Darwin Initiative Capability & Capacity: Final Report

To be completed with reference to the "Project Reporting Information Note": (https://www.darwininitiative.org.uk/resources/information-notes/).

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

Submission Deadline: no later than 3 months after agreed end date.

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 Organisation	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 2025 (24 + 12 months; extension granted in October 2023)
Project Leader's 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, Rekha R Warrier, Vivi Yuskianti, Enrique Tolentino jr, Cristino Tiburan jr., Md Zahidur Rahman Miah, Tauhidor Rahaman, Peter Wilkie 30 June 2025

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 worked with forestry authorities, FLR implementers and forest-dependent communities in Bangladesh, India (Andra Pradesh, Karnataka, Kerala, and Tamil Nadu), Indonesia (Java) and the Philippines (Mindanao) 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 Partnerships

Partner involvement in activities

The project proposal, objectives, workplan and budget were developed collaboratively between all partners in 2021, based on a joint background study that demonstrated the need for such a project (Bosshard et al. 2021). The project team held an online inception workshop (2022, Report), half-day annual review meeting after Y1 (2023), a four-day results workshop (2024, Report), and approximately bi-monthly team meetings online, to together review progress, share experiences in implementation, and plan upcoming activities. All project partners contributed to the writing of this final report.

The partners established collaboration with key organisations and units responsible for tree seed production, forest restoration and forest biodiversity conservation in the project countries as follows:

- India: Tamil Nadu and Kerala Forest Departments
- Indonesia: The Directorate of Forest Tree Seed (DFTS) at the Ministry of Environment and Forestry; Regional Technical Implementation Units (UPTD) for Certification and

Forest Tree Seeds of West Java Provincial Forestry Service and Banten Provincial Forestry and Environmental Service

- The Philippines: Mindanao Tree Seed Centre; and Forest and Wetland Research, Development and Extension Center of the Ecosystems Research and Development Bureau, Department of Environment and Natural Resources.
- Bangladesh: Bangladesh Forest Department: Botanical Garden, Resource Information System Unit, Management Plan Unit, and Forest Divisions implementing forest and landscape restoration.

Achievements, lessons, challenges

- **Strong buy-in**: The project saw an exceptional buy-in from government organizations in India and Indonesia, which allowed expanding and scaling activities to new districts. Targets for skills training in seed and seedling production were exceeded manifold. Information systems developed by the project were adopted by government agencies in each country.
- **Contracting issues**: Major delays were experienced in signing collaborative agreements with the government partners in 3 of 4 countries (all except the Philippines), due to local institutional requirements and negotiations on the contract terms. As a result, India and Indonesia were only able to receive the funds and start on-the ground implementation in October 2023 (after 18 months). An extension to a third year of implementation in these two countries was, therefore, sought and approved (approved Change Request CR23-059). The sub-contract with the Bangladesh partner did not progress despite multiple attempts, although a Memorandum of Understanding was signed between the Government of Bangladesh and Bioversity International as the project lead. Hence, country-level targets for Bangladesh were dropped, and the reserved funds were reallocated for organising the results workshop (approved Change Request CR23-059). Nonetheless, Bangladesh Forest Department participated in the training on the project methods and the related regional study on seed availability for restoration (Annex 5.1).
- **Strengthening institutional capacities:** While the contracting delays were unfortunate, the process developed the capacities of the in-country teams to set up international projects and understand contract terms and requirements for receiving international funding. Moreover, it stimulated broader agreements for long-term institutional collaborations; the lead partner was invited to sign a Memorandum of Understanding with government institutions in both India and Bangladesh to further collaboration on forest restoration and conservation. While contracting universities (as in the Philippines) is generally easier than contracting government institutions, 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, as the strong buy-in and scaling in India and Indonesia shows.

All project partners in target countries are members of the Asia Pacific Forest Genetic Resources Programme (APFORGEN, www.apforgen.org), which provides a platform for continued collaboration after the project. Three of the partners, Bioversity International, the National research and Innovation Agency of Indonesia (BRIN), and Royal Botanic Garden Edinburgh are already collaborating on a new forest restoration project in Kalimantan with funding from the UK Global Centre on Biodiversity for Climate (see section 12).

3 Project Achievements

3.1 Outputs

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

- **Availability of gap analysis 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. The methodology is described in detail the research manuscript (Annex 5.1-5.3).

- **Number of experts trained and skilled in gap analysis methods, by country and gender** (target: 12, >30% women)

  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 5.4 on post-training survey results)

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

  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 (Figure 1). The maps will be published part of the scientific article on the project methods and results (Annex 5.1), and are already available on APFORGEN website). 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 were prepared for 21 native pilot species (Annex 5.1, 5.3). Thirty-eight percent of the species are threatened on the IUCN Red List of Threatened Species (see Table 1 for the list of species).

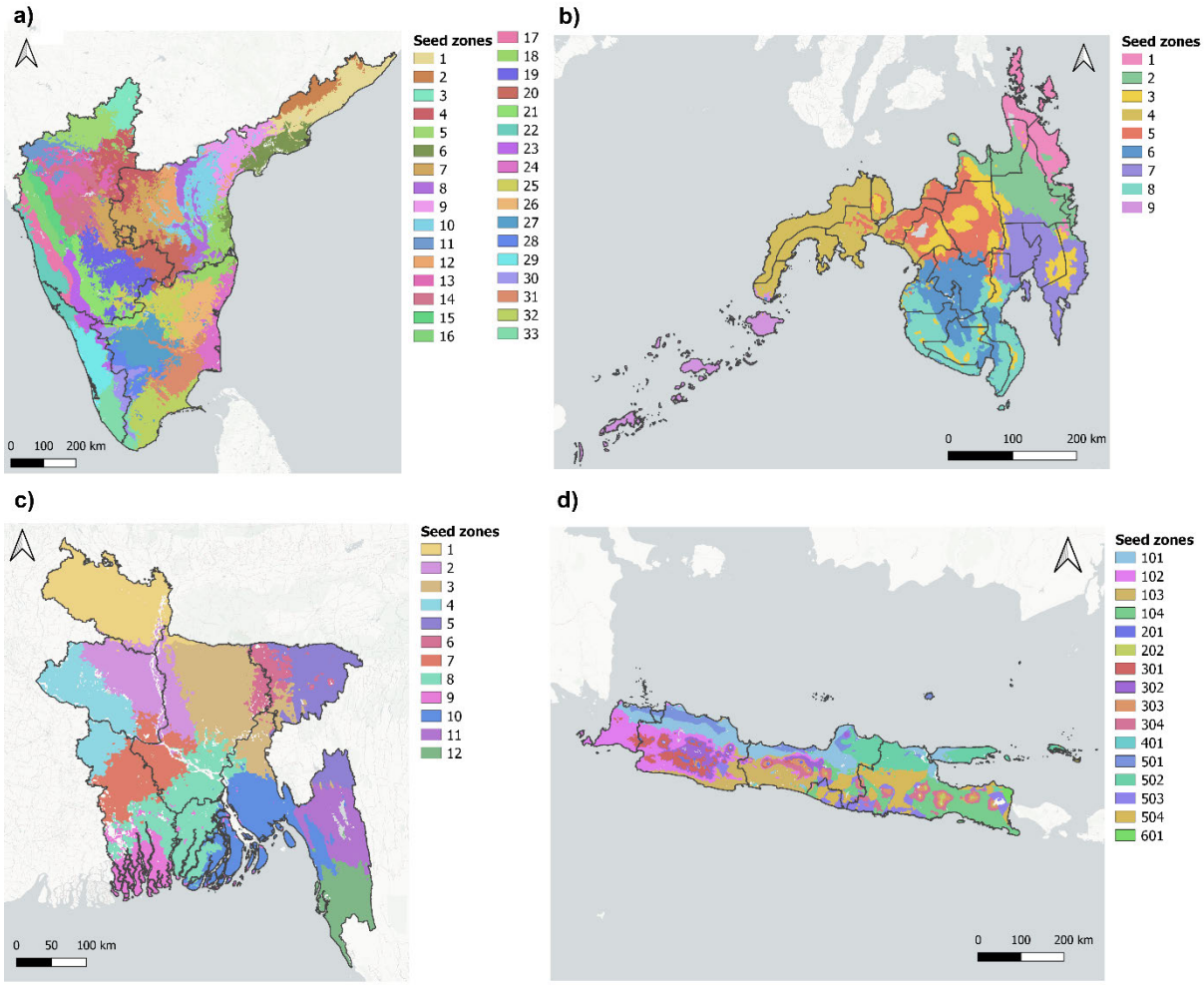

Figure 1. Seed zone maps for (a) Southern India, (b) Mindanao island (Philippines), (c) Bangladesh, and (d) Java island (Indonesia). For methodology, see Annex 1.

Note that only output 1 was implemented in Bangladesh as it focused on desk studies and trainings; the subsequent outputs 2-4 which would have required formal collaboration and field work could not be implemented due to lack of progress in subcontracting the national partner (Change request CR23-059).

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**

  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 four project countries (Table 1, maps for all species available in Annex 5.1 and 5.3). Seed sources were available for only 34% of seed zones, and 24% of the study species had no designated seed sources at all.

Table 1. Availability of known seed sources by seed zone within species' modeled ranges in study countries.

Species	Conservation status[1]	Country	Target area	Total number of seed sources	Seed zones within species distribution	Seed zones with designated seed sources	
						Number	%
Aglaia chittagonga	VU	Bangladesh	Country-wide	36	11	7	64
Aglaia spectabilis	LC			37	12	9	75
Artocarpus chama	NE			34	8	6	75
Schima wallichii	LC			29	10	4	40
Stereospermum colais	LC			37	5	3	60
Aquilaria malaccensis	CR	Indonesia	Java	25	13	1	8
Falcataria falcata	LC			26	18	5	28
Magnolia sumatrana	LC			0	19	0	0
Neolamarckia cadamba	NE			3	22	0	0
Pinus merkusii	VU			24	22	3	14
Agathis dammara	VU	Philippines	Mindanao	6	9	1	11
Cinnamomum mercadoi	LC			0	8	0	0
Eucalyptus deglupta	VU			0	9	0	0
Pterocarpus indicus	EN			0	8	4	50
Pentacme paucinervis	LC			24	9	0	0
Dalbergia latifolia	VU	India	Andhra Pradesh, Kerala, Karnataka, Tamil Nadu	228	28	14	50
Pterocarpus marsupium	NT			49	33	11	33
Tectona grandis	EN			149	33	8	24
Terminalia bellirica	LC			35	33	16	48
Terminalia chebula	LC			55	33	20	61
Xylia xylocarpa	LC			38	33	17	51

[1] Conservation status on the IUCN Red List of Threatened Species: CR=Critically Endangered, EN=Endangered, VU=Vulnerable, NT=Near Threatened, LC=Least Concern, NA=Not Evaluated (2025).

- **Number and type of recommendations made and implemented for improving data management on seed sources and seed origins**

  Baseline: Paper-based information on seed sources existed in Indonesia, maintained by the Directorate of Forest Tree Seed. 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 (MFTSC) maintain some data on seed sources, but it is fragmented and difficult to access. Likewise, the public, particularly the restoration practitioners and tree planters, have no direct access to these information. Databases on seed sources did not exist in India and Bangladesh.

  Change to date and evidence: Three new information systems were established and one existing system updated across India, Indonesia and the Philippines. *In India*, the national partner IFGTB developed and updated two information platforms on tree seed supply for restoration for different users: (1) An open-access web database on tree seed sources, seed suppliers, and the newly created seed zone maps was created on the website on Environment Information, Awareness, Capacity Building and Livelihood Programme (EIACP) of IFGTB (http://ifgtbenvis.in/). The database includes the information on the seed and plant suppliers collected through surveys and interviews during the project — including 35 government nurseries, 60 private sector nurseries, and 30 community nurseries, with their locations, contact details, and procurement procedures. (2) Information on seed zones, seed sources and suppliers by seed zone was also included in an existing mobile app by IFGTB, Forest Seed Science and Technology app, enabling users to identify suitable germplasm sources and address gaps in the availability of well-adapted seed for varying environmental conditions. (Figure 2).

  In Indonesia, a digital Forest Tree Seed Information System was developed and has received an Intellectual Property Right from the Directorate General of Intellectual Property (DJKI) at the Ministry of Law and Human Rights of the Republic of Indonesia (Figure 3). The information system includes data on seed sources owned by community groups (93 sources) and individual landowners (249 landowners).

  In the Philippines, the database of the Mindanao Forest Tree Seed Centre was updated to include the seed zone maps developed through the project, and a website was developed to provide access to information on existing seed sources and suppliers to the public (https://mftsc.online/). As of June 2025, the database includes contact details of 8 community organisations or smallholders supplying native tree seed in Mindanao (Figure 4)

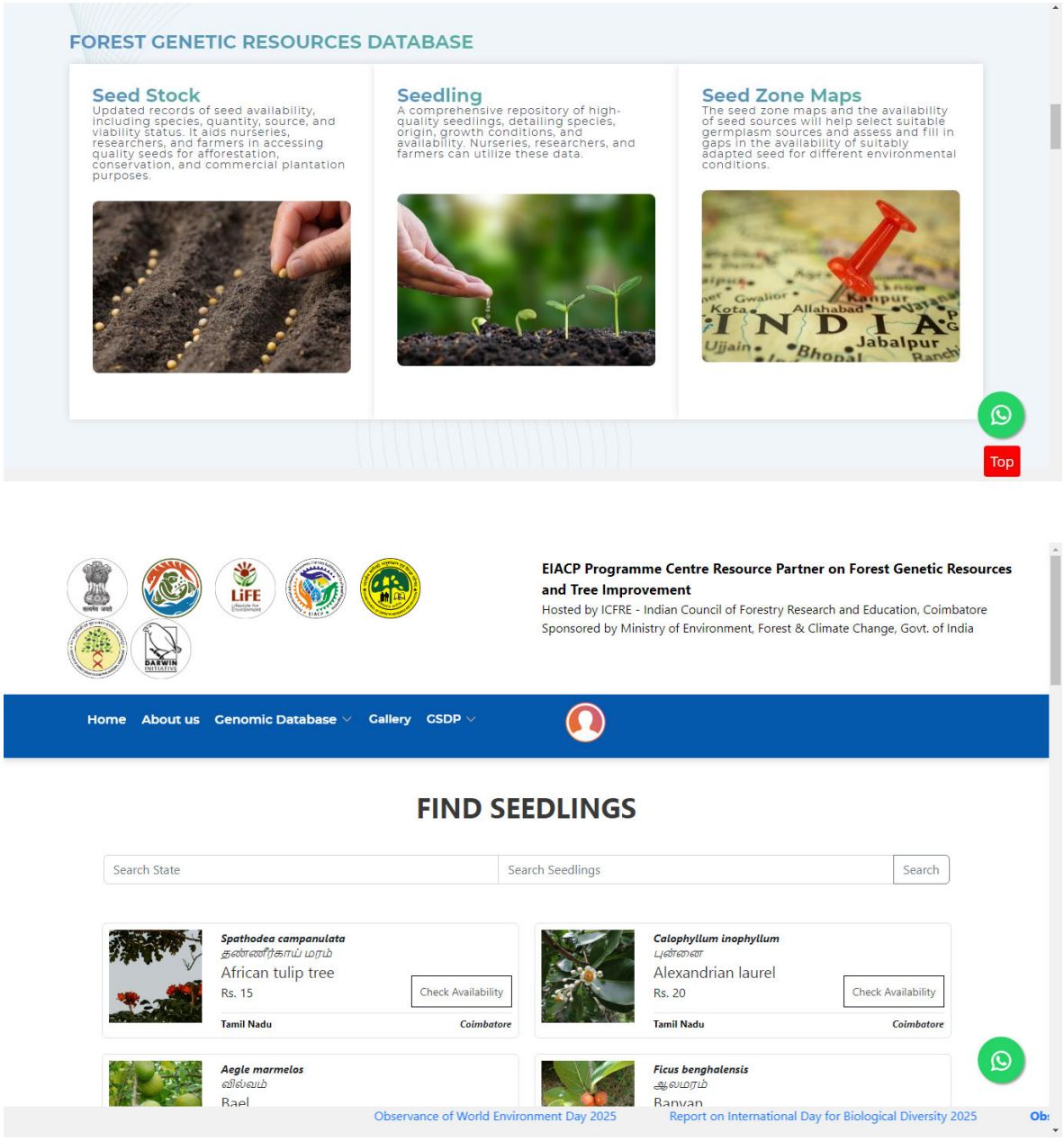

Figure 2. Examples of the contents of the Forest Genetic Resources Database established with the IFGTB: (a) landing page, (b) seedling stock with supplier details.

Figure 3. Examples of the contents of the Tree Seed Information System in Indonesia: (a) landing page / dashboard showing information e.g. on seed sources, seed production, production of certified seed, and seed transactions, (b) registry of seed sources.

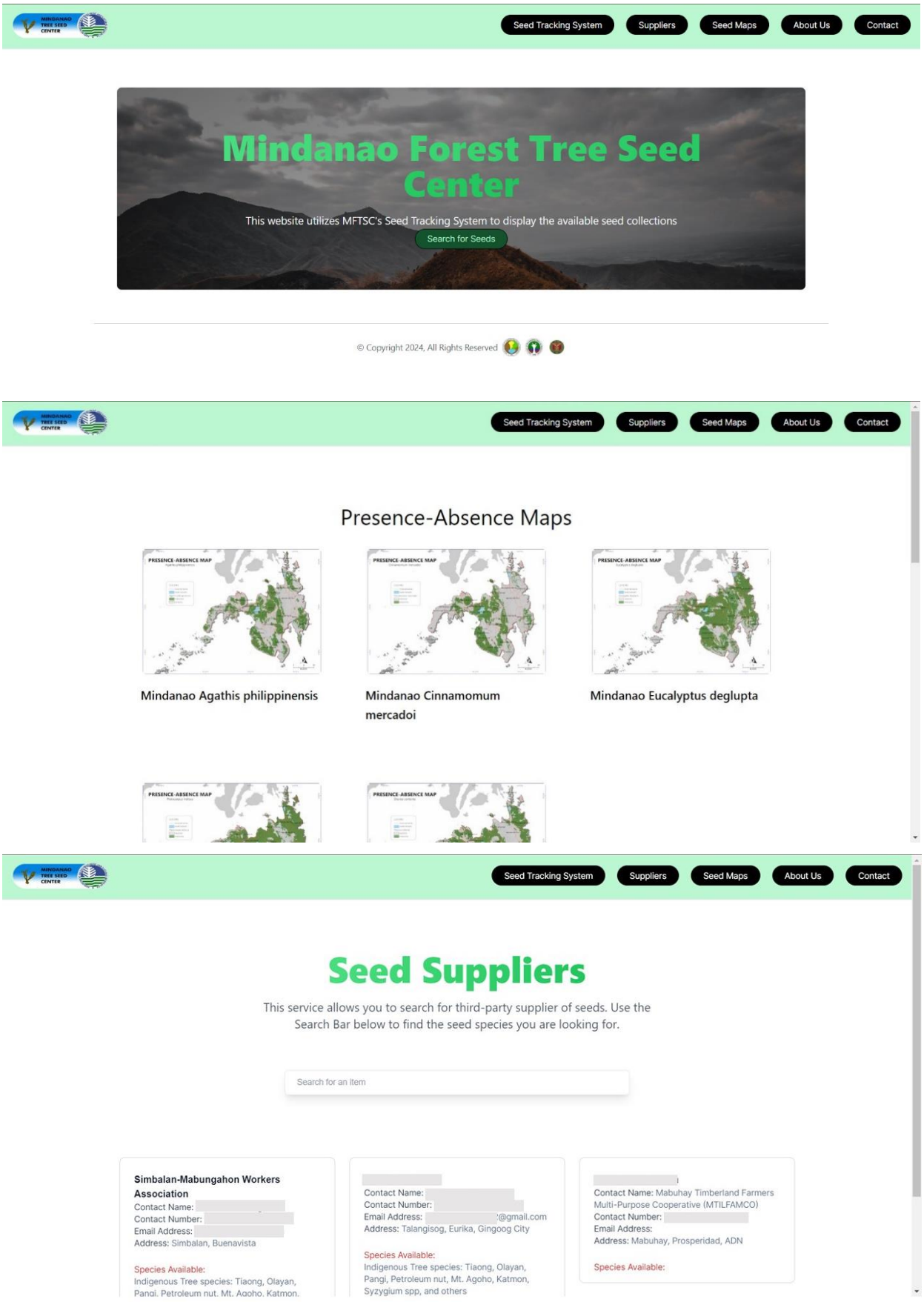

Figure 4. Examples of the contents of the Tree Seed Information System established with the Mindanao Forest Tree Seed Center: (a) landing page, (b) species distribution maps, (c) seed suppliers (contact details of individuals hidden for the purpose of this report). Website: https://mftsc.online/

Output 3 Improved understanding of seed quality considerations and community roles in sourcing native tree seed among 30 FLR implementers in 3 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)

  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: In total 403 stakeholders from government, private sector and community organisations were surveyed during the capacity needs assessments in India, Indonesia and the Philippines (448% of target). Including online surveys and widespread interest from stakeholders enabled exceeding the targets manifold. Results by country are briefly summarised below.

  In Indonesia, the capacity assessment results based on 45 respondents showed generally good awareness of the existing regulations and certification systems on tree seed, but gaps in the use of seed zone maps, knowledge on the impacts of climate change on restoration sites, and propagation techniques (Figure 3). Most commonly cited problems in seed availability were overall lack of seed sources (59% respondents), lack of seed sources of preferred provenances or origin (53%), and degradation or fragmentation of seed sources (50%). Nurseries commonly faced problems with lack of knowledge and pests and diseases attacks. Smallholder nurseries sell seeds or seedlings to private companies, civil society organisations and government agencies, typically to 5-6 customers per year. Interviewed nurseries commonly expressed concerns of low pricing of seeds and seedlings.

  In India, 100 nursery operators, seed suppliers and seedling distributors were interviewed to assess current capacities and capacity development needs. It was observed that the seed production process is well managed by the public extension centres: identified and well-documented seed sources (Seed Stands, Seed Production Areas, Seedling Seed Orchards and Clonal Seed Orchards) are maintained in an organised manner and seed collection and supply happens from the sources. Unfortunately, a huge gap exists between the demand and supply of quality seed of native species. Private family-run and small- to medium-sized nurseries often source and distribute seeds and seedlings between states without attention to suitability, and operations suffer from poor germination rates and propagation success. Significant gaps were identified in understanding the concept of seed transfer zones and the impacts of climate change on restoration sites, and knowledge of advanced propagation techniques. Key challenges in seed availability reported by respondents included an overall lack of seed sources, limited to no availability of seed from preferred provenances or origins, and lack of information on existing seed sources. Hands-on trainings of at least one week were preferred to shorter trainings to effectively build capacities.

  In the Philippines, a total of 258 respondents were surveyed, including 23 seed source managers, 62 seed and seedling suppliers, and 173 end-users who collect, produce or purchase tree seeds or seedlings for their own purposes, mainly from People's or farmers' organizations. Results show that end-users lack access to resources that would support effective planning and implementation of seed sourcing. Only 35% of respondents used

registries of seed sources, 34% used registries of seed suppliers when planning their activities, and the majority of the remaining respondents did not know of the existence of such resources or did not have access to them (Figure 6). When facing a lack of seeds or seedlings of native tree species, 41% of respondents frequently changed to exotic species and 39% resorted to collecting wildlings. Majority of the respondents also lacked information of how to increase the resilience of restored forests against climate change. Most commonly cited skills or knowledge that respondents felt they needed to improve were advanced propagation techniques; seed selection, collection, processing, storage and germination, control & management of diseases, identification or viable and quality seeds, and knowledge on planting other tree species.

Figure 5. Nurseries visited for capacity needs assessment in Tamil Nadu, India. Photo: IFGTB.

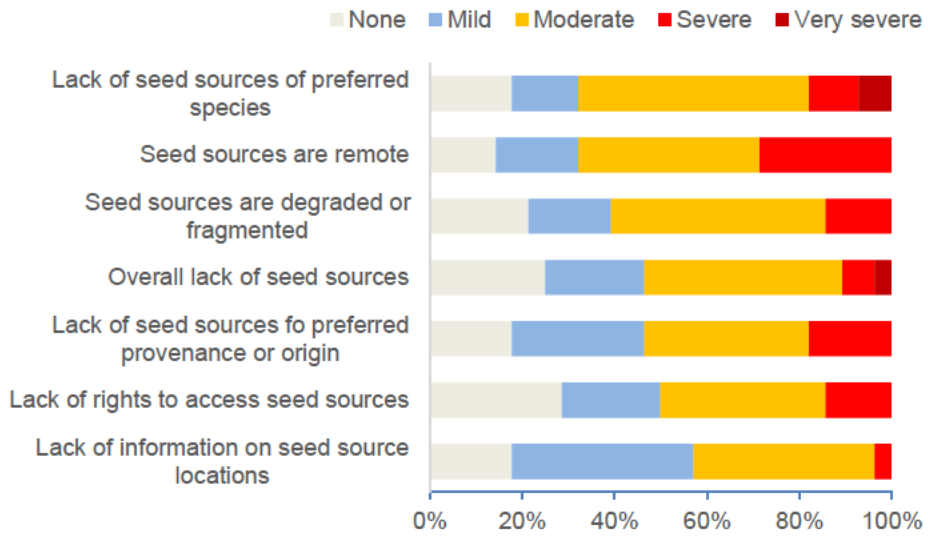

Figure 6. Problems with seed sources among interviewed stakeholders in the Philippines.

- **Number of FLR implementers trained, by country and gender** (target: 30, >30% women)

  Baseline: We are not aware of 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: In total 360 stakeholders were trained (41% women) (1200% of target) (Table 2, Figure 7-9). Strong buy-in and support from governments in Indonesia and India allowed exceeding training targets manifold. One of the trainings in Indonesia was featured in a local newspaper article.

Table 2. List of trainings provided under the project.

Training topic	Country	Venue and dates	Trainees (type)	No. trainees	% Women
Training on Quality Seed and Seedling Production for Native species	India	1) IFGTB, Coimbatore, 01 March 2024 2) Madurai Agricultural extension centre, 25-27 March 2024 3) Madurai Agricultural extension centre, 25-27 March 2024	Forest department staff	90	33
Sourcing high-quality native tree seeds from local communities and smallholders	India	1) Ulundurpet, Viluppuram Circle, 25-27 Sept 2024	FLR implementers	45	27
Training for Forest Tree Seed Quality Examiners	Indonesia	Jatinangor, West Java, 22-30 November 2023	Forest department staff	30	40
Handling Forest Tree Seeds and Seedling for FLR	Indonesia	1) Giri Jaya Forest Farmer group, Bandung, 22 Feb 2024 2) Kausar Forest Farmer Group, Bandung, 27 March 2024 3) Tani Makmur I Farmer Group, Oakemitan Kidul Tasikmalaya, 29 March 2024	Forest Farmer Groups managing community-based nurseries	107	48
improving the quality of seeds and seedlings for Forest and Land Rehabilitation programs (2 training events)	Indonesia	1) Gunungsari, Banten, 13 August, 2024 2) Saruni village, Pandeglan, Banten, January 30, 2025	Forestry extension, Regional Forestry Service, Perhutani, community self-help counselors, forest farmer groups, seed source owners, village officials	70	43
Seed and Seedling Production of Native Trees in Mindanao for Forest and Landscape Restoration in a Changing Environment	Philippines	Bislig City, Mindanao, 21-23 February 2024	Foresters, members of People's Organizations, cooperatives producing nursery-raised native tree species	18	78
Total		10 training events		360	41

In Indonesia, a book on *Technology for Handling Seeds and Seedlings of Potential Species for Forest and Landscape Restoration in Indonesia* was written and published with co-funding from the project (Figure 10). The book incorporates project results such as the seed zone maps and guidance on handling several of the project's target species, and acknowledges funding support of the Darwin Initiative.

Figure 7. Trainings on native seed production and supply for staff of Tamil Nadu Forest Department, India.

Figure 8. Trainings on native seed production and supply for representatives of community organisations and local government, Mindanao, the Philippines.

Figure 9. Training participant enthusiasm during trainings on improving the quality of seeds and seedlings for forest and land rehabilitation programs in Indonesia. *Top:* Serang Regency, Banten, *Middle:* Pandeglang regency, Banten, *Bottom:* Giri Jaya Farmer Group, West Java.

Figure 10. Book "Technology for Handling Seeds and Seedlings of Potential Species for Forest and Landscape Restoration in Indonesia".

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: 9 of which at least 6 on communal or smallholder lands)

  Baseline: Availability of seed sources by seed zone were analysed for pilot species under Output 2. Across the 21 species, only 34% of identified seed zones had identified seed sources, and 24% of species had no sources at all.

  Change to date and evidence: Total 11 new seed sources were identified. Five seed source populations were identified in the Philippines in an area of 3,787 ha belonging to the Higaonon Tribe under the Certificate of Ancestral Domain. The area has seed source populations for all the project's five target species in the Philippines (Table 3), as well as other native species, such as *Shorea negrosensis, S. almon, S. palosapis, Parashorea malaanonan,* and several *Syzygium* spp). The Higaonon Tribe was added to the online database of seed suppliers of MFTSC (see Output 2), invited to the trainings, and provided seed funding for nursery improvement. *In Indonesia,* six new candidate seed sources were identified in three villages in Banten province: four sources for manglid (*Magnolia sumatrana*) in Pulosari District, Pandeglang Regency, one for agarwood (*Aquilaria malaccensis*) in Cigeulis Village, Cigeulis District, Pandeglang Regency, and one source for balsa (*Ochroma pyramidale*) in Katumbiri Village, Cigeulis District, Pandeglang Regency (Figure 11). According to regulations in Indonesia, every potential seed source needs to be certified to ensure the quality of the seeds it produces, and it was already anticipated in the project proposal that this process will likely take longer than the project duration. Nevertheless, the registration of the balsa seed source was already completed and the source was recognized by the Indonesian government as a certified seed source in the Identified Seed Stand category at the end of 2024 (Figure 11d).

Table 3. List of newly identified seed sources.

Country	Location	No. seed sources	Species	Tenure
Philippines	Mindanao	5	*Agathis dammara*, *Cinnamomum mercadoi*, *Eucalyptus deglupta*, *Pterocarpus indicus*, *Shorea contorta*	Certificate of Ancestral Domain
Indonesia	Sukasari Village, Banten province	2	*Magnolia sumatrana*	Smallholder land
Indonesia	Banjarwangi village, Banten province	2	*Magnolia sumatrana*	Smallholder land
Indonesia	Cigeulis village, Banten province	1	*Aquilaria malaccensis*	Smallholder land
Indonesia	Katumbiri village, Banten province	1	*Ochroma pyramidale*	Smallholder land
Total	**5 villages**	**11**	**8 species**	

No new seed sources could be identified in India during the project, due to the lack of a formal mechanism to recognise seed sources outside government land. All seed sources are managed either by the Forest Department or research institutes, and local people who produce seedlings depend on these seed sources. Nevertheless, the project results have

informed a new project by Tamil Nadu Forest Department, called “Establishment of Seed Production Areas for Commercially Important Tree Species in Selected Forestry Extension Centers of Tamil Nadu”, where IFGTB will collaborate. The project seeks to increase the availability and genetic diversity of planting material for key species across five districts, including for teak and *Xylia xylocarpa* which were the pilot species of this project. IFGTB is also exploring additional funding sources to continue the work. A proposal was submitted to the Tamil Nadu State Research wing to evaluate the production capacity of existing seed sources (seed yield, seed quality, and seedling vigour in existing seed orchards, seed production areas and seed stands), and the availability of additional seed sources within the seed zones.

(a)

(b)

(c)

(d)

PEMERINTAH PROVINSI BANTEN
DINAS LINGKUNGAN HIDUP DAN KEHUTANAN
UPTD SERTIFIKASI DAN PERBENIHAN TANAMAN HUTAN
Jl. Raya Serang Cilegon Km 10 Pejaten, Kramatwatu, Kabupaten Serang Banten

SERTIFIKAT
SUMBER BENIH TANAMAN HUTAN
Nomor : 522/ 02 /UPTD SPTH/SSB/XII/2024

Dengan ini menerangkan bahwa sumber benih :

1. Nomor Sumber Benih : 36.02.147
2. Luas Areal : 2.500 M2
3. Nama Species : Balsa (*Ochroma bicolor rowlee*)
4. Asal Benih : Benih Lokal
5. Pemilik/Pengelola : Ade Bahrudin
6. Alamat Pengelola : Desa Katumbiri Kecamatan Cigeulis Kabupaten Pandeglang
7. Nomor Telepon : 083841362004
8. Lokasi Sumber Benih :
   a. Desa/RPH : Katumbiri
   b. Kecamatan/BKPH : Cigeulis
   c. Kabupaten/KPH : Pandeglang
   d. Letak Geografis : 06°38'51.7" S 105°41'11,4" E
   e. Ketinggian Tempat : 267 Mdpl

Telah memenuhi persyaratan sebagai sumber benih dengan klasifikasi :

Tegakan Benih Teridentifikasi (TBT)

Demikian sertifikat ini dibuat dengan sebenarnya untuk dapat dipergunakan sebagaimana mestinya.

Serang, 25 November 2024

Sertifikat ini berlaku s/d

Seumur hidup selama :
1. Tidak ada perubahan fungsi/status
2. Sumber benih tersebut masih produktif.

Kepala UPTD SPTH

H. [illegible], SE., M. Si
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Keterangan: *) Coret yang tidak perlu

Figure 11. Candidate seed sources and balsa seed source certificate, (a) candidate manglid (*Magnolia sumatrana*) seed source in Sukasari Village, (b) candidate agarwood (*Aquilaria malaccensis*) seed source in Cigeulis Village, (c) newly certified balsa (*Ochroma pyramidale*) seed source and (d) its certificate.

- **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)

  Baseline: We are not aware of other projects specifically focused on linking tree seed suppliers to projects.

  Change to date and evidence: In total 32 farmer groups and smallholder nurseries across the three countries were supported to expand their activities through seed funding, based on participatory identification of needs (Table 4). Total amount of seed funding distributed totaled approx. £6,020. In Indonesia, the needs assessment with seed producers showed that they were experiencing relatively good demand for seeds and seedlings, and prioritised investments in production rather than marketing. Seed funding for nursery equipment was provided to three farmer groups who manage community-based nurseries in West Java, and to 11 farmer groups in Banten province (Figure 12). Farmer groups identified the needed materials themselves with support from the Regional Technical Implementation Units for Certification and Forest Tree Seeds (UPTD SPTH). In total IDR 95,710,850 (approx. £4,320) worth of nursery equipment such as water tanks, polybags and fertilisers were distributed to the groups. In the Philippines, 10 People's organizations (community organisations) received a variety of seed and nursery supplies and tools for improved and increased production of native tree seedlings worth approx. £1,400 based on needs identified during the training (Figure 13). In India, small private nurseries in rural areas received support for increasing production of planting material, including fertilisers, growth promoters and nature-based bioformulations worth 35,000 INR (approx. £300). Some nursery operators also requested small equipment, but it could not be provided due to the administrative rules of IFGTB on procuring capital assets.

  Table 4. List of farmer groups and smallholder nurseries receiving seed funding from the project

No.	Recipient	Location
Indonesia		
1	Giri Jaya Forest Farmer Group	Nagrog Village, Bandung, West Java
2	Kausar Forest Farmer Group	Cibodas Village, Bandung, West Java
3	Tani Makmur I Farmer Group	Pakemitan Kidul Tasikmalaya, West Java
4	KTH Panorama Alam	Kadu Agung Village, Gunungsari Disctrict, Serang Regency
5	KTH Panorama Hijau	Curug Sulanjana Village, Gunungsari District, Serang Regency
6	KTH Lestari Alam	Tamiang Village, Gunungsari District, Serang Regency
7	KTH Pelangi	Katumbiri Village, Cigeulis District, Pandeglang Regency
8	KTH Tani Agung	Cigeulis Village, Cigeulis District, Pandeglang Regency
9	KTH Barokah	Sukasari Village, Pulosari District, Pandeglang Regency
10	KTH Geohara Tani Organik	Kp. Pasirpeuteuy, Pasirpeuteuy Village, Cadasari District, Pandeglang Regency
11	KWT Sekartani	Saruni Village, Majasari District, Pandeglang Regency
12	KTH Cipta Sejahtera	Cipadang District, Cileles District, Lebak Regency
13	KTH Mulya Tani	Ciakar Village, Gunungkencana District, Lebak Regency
14	KTH Sukatani	Cipacung Village, Majasari District, Pandeglang Regency
Philippines		
1	Simbalan-Mabungahon Workers Association	Simbalan, Buenavista, Mindanao
2	SONATA, Higaonon Tribe	Talangisok, Eurika, Gingoog City, Mindanao
3	Mabuhay Timberland Farmers Multi-Purpose Cooperative (MTILFAMCO)	Mabuhay, Prosperidad, ADN, Mindanao

No.	Recipient	Location
4	Mindanao Agroforestry Center Incorporated	Malaybalay City, Mindanao
5	Bukidnon Umayamnon Tribe Kapu-unan To Mga Datu (BUKDA)	Cabanglasan, Bukidnon, Mindanao
6	Xynara Therese Nursery	Kalasungay, Malaybalay City, Mindanao
7	USTP- Best Friend Forest Movement	Cagayan de Oro City, Mindanao
8	Casilayan Softwood Development Corporation	Talacogon, Agusan del Sur, Mindanao
9	Malasag Womens Multi-purpose Coorperative	Malasag, Cugman, Cagayan de Oro City, Mindanao
10	Gina Alcisio (Nursery operator)	Bingcongan, Bislig City, Mindanao
India		
1	FTN Nursery Garden	Maraimalainagar, Chennai
2	Green Orchids Nursery	Chettipuniyam, Chengalpattu
3	JP Nursery	Cheyalpattu, Chengalpattu
4	Dhanalakshmi Nursery Garden	Alagapuram , Tindivanam
5	Gopikarasi Nursery	Tailapuram, Tindivanam
6	K3 Nursery Garden	Kannigapuram , Villupuram
7	Sr Brothers Farms and Nursery	Devanurpudur, Villupuram
8	Greenway Nursery	Kallakurichi

KTH=Forest Farmer Group, KWT=Women Farmer Group

(a) (b) (c) (d)

Figure 12. Seed funding to 11 Farmer Groups in Banten province:194 (a) representatives of six farmer groups in Serang Regency, (b) representatives of five farmer groups in Pandegland Regency, (c) assistance received by KTH Tani Agung, (d) assistance received by KTH Pelangi. KTH is abbreviation for Farmer Group.

Figure 13. Distribution of nursery supplies to farmer groups in Mindanao, Philippines. *Left:* Simbalan-Mabungahon Workers Association, Buenavista; *Middle*: SONATA, Higaonon Tribe, Gingoog City; *Right:* Bukidnon Umayamnon Tribe Kapu-unan To Mga Datu (BUKDA), Bukidnon.

- **Recommendations for improving community-based seed supply for FLR**

  Baseline: Project countries have several initiatives around community nurseries, but we are not aware of other projects focusing on improving the genetic diversity and quality of produced planting material as a means to improve access to markets and premium pricing. *Change to date and evidence:* Recommendations were identified through capacity assessments, training workshops, stakeholder consultations, and the project's results workshop. The recommendations have been incorporated in the research manuscript about the project (Annex 5.1). Key recommendations include:

  - Access to and availability of native tree seed-related and FLR-needed information remain a challenge for restoration practitioners in the country and is exacerbated by the changing climate. Up-to-date species- and site-specific decision-support for restoration planning is required. Information systems and seed zones map are critical for decision-making related to forest and landscapes restoration as these tools would enable decision-makers and forest restoration implementers to identify areas without seed sources or those with limited numbers.
  - Coordination with institutions responsible in providing tree seeds and seedlings for restoration programs at the national and provincial levels plays an important role in identifying problems that need to be addressed and target participants for capacity building and seed funding.
  - Collaboration with local communities is a key ingredient to increasing the number of certified seed sources for native species. The public sector can play a key role in improving market linkages for small nurseries which bring quality seeds and seedlings to the market.
  - The process for seeds assessment, collection, production, testing and distribution needs to be refined to establish a unified registration process for monitoring and evaluating sources, enforce the use of quality seeds for raising plantations, and document seed zones and knowledge on which seeds can be grown. There is a need to revisit and assess the production capacity of the existing seed sources and decide on the species for which new seed sources have to be created.

3.2 Outcome

The expected outcome of the project was that *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*. The outcome was achieved, with many indicators of success significantly exceeded, thanks to strong buy-in from government institutions. The evidence is discussed below against the outcome indicators.

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

Maps of seed source availability were developed and integrated in three new information systems and one updated system on forest restoration (see section 3.1, Figures 2-4). All systems are managed by government agencies, demonstrating perceived value by governments. In India, the EIACP knowledge platform operates directly under the Ministry of Environment, Forest and Climate Change, providing excellent visibility, making high-quality planting material more accessible to stakeholders across the forestry sector and supporting more informed decision-making in forestry and conservation efforts.

In Indonesia, the information system received an Intellectual Property Right from the Directorate General of Intellectual Property (DJKI) at the Ministry of Law and Human Rights of the Republic of Indonesia (No. HKI.2.01.02.02-.006198/2025). The Ministry of Forestry has sent an official letter to have the information system merged into the Ministry's integrated information system (a letter from the Director of Greening and Forest Tree Seed, Ministry of Forestry number S.27/PPTH/PTH/DAS.01.03/B/04/2025 dated 24 April 2025). As part of the process, a trial of the use of the information system for Java Island was conducted in Kediri, East Java on June 25-26, 2025, with funding support from the Sengon Research Collaboration Centre, BRIN-IPB University. The trial was attended by around 30 participants who are representatives from central agencies (Directorate of Greening and Forest Tree Seeds, Forest Tree Seed Centres Region I, II, and III), local agencies from 4 provinces (UPTD SPTH in Banten, West Java, Central Java and East Java), and seed suppliers in East Java.

Number of FLR implementers with improved seed sourcing strategies (target: 30) (*Pre- and post-training reports, FLR project workplans on seed sourcing*)

194 FLR implementers (33% women), mainly from local government units, were trained in India, Indonesia and the Philippines (646% of target, Table 2). Examples of training reports are given in Annexes 5.6-5.10.

In India, a workshop held on the importance of sourcing quality native tree seed from local communities was viewed so successful by the Tamil Nadu Forest Department that it decided to scale up the initiative, resulting in a state-supported mass-training program for all forestry personnel involved in implementing the state's greening mission. With continued collaboration, IFGTB successfully facilitated twenty such training sessions across the state, reaching and equipping nearly 1,000 forestry personnel with knowledge on the significance of using quality seeds and seedlings of indigenous species.

Number of new seed sources identified by species, seed zone and land tenure (target: 9, of which at least 6 on communal or smallholder lands)

In total 11 new seed sources for 8 tree species in 5 different villages were identified in Indonesia and the Philippines (Table 3, 122% of target). All seed sources were on communal, indigenous or smallholder lands (183% of target). One seed source was already certified as a new seed source by the provincial authorities in Indonesia (Annex 5.5 Certificate of the seed source).

Number of forest-dependent men and women identified as potential seed suppliers and receiving seed funding and skills training (target: 30, >30% women) *(Field activity reports, participant interviews, financial records)*

166 community members (51% women) of 22 farmer groups and People's Organizations were identified as seed suppliers provided training and seed funding (Table 4, 553% of target).

Impact of trainings on three Forest Farmer Groups (KTH) was assessed in West Java, Indonesia: KTH Giri Jaya and KTH Kausar in Bandung, and KTH Tani Makmur I in Tasikmalaya (Figure 14). The assessments were conducted as focus group discussions on 6-9 January 2025, approximately 9 to 10 months after the trainings. The results showed that the training participants showed an increase in knowledge, changes in behaviour and changes in product quality. Training participants had become more aware of the process of handling seeds and seedlings and began to gradually practice it. Besides capital, marketing and limiter networks with potential buyers remain as the main challenges for the farmer groups. Trainings involving various farmer groups and distributors had helped participants to expand their networks but was not enough to significantly improve marketing.

Figure 14. Focus groups and interviews to assess the impacts of trainings on Farmer Group members, Indonesia.

3.3 Monitoring of assumptions

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

Assumption held: Related activities were successfully completed in Y1 and monitoring was ended.

Assumption 2: Staff with adequate background in data analysis are available for training and mentoring
Assumption held: Related activities were successfully completed in Y1 and monitoring was ended.

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

Assumption held. Consulted stakeholders, and especially government institutions in India and Indonesia expressed strong interest and support for the project activities, as evidenced by the exceeded training targets for forestry and restoration professionals. While the signing of contracts was delayed in three countries, this is due to administrative aspects only and no questions were 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

Assumption held and targets for training forest-dependent seed suppliers were exceeded by over five-fold, demonstrating the relevance and demand for project activities among beneficiary groups. All newly identified seed sources were also on communal, indigenous or smallholder lands.

4 Contribution to Darwin Initiative Programme Objectives

4.1 Project support to the Conventions, Treaties or Agreements

Project countries have extensive FLR targets, totaling over 49 Mha by 2030.

- India was among the first Asian countries to commit to the Bonn Challenge, with a 26 Mha restoration pledge. The country 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 Mha ha of degraded lands and restoring 2 Mha of peatlands by 2030 (Updated NDC, 2021).
- 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 newly launched *Forest for Life* programme of the Department of Environment and Natural Resources (DENR) targets planting of 5 million trees by 2028 and will require massive amount of quality seeds. 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.

The project supported the achievement of these policy goals by assessing gaps in seed availability for diverse environmental contexts, and helping to improve the availability of suitably 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). The project results also support countries in meeting the targets of the Kunming-Montreal Global Biodiversity Framework, which include maintaining and restoring the genetic diversity of native wild species to maintain their adaptive potential through *in situ* and *ex situ* conservation and sustainable management practices (Target 4). Seed zones can be used as proxies of local adaptation, and quality seed sources act as genetic reserves of specific species, and so the developed methodology for seed source gap analysis supports conservation assessments of genetic diversity and local adaptation (see Annex 5.1 for further discussion). Lastly, pilot species targeted for improved quality seed supply included *Aquilaria* and *Dalbergia* spp. listed in CITES Appendix II, supporting achievement of the Target 4 which makes specific reference to halting the extinction of CITES-listed species.

4.2 Project support to biodiversity conservation and multidimensional poverty reduction

The identified short-term targets (updated based on Change request CR23-059 to exclude in-country targets in Bangladesh) 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.

  Achieved: 13 individuals trained, with 6 women (46%)

- Forestry and FLR authorities in 3 countries have increased data and improved data management on native tree seed sources relevant to FLR

  Achieved: Seed zone maps were prepared (Figure 1) and gap analysis implemented. Results were integrated in four national information systems (3 new and 1 updated, Figure 2-4).

- 30 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.

  Exceeded: 194 local government staff and FLR practitioners (32% women) trained (646% of target).

- At least 9 potential new seed sources, of which at least 6 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.

  Exceeded: 11 new seed sources of 8 species identified (122% of target), all on communal or indigenous lands (183% target) (Table 3). Registration of one seed source was completed during the project (Annex 5.5)

- At least 30 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.

Exceeded: 166 community members (51% women) of 32 farmer groups and People's Organizations identified as seed suppliers in Indonesia and the Philippines, and provided training and seed funding (Table 4, 553% of target). Some training events included both indigenous peoples and local communities, and government and NGO representatives, helping to establish contacts and share information on seed or seedling markets.

Expected long-term changes, and project contributions:

- 400 rural men and women within and beyond the project's target districts gain jobs and income from tree seed collection and production

  Good progress: The project has reached 166 community members (51% women) of 22 farmer groups in India, Indonesia and the Philippines and strengthened their income generation opportunities through skills training and material support (Table 2, 4).

- 400 rural men and women within and beyond the project's target districts develop mutual trust through engaging in collaboration around sustainable forest management

  Good progress: The project results demonstrate the widespread shortage of tree seed sources required to meet national forest restoration targets and for local nurseries and seed enterprises to generate jobs and income. The seed source gap analysis demonstrated that in Mindanao, all current gaps in seed source availability for the project's pilot species could potentially be filled through collaboration with community forest management groups (Annex 5.1). Eleven new seed sources on communal or indigenous lands were already identified in 5 villages, providing opportunities for income generation from sustainable seed source management (Table 3). In Indonesia, the project activities were expanded from West Java province to Banten province due to strong buy-in from local authorities (Table 2).

- 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

  Good progress: The new online information systems of tree seed sources and suppliers in India, Indonesia and the Philippines (Figures 2-4) allow 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, directly supporting the national forest and landscape restoration goals. All information systems are managed by government agencies, demonstrating strong buy-in and scaling potential.

- 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

  Early progress: Gaps in the availability of seed sources as genetic reserves for eight threatened species (including 2 CITES Appendix II -listed species) were identified and communicated to forestry departments across four countries. Trained in-country experts from four countries successfully applied the analysis methods to in total 21 native species, setting foundation for expanding the analyses to additional countries. New seed sources were identified for four threatened tree species (*Aquilaria malaccensis* in

Indonesia and *Agathis dammara, Eucalyptus deglupta*, and *Pterocarpus indicus* in the Philippines) to support species conservation. Next, population surveys are needed to establish their quality to register them as seed sources.

- 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 (APFORGEN) through which the project was conceived.

  Good progress: Useful policy and legal frameworks for seed source management of native tree species were identified as learning opportunities, and incorporated in the regional strategy of APFORGEN (Objective 4) which was subsequently presented to the Asia Pacific Forestry Commission, the region's highest forestry decision making body, with 41 member countries. Project methods and early results were shared during the Annual Meetings of APFORGEN in 2023 and 2025, and a through a webinar on tree seed supply which received 80 attendees across the region and internationally. One expert from Lao PDR was trained to conduct gap analysis on seed source availability (with co-funding from CGIAR Trust Fund). Experts from Vietnam and Malaysia were invited to join the project's results workshop in Bandung, Indonesia, February 2024. The project's approaches were incorporated in a new funding proposal for Malaysia which subsequently received funding from the UK Mission to ASEAN. Gender Equality and Social Inclusion (GESI). Through collaborations established through the project, the Indian Council of Forestry Research and Education and the OECD Forest Seed and Plant Scheme initiated discussions on introducing tree seed certification in India.

GESI Scale	**Description**	**Put X where you think your project is on the scale**
Not yet sensitive	The GESI context may have been considered but the project isn't quite meeting the requirements of a 'sensitive' approach	
Sensitive	The GESI context has been considered and project activities take this into account in their design and implementation. The project addresses basic needs and vulnerabilities of women and marginalised groups and the project will not contribute to or create further inequalities.	
Empowering	The project has all the characteristics of a 'sensitive' approach whilst also increasing equal access to assets, resources and capabilities for women and marginalised groups	x
Transformative	The project has all the characteristics of an 'empowering' approach whilst also addressing unequal power relationships and seeking institutional and societal change	

Gender equity and social inclusion were relevant in the project particularly regarding three aspects: availability of seed for species prioritised by marginalised 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 marginalised 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. Our selected species include species that can be collected from the ground after seed dispersal, without requiring climbing trees (e.g. *Pterocarpus* spp. and *Dalbergia latifolia)*.

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. The project's targets for including at least 30% of women in training activities for both professionals and community members were exceeded in all cases. Training participants from communities who also decided on the seed funding needs were 48% women in Indonesia and 82% in the Philippines. A news article published in Inquirer.net in March 2024 highlights how tree seed production has improved incomes of rural Pilipino women and made them role models in their communities. The article tracks long-term developments but was inspired by this project, with interviews of project partner Mindanao Forest Tree Seed Centre and project leader Riina Jalonen.

The gap analysis methodology on seed source availability developed as part of the project allows identifying opportunities to fill in seed availability gaps through collaboration with community forestry groups. The results show how all seed source gaps of the project's pilot species in Mindanao could potentially be filled through engaging community forestry groups as seed suppliers (Figure 15; for details see Annex 5.1). All new seed sources identified in the field were on communal, indigenous or smallholder lands. A blog post published on the website of Bioversity International highlighted the role of Indigenous Peoples as custodians of forest biodiversity.

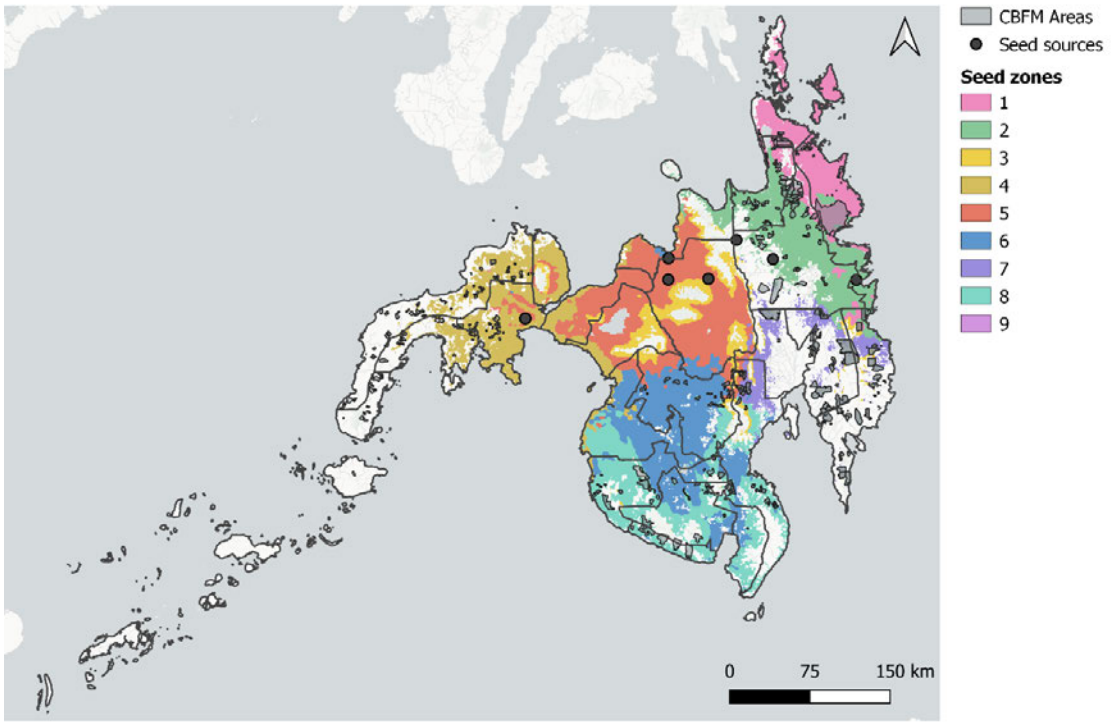


Figure 15. Using community-based forest management areas (shown as a grey overlay) to identify potential new seed sources (with *Pterocarpus indicus* in Mindanao, Philippines, as an example). The analysis shows that all gaps in seed source availability by seed zone for the species could be filled by community-managed forests.

4.3 Transfer of knowledge

The tree seed information systems developed through the project were adopted by government agencies in all countries. Useful policy and legal frameworks for seed source management of native tree species were identified as learning opportunities, and incorporated in the regional strategy of the Asia Pacific Forest Genetic Resources Programme of 15 countries which was subsequently presented to the Asia Pacific Forestry Commission, the region's highest forestry decision making body, with 41 member countries.

In the Philippines, the insights gained from the project's capacity-building activities, particularly in species distribution modeling, were incorporated in a related training module of the College of Forestry and Natural Resources, University of the Philippines Los Banos. The improved module has now been incorporated into the College's suite of training courses for practitioners and partner institutions. The methods have also inspired student work on practical applications of species distribution modeling in ecological risk assessment, with findings submitted to the Philippine Geomatic Symposium 2025.

For further details on knowledge transfer, see the discussion on the project's short-and long-term objectives in Section 4.2.

4.4 Capacity building

There was no specific change in the formal status of the in-country partners in their organisations. Two of the in-country partners were selected to the Board of APFORGEN in 2025, both female.

5 Monitoring and evaluation

The project had 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 (after update in Y2):

- 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: 30)
- Number of new seed sources identified by species, seed zone and land tenure (target: 9)
- Number of forest-dependent men and women identified as potential seed suppliers and receiving seed funding and skills training (target: 30, >30% women)

The M&E plan was revised in Year 2 with field-level output targets brought down by 25%, because the contract could not be signed with Bangladesh partner (Approved change Request No. CR23-059).

Bioversity International as the lead organisation was responsible to ensure M&E across all project activities and operations, and appointed a M&E specialist to guide the process. An Advisory Group on M&E between senior representatives of partner institutions was planned at the outset of the project, but could not be established given the long delays in signing the formal contracts with partners.

The project was selected by Defra for a spot check in March 2025, and asked to submit expenditure and receipts for the first six months of the financial year 2024-25. All requested documentation was submitted between March and April 2025. We have followed up but have yet to receive confirmation that the spot check was satisfactorily completed and closed.

6 Lessons learnt

- Activities affirmed the value of regional collaboration and exchange of experiences in developing seed systems for native tree species. Partners in Indonesia and Philippines shared information about the functionalities and architecture of the Tree Seed Information Systems that they were developing, allowing building in best practices. The results workshop that was held in Bandung, Indonesia, in March 2024, also allowed other countries to learn about Indonesia's experiences in organising tree seed systems. The project partners are members of the same regional network, APFORGEN (www.apforgen.org) and know each other for several years, which contributed to an atmosphere of mutual trust and collegiality between partners from the outset, key for sharing of experiences especially in multi-country projects.
- Adoption of project results and tools faced setbacks in both Indonesia and the Philippines, when leadership in key stakeholder institutions changed. Strong initial progress was halted and relationships had to be rebuilt. New leaders often come with their own agenda and priorities, which may not match with ongoing initiatives. This highlights the importance of building institutional capacities, so that progress is not lost when individuals move on.
- The project budget did not include staff cost for national partners, as they work for government research institutes and universities and are already fully paid. However, this arrangement added to the workload of the partners without easy access to assistants for implementation. Future proposals should pay special attention to the workload and adequate staffing, including assistants, at public sector partner institutions, to ensure activities and implementation schedules are feasible. Arrangements for hiring complementary staffing at some partner organisations differed from donor regulations, with some partners having budgeted them as operational costs, which prompted an additional Change Request in February 2024 to reallocate funds between budget lines.
- Year 2 ended with some unspent funds in India, where the national project team was working hard to catch up with implementation schedules after the delays with the sub-contract. Several trainings planned for March could not be implemented after national elections were announced and project staff were called on election duty as government officials. In the final year of the project, subcontracts were scheduled to end a month earlier than the project, to avoid risks of underspending.

7 Actions taken in response to Annual Report reviews

Comments for which response was requested with this annual report:

Detail the specific measures taken to ensure the sustainability of seed sources and their impact on local communities' livelihoods.
The identified seed sources in Indonesia are under review to confirm their production potential, as a prerequisite to their certification. One of the seed sources has already been certified (Annex 5.5). In the Philippines, the identified seed source on Certified Ancestral Domain was added to the publicly accessible database of tree seed suppliers, managed by the Mindanao Forest Tree Seed Centre, to facilitate market linkages.

Report on the progress of establishing and maintaining documentation on seed origin, quality, and supply as outlined in the project objectives.
This information is incorporated in the new information systems in each country. The information systems are managed by government agencies in each country, increasing sustainability.

Increase the proportion of project staff and stakeholders receiving formal safeguarding training.
We could unfortunately not pursue this during the project extension, as it was not budgeted for.

8 Risk Management

There were no new risks in the last 12 months of the project. Earlier in Y2, a significant change was made to the project design when it was concluded that it was not realistic to expect that the sub-contract with the Bangladesh partner could be signed due to substantive delays. The funds reserved for contracting the partner were reallocated for organising the results workshop (approved Change Request CR23-059). The partner continued to participate in the project through activities that could be carried out without a subcontract (trainings, workshops and desk studies).

9 Scalability and Durability

The project was designed to reduce 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. These institutions typically have a mandate to help translate research results into practice which directly supports scaling. For example, IFGTB, the Indian project partner, is mandated to provide capacity strengthening for the State Forest Departments, which offers an established pathway to adoption and scaling. In Indonesia, the project team worked from the outset 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, and with the Regional Technical Implementation Units (UPTD) under the Governor in West Java and Banten. Thanks to this approach, the project's methods and results have already been scaled in several of the countries as follows:

India: A Memorandum of Understanding was between the Ministry of Environment, Forest and Climate Change through the Indian Council of Forestry Research and Education, and the project lead Bioversity International. The new EIACP knowledge platform on tree seed supply operates directly under the Ministry, providing excellent visibility, making high-quality planting material more accessible to stakeholders across the forestry sector, and supporting more informed decision-making in forestry and conservation efforts. Tamil Nadu Forest Department has demonstrated high interest for the project, hosting training events and sending staff of the Tamil Nadu Green Mission to attend trainings. A workshop held on the importance of sourcing quality native tree seed from local communities was viewed so successful by the Tamil Nadu State Government that it decided to scale up the initiative, resulting in a state-supported mass training program for all forestry personnel involved in implementing the state's greening mission. With continued collaboration, the Institute successfully facilitated twenty such training sessions across the state, reaching and equipping nearly 1,000 forestry personnel with knowledge on the significance of using quality seeds and seedlings of indigenous species.

Indonesia: Very strong support for project activities was received from the central government (Directorate of Forest Tree Seeds), local government (West Java and Banten Forestry Departments) as well as farmer groups who manage community-based nurseries. Representatives of the central and local government attended the project's result workshop in Bandung, West Java, in February 2024, and the local government hosted workshop participants during field visits. Project activities in supporting local communities in seed supply were subsequently scaled from West Java to Banten province thanks to strong demand from the Banten Forestry and Environment Service. The Tree Seed Information System developed by the project was endorsed by the Directorate of Forest Tree Seeds and institutional processes are currently underway for its nationwide adoption. The System has received an Intellectual Property Right from the Directorate General of Intellectual Property (DJKI) at the

Ministry of Law and Human Rights of the Republic of Indonesia. The new Ministry of Forestry is expected to adopt the system as part of its one-stop integrated information system on forest data. As the first step, the system is being trialled by involving five provinces in Java and the Directorate in the Ministry of Forestry starting June 2025.

Philippines: The project collaborated closely with the Mindanao Forest Tree Seed Center in improving the Center's information systems and organising trainings. Collaboration was also established with DENR regional offices for collecting data for species distribution modelling, development of seed zone maps, seed source maps and suitability maps. The insights gained from the project's capacity-building activities, particularly in species distribution modeling, were incorporated in a related training module of the College of Forestry and Natural Resources, University of the Philippines Los Banos, which is now being offered to practitioners and partner institutions.

Bangladesh: Memorandum of Understanding was signed with the Ministry of Environment, Forest and Climate Change, to support the implementation of the project, adoption of its results and follow-up activities. Nevertheless, signing of the sub-contract for project implementation did not progress in Y2, and because of constraints to rebudgeting project funds, a decision was made to drop the in-country activities. Staff of the Bangladesh Forest Department continued to be actively involved in project ctivities that didn't require formal contract, such as trainings and desk studies.

Lessons from the project influenced the revision of the Regional Strategy of the Asia Pacific Forest Genetic Resources Programme (APFORGEN). The updated strategy was presented to the Asia-Pacific Forestry Commission in October 2023 (Figure 16). The project's approaches were incorporated in two project proposals submitted to UK Pact and the UK Global Center on Biodiversity for Climate. Both projects were approved, resulting in the mobilisation of over £2 million of additional funding (more than 11 times the original grant value) to scale the approaches and methods to other geographies.

Figure 16. Dr Rekha R. Warrier, the project's country coordinator for India, presenting the emerging project results to the Asia Pacific Forestry Commission at the Commission's 30st Session in Sydney, October 2023.

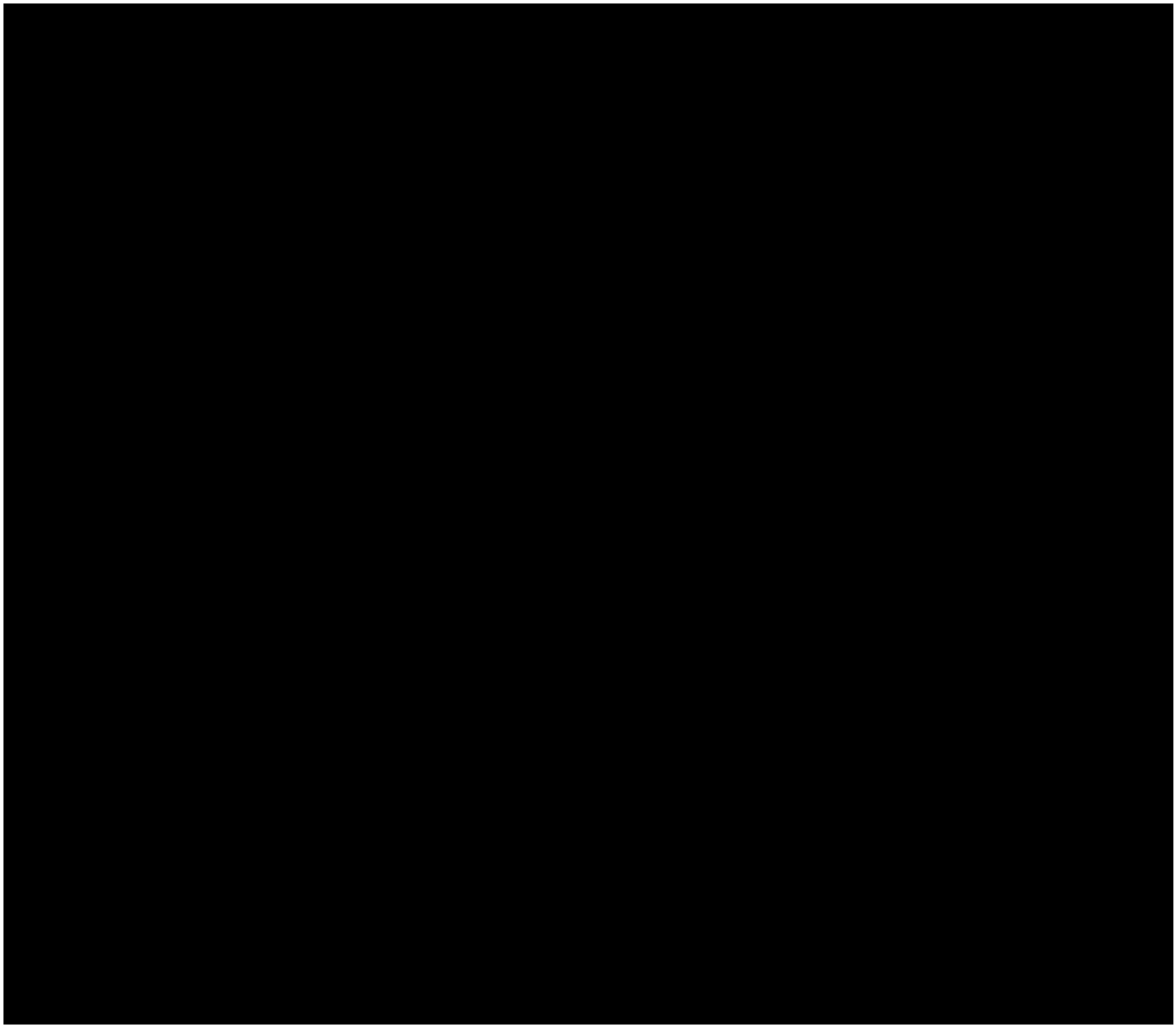
10 Darwin Initiative identity

Darwin Initiative and UK government logos were used in all major events related to the project. List of the in-country training events is provided separately in Table 3. The main project-level and regional events are listed below.

- Hybrid webinar on Organising Tree Seed supply for Forest and Landscape restoration, March 2023 (part of a larger programme)
- Hybrid webinar on the Role of Forest Tree Seeds in Supporting FLR in Bogor, Indonesia, July 2023 (part of a larger programme)
- Results workshop of the project in Bandung, Indonesia, February 2024 (distinct identity for Darwin). The project and the workshop were featured in a blog post on Bioversity International's website and in the social media campaign for the International Day of Forests 2024.
- Panel discussion of the project results and lessons learned at the Annual Meeting of APFORGEN, May 2025.

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).

11 Safeguarding



[redacted]

12 Finance and administration

12.1 Project expenditure

Project spend (indicative) since last Annual Report	2024/25 Grant (£)	2024/25 Total actual Darwin Initiative Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)	[redacted]			
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items (see below)				
Others (see below)				
TOTAL	24,408.16	23,688.22	[redacted]	**N/A**

Staff employed (Name and position)	Cost (£)
N/A	
TOTAL	

Capital items – description	Capital items – cost (£)
N/A	
TOTAL	

Other items – description	Cost to BCFs (£)
Towards refilling toner in printer paid to M/s Infogates, Coimbatore Inv. No.221 dated 01.07.24, Inv. No.220 dated 01.07.24, Inv. No. 218 dated 29.06.24 and Inv. No. 219 dated 29.06.24.	[redacted]
Towards Purchase of drum unit (for copier) paid to M/s Powerplay Imaging Solutions, Coimbatore Inv. No.PPIS/2024-25/297 dated 26.06.24	
Towards Repair of printer and purchase of cartridge paid to M/s Vijex Office Product, Coimbatore Inv. No.V/C/1625/24-25 dated 06.07.24 and Inv. No.V/C/1689/24-25 dated 10.07.24	
Towards AMC of Toshiba copier machine paid to M/s Powerplay Imaging Solutions, Coimbatore Inv. No.PPIS/2024-25/190 dated 29.05.24	
Towards purchase of headphones to M/s Appario Retail Pvt. Ltd, Coimbatore vide Inv. No. FCJA-10452 dated 19.06.24	
Towards Replacement of SMPS of the system vide Inv. No. V/C/1882/24-25 dated 19.07.24 of M/s Vijex Office Product, Coimbatore	
TOTAL (Must match Others total in Section 2)	

12.1 Additional funds or in-kind contributions secured

Matched funding leveraged by the partners to deliver the project	Total (£)
FY1, 2022/23	[redacted]
FY2, 2023/24	
FY3, 2024/25	
TOTAL	

Total additional finance mobilised for new activities occurring outside of the project, building on evidence, best practices and the project	Total (£)
Seed to Tree: Value Chains and partnerships for resilient restored forests (UK FCDO, UK Pact Malaysia / ASEAN UK Green Transition Fund, grant code: 301495)	[redacted]
BREL-Borneo: Benefits of Biodiverse Restoration for Ecosystems and Livelihoods in Borneo (UK FCDO, The Global Centre on Biodiversity for Climate, grant code: RG2-008989; led by the Royal Botanic Garden Edinburgh)	
TOTAL	

12.2 Value for Money

The project was excellent value for money. Strong buy-in from local governments allowed scaling activities and exceeding many of the project targets manifold (see section 3.2). The project results such as the information systems in all countries and the training curricula in India were adopted by government agencies. Substantial additional funding of over 11 times the grant value was mobilised to continue the work beyond the project.

13 Other comments on progress not covered elsewhere

Nothing to report.

14 OPTIONAL: Outstanding achievements of your project (300-400 words maximum). This section may be used for publicity purposes

I agree for the Biodiversity Challenge Funds to edit and use the following for various promotional purposes (please leave this line in to indicate your agreement to use any material you provide here).

Three new information systems on tree seed for restoration were developed, and one existing mobile platform was updated, to improve restoration practitioners' access to information on native tree seed availability. All information systems are managed by government agencies. In India, the new EIACP knowledge platform on tree seed supply operates directly under the Ministry, providing excellent visibility, making high-quality planting material more accessible to stakeholders across the forestry sector, and supporting more informed decision-making in forestry and conservation efforts. In Indonesia, The tree Seed Information System developed by the project was endorsed by the Directorate of Forest Tree Seeds and institutional processes are currently underway for its nationwide adoption. The System has received an Intellectual Property Right from the Directorate General of Intellectual Property (DJKI) at the Ministry of Law and Human Rights of the Republic of Indonesia. The new Ministry of Forestry is expected to adopt the system as part of its one-stop integrated information system on forest data. As the first step, the system is being trialled by involving five provinces in Java and the Directorate in the Ministry of Forestry starting June 2025.

In India, Tamil Nadu Forest Department demonstrated high interest for the project, hosting training events and sending staff of the Tamil Nadu Green Mission to attend trainings. A workshop held on the importance of sourcing quality native tree seed from local communities was viewed so successful by the Tamil Nadu State Government that it decided to scale up the initiative, resulting in a state-supported mass training program for all forestry personnel involved in implementing the state's greening mission. With continued collaboration, the Institute successfully facilitated twenty such training sessions across the state, reaching and equipping nearly 1,000 forestry personnel with knowledge on the significance of using quality seeds and seedlings of indigenous species. In Indonesia, very strong support for project activities was received from the central government (Directorate of Forest Tree Seeds), local government (West Java and Banten Forestry Departments) as well as farmer groups who manage community-based nurseries. Project activities on capacity strengthening and supporting local communities in seed supply were scaled from the original target province West Java to Banten province thanks to strong demand from the Banten Forestry and Environment Service.

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)
Image	Annex 5.11	Over 160 farmers were trained in the production of quality native seedlings for forest and landscape restoration. Pictured are training participants from Giri Jaya Forest Farmers' group, Indonesia	Indonesian Partner BRIN: • Instagram: @ brin_indonesia, @ekologietno_brin Bioversity International: • Instagram: @bioversityciat • LinkedIn: Alliance of Bioversity International and CIAT: Posts | LinkedIn • X: @BiovIntCIAT_eng	Explicit concern not collected

Annex 1 Report of progress and achievements against final project indicators of success for the life of the project

Project summary	Progress and achievements
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	
Outcome indicator 0.1: National or sub-national maps and databases on the availability of seed sources for native species (target: 4)	Achieved: 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 (Section 3.1, Figure 1, Annex 5.1, 5.3).
Outcome indicator 0.2: Number of FLR implementers with improved seed sourcing strategies (target: 30)	Exceeded: 194 implementers trained (33% women) (646% of target) (Section 3.1, Table 2)
Outcome indicator 0.3: Number of new seed sources identified by species, seed zone and land tenure (target: 9)	Exceeded: 11 seed sources across 5 villages in Indonesia and the Philippines (122% of target). All seed sources were on communal, indigenous or smallholder lands (183% of target). (Section 3.1, Table 3)
Outcome indicator 0.4. Number of forest-dependent men and women identified as potential seed suppliers and receiving seed funding and skills training (target: 30, >30% women)	Exceeded: 166 community members (51% women) trained and provided seed funding in Indonesia and the Philippines (553% of target) (Section 3.1, Table 4)
Output 1 Identified gaps in seed source availability for native species in four countries	
Output indicator 1.1 Availability of gap analysis methodology	Achieved, reported in research manuscript for high-impact factor journal, Annex 5.1-5.3
Output indicator: 1.2 Number of experts trained and skilled in gap analysis methods, by country and gender (target: 12, >30% women)	Achieved: 13 experts trained (46% women), reported in workshop report
Output indicator 1.3: Availability of species distribution, seed zone and seed source maps (target: 20 native species)	Achieved: Distribution maps for 21 species, seed zone maps in 4 countries, reported in Annex 5.1-5.3.
Output 2. Improved access to information about seed sources and seed origins by forestry authorities and FLR implementers	
Output indicator 2.1 Validated priority maps and databases on the availability of seed sources	Achieved: Distribution maps for 21 species, seed zone maps in 4 countries, reported in Annex 5.1-5.3.
Output indicator 2.2 Number and type of recommendations made and implemented for improving data management on seed sources and seed origins	Achieved: Three new and one improved information systems established, Section 3.1, Figures 2-4.

Project summary	Progress and achievements
Output indicator 2.3 Manual on gap analysis methodology and online catalogues on seed sources	Achieved, detailed methodology reported in research manuscript for high-impact factor journal, Annex 5.1-5.3 (under review for *Ecological Indicators*). Seed zone maps are available on APFORGEN website. All maps and data analysis scripts will be published in Dataverse upon acceptance of the manuscript for publication (estimated by end of 2025)
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: 90 stakeholders)	Exceeded: Capacities of 403 stakeholders assessed (448% of target), Section 3.1.
3.2 Number of FLR implementers trained, by country and gender (target: 30, >30% women)	Exceeded: 194 implementers trained (33% women) (646% of target) (Section 3.1, Table 2, Annexes 5.6-5.10)
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: 9 of which at least 6 on communal or smallholder lands)	Exceeded: 11 seed sources for 8 species across 5 villages identified in Indonesia and the Philippines (122% of target). All sources were on communal or smallholder lands (183% of target). (Table 3)
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)	Achieved: Needs identified through workshops and approx. £6020 of seed funding distributed to in total 22 community groups (Table 4)
4.3 Recommendations for improving community-based seed supply for FLR	Achieved: Recommendations identified through workshops and stakeholder consultations and incorporated in the research manuscript (Annex 5.1)

Annex 2 Project's full current indicators of success as presented in the application form (unless changes have been agreed)

DARCC-006: Strengthening collaborative tree seed supply systems for restoration in Asia

	SMART Indicators	Means of Verification
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 sets of maps, 3 databases) 2. Number of FLR implementers with improved seed sourcing strategies (target: 30) 3. Number of new seed sources identified by species, seed zone and land tenure (target: 9) 4. Number of forest-dependent men and women identified as potential seed suppliers and receiving seed funding and skills training (target: 30, >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
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 2.3 Manual on gap analysis methodology and online catalogues on seed sources 2.4 Regional results workshop to communicate good practices and reflect on lessons learned	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 2.5 Workshop report and Insight note
Output 3. Improved understanding of seed quality considerations and	3.1 Capacity needs assessment for improving the supply of and demand for quality seed among FLR implementers,	3.1 Reports and records of capacity Assessment

community roles in sourcing native tree seed among 30 FLR implementers in 3 countries	forest-dependent communities and other stakeholders (target: 90 stakeholders) 3.2 Number of FLR implementers trained, by country and gender (target: 30, >30% women)	3.2 Pre- and post-training assessments of knowledge, skills and attitudes
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: 9 of which at least 6 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
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: Please describe up to 6 key assumptions that, if held true, will enable you to deliver your Outputs and Outcome

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	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	People	130M, 64F	42	125	69	194	92
DI-A03	Number of local/national organisations with improved capability and capacity as a result of project	Number	N/A	6	13	3	22	9
DI-A04	Number of people reporting that they are applying new capabilities (skills and knowledge) 6 (or more) months after training.	People	7M, 6F	13	13	-	13	42
DI-B01	Number of new/improved habitat management plans available and endorsed	Number	N/A	-	5	6	11	9
DI-B02	Number of new/improved species management plans available and endorsed	Number	N/A	4	-	-	4	4
DI-B07	Number of people participating in community-based management groups and/or Payment for Ecosystem Service schemes	People	83M, 85F	-	118	48	166	30
DI-C03	New assessments of habitat conservation action needs published	Number	N/A	-	-	(1) under review	-	1
DI-C13	Number of webinar attendees	People	Gender disaggregation not available	80	480	-	560	60
DI-C15	Number of Media related activities.	Number	3 newspaper articles, 2 blogs	3	9	2	14	5

Table 2 Publications

Title	Type	Detail	Gender of Lead Author	Nationality of Lead Author	Publishers	Available from
Strengthening Tree Seed Supply System for Forest and Landscape Restoration: Good Practices, Lessons Learned, and Collaboration Opportunities	Report	Lee Y, Galeon AP, Jalonen R. 2024	**F**	Philippines	Alliance of Bioversity and CIAT, Penang, Malaysia	www.apforgen.org/fileadmin/user_upload/Darwin_Results_Workshop_Report_-_March24.pdf
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, Warrier R, Yuskianti V, Tolentino jr E, Tiburano jr C, Jalonen R, 2022	M	Belgian	Alliance of Bioversity and CIAT, Penang, Malaysia	www.apforgen.org/initiatives/strengthening-seed-supply/activities
Technology for Handling Seeds and Seedlings of	Book	Sudrajat DJ, et al. 2022	M	Indonesian	Deepublish publisher	See Figure 10 for picture of the book.

Title	Type	Detail	Gender of Lead Author	Nationality of Lead Author	Publishers	Available from
Potential Species for Forest and Landscape Restoration in Indonesia (Teknologi Penanganan Benih dan Bibit Species Potensial untuk Restorasi Hutan dan Lanskap di Indonesia, in Bahasa Indonesia),						
Identifying Restoration Bottlenecks: A Gap Analysis for Native Tree Seed Sources in Tropical Asia	Research article	Jalonen R, Fremout T, Warrier R, Yuskianti V, Tolentino jr E, Tiburan jr C, Md. Zahidur Rahman Miah, Md. Tauhidor Rahaman, Wilkie P, Sudrajat DJ, Denny, Kettle CJ	F	Finland	Elsevier	Under review for *Ecological Indicators* (IF: 7.1). Available in Annex 5.1

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.	
Is your report more than 10MB? If so, please consider the best way to submit. One zipped file, or a download option, is recommended. We can work with most online options and will be in touch if we have a problem accessing material. If unsure, please discuss with BCF-Reports@niras.com about the best way to deliver the report, putting the project number in the Subject line.	Yes
If you are submitting photos for publicity purposes, **do these meet the outlined requirements (see section 14)?**	
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
Have you provided an updated risk register? If you have an existing risk register you should provide an updated version alongside your report. If your project was funded prior to this being a requirement, you are encouraged to develop a risk register.	Yes
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.	