in target countries and validate them with experts 1.3 Identify data sources and access options on species distributions, seed sources and land uses 1.4 Train and mentor 3 experts per country to implement gap analysis (Spatial analysis, R statistics, data on forest cover and land tenure) (1 regional workshop, 15 participants) 2.1 Validate results of the gap analysis with forestry authorities and other stakeholders			

2.2 Evaluate and improve existing databases on seed sources in collaboration with stakeholders

2.3 Make analysis methods and results publicly and freely available

3.1 Identify target districts / regions and training participants based on the gap analysis

3.2 Assess current capacities and constraints of FLR implementers in sourcing quality native tree seed from local communities and smallholders

3.3 Organise one training in each target district / region on sourcing quality seed from communities and seed source conservation, based on the capacity needs assessment

4.1 Guide FLR implementers (training participants) in developing collaborative work plans for seed collection and production with male and female community members

4.2 Identify and address priority needs for seed funding, using participatory and gender-responsive approaches

4.3 Document and share lessons learned

Important assumptions

Assumption 1: Project partners obtain access to data on species distributions, seed sources and FLR projects in target landscapes

Assumption 2: Staff with adequate background in data analysis are available for training and mentoring

Assumption 3: FLR leaders and managers are supportive of project activities to improve restoration success, including collaborating with forest-dependent communities

Assumption 4: Suitable pilot sites exist in target landscapes where viable populations of target species exist and are accessible to community members, there is social capital and trust between key stakeholders (community members across social groups, forestry authorities), and shared interest to integrate conservation and livelihood objectives

Annex 3: Standard Indicators

Table 1 Project Standard Indicators

DI Indicator number	Name of indicator using original wording	Name of Indicator after adjusting wording to align with DI Standard Indicators	Units	Disaggregation	Year 1 Total	Year 2 Total	Year 3 Total	Total to date	Total planned during the project
DI-A01	Number of people from key national and local stakeholders completing structured and relevant training	Number of people trained on seed source gap analysis and seed quality Total training weeks: 24	People	35M, 8F	42				92
DI-A03	Number of local/national organisations with improved capability and capacity as a result of project	Number of local/national organisations with improved capability and capacity to source quality native tree seeds from local suppliers	Number of organisations		6				12
DI-A04	Number of people reporting that they are applying new capabilities (skills and knowledge) 6 (or more) months after training.	Number of people reporting that they are applying new capabilities (skills and knowledge) 6 (or more) months after training.	People						52
DI-B01	Number of new/improved habitat management plans available and endorsed	Number of native seed sources identified and designated (or in process to be designated)			-				12
DI-B02	Number of new/improved species management plans available and endorsed	Number of endorsed seed zone maps and databases on seed sources for native species			5				8
DI-B07	Number of people participating in community-based management groups and/or Payment for Ecosystem Service schemes	Number of people participating in native tree seed supply chains	People		-				40

DI Indicator number	Name of indicator using original wording	Name of Indicator after adjusting wording to align with DI Standard Indicators	Units	Disaggregation	Year 1 Total	Year 2 Total	Year 3 Total	Total to date	Total planned during the project
DI-C03	New assessments of habitat conservation action needs published	New methodology and assessment of seed source availability in four countries published			-				1
DI-C13	Number of webinar attendees	Number of webinar attendees	People	Gender disaggregation not available	80				80
DI-C15	Number of Media related activities.	Number of media-related activities (published blogs, newspaper articles)	Number	2 newspaper articles 1 blog	3				5

Table 2 Publications

Title	Type (e.g. journals, manual, CDs)	Detail (authors, year)	Gender of Lead Author	Nationality of Lead Author	Publishers (name, city)	Available from (e.g. weblink or publisher if not available online)
*Strengthening collaborative tree seed supply systems for restoration in Asia: Inception workshop report	Report	Jalonen R, 2022	F	Finland	Alliance of Bioversity and CIAT, Penang, Malaysia	www.apforgen.org/fileadmin/user_upload/Darwin_Inception_workshop_report_2022_FINAL.pdf
*Assessing the availability of tree seed sources for forest and landscape restoration: Training workshop report	Report	Jalonen R, 2022	F	Finland	Alliance of Bioversity and CIAT, Penang, Malaysia	www.apforgen.org/fileadmin/user_upload/Darwin_Training_workshop_report_2022_FINAL.pdf
*Seed zone maps	Map	Fremout T, Nur Siddiqui B, Warriar R, Yuskianti V, Tolentino jr E, T burano jr C, Jalonen R, 2022	M	Belgian	Alliance of Bioversity and CIAT, Penang, Malaysia	www.apforgen.org/initiatives/strengthening-seed-supply/activities

Checklist for submission

	Check
Different reporting templates have different questions, and it is important you use the correct one. Have you checked you have used the correct template (checking fund, type of report (i.e. Annual or Final), and year) and deleted the blue guidance text before submission?	Yes
Is the report less than 10MB? If so, please email to BCF-Reports@niras.com putting the project number in the Subject line.	Yes
Is your report more than 10MB? If so, please discuss with BCF-Reports@niras.com about the best way to deliver the report, putting the project number in the Subject line.	No
Have you included means of verification? You should not submit every project document, but the main outputs and a selection of the others would strengthen the report.	Yes
Do you have hard copies of material you need to submit with the report? If so, please make this clear in the covering email and ensure all material is marked with the project number. However, we would expect that most material will now be electronic.	No
If you are submitting photos for publicity purposes, do these meet the outlined requirements (see section 15)?	N/A
Have you involved your partners in preparation of the report and named the main contributors	Yes
Have you completed the Project Expenditure table fully?	Yes
Do not include claim forms or other communications with this report.	