

Darwin Initiative Main: Annual 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: 30th April 2024

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Darwin Initiative Project Information

Project reference	29020
Project title	Strengthening community capacity for evidence-based forest restoration in Indonesia
Country/ies	Indonesia
Lead Partner	UKCEH
Project partner(s)	BRIN, Fauna & Flora, KKI Warsi, Plan Vivo, University of Kent
Darwin Initiative grant value	£524,473
Start/end dates of project	June 2022 – March 2025
Reporting period (e.g. Apr 2022 – Mar 2023) and number (e.g. Annual Report 1, 2, 3)	April 2023 – March 2024; Annual Report 2
Project Leader name	Lindsay F Banin
Project website/blog/social media	https://www.ceh.ac.uk/our-science/projects/forest-restoration-indonesia
Report author(s) and date	LF Banin, K Olsen, N Berry, K Bohannon, S Budiharta, E Damayanti, L Hughes, J Hutabarat, K Kazlauskis, D Kiswayadi, M Massie, D Muenzel, E Primadona, Radinal, E Raine, M Roddini, E Schoof, M Struebig, H Tittensor, F Yusuf & M Williams 30 April 2024

1. Project summary

Overview: *Tropical forest restoration is considered a major route to mediating the biodiversity and climate crises whilst also supporting livelihoods and well-being of local communities. To meet these aims over the long-term, restoration actions must be effective and sustainable while benefiting people. Our project will co-produce and apply methods that foster a strategic, evidence-based approach to forest restoration in Indonesia, facilitating i) spatial prioritisation, ii) restoration interventions, iii) efficient restoration monitoring and iv) a route to certification for ecosystem service-based finance.*

Intact tropical forests are carbon-rich, productive and diverse. Land-use change and resource extraction have degraded these functions in many parts of the tropics while large areas of forest have been lost completely, with consequences for native plant diversity and wildlife habitat. Forest

restoration and rehabilitation presents an opportunity for the ‘triple-win’ – positive outcomes for biodiversity, climate change mitigation and people and this has been encapsulated in the UN Decade on Restoration. However, restoration outcomes can strongly diverge, with many projects hindered by short funding cycles, insufficient long-term planning and challenges around delivering the monitoring to determine their success. Notably, projects that fail to empower local communities in their own land governance often fail to secure long-term success in restoration, particularly where local residents cannot derive or access benefits. Forest-dependent peoples make up a notable proportion of Indonesia’s population, and thus forest condition and human well-being are tightly connected. Projects can also fail if too few or inappropriate plant species are selected, and opportunities to meet multiple objectives are missed.

To date forest restoration has strongly focussed on tree planting, with less attention on assisted natural regeneration and long-term maintenance of regenerating stems. Determining the most appropriate interventions in a given location enables more efficient use of resources while supporting the capacity for regional species to be conserved and to recolonise. Similarly, strategic spatial planning could help to maximise outcomes for forest cover, biodiversity and poverty and allow a joined-up approach between different project areas and stakeholders. This incorporation of restoration objectives into the broader needs of landscape planning could be central to minimising further habitat degradation and land-based carbon emissions while enhancing the movements of threatened wildlife over the longer term.

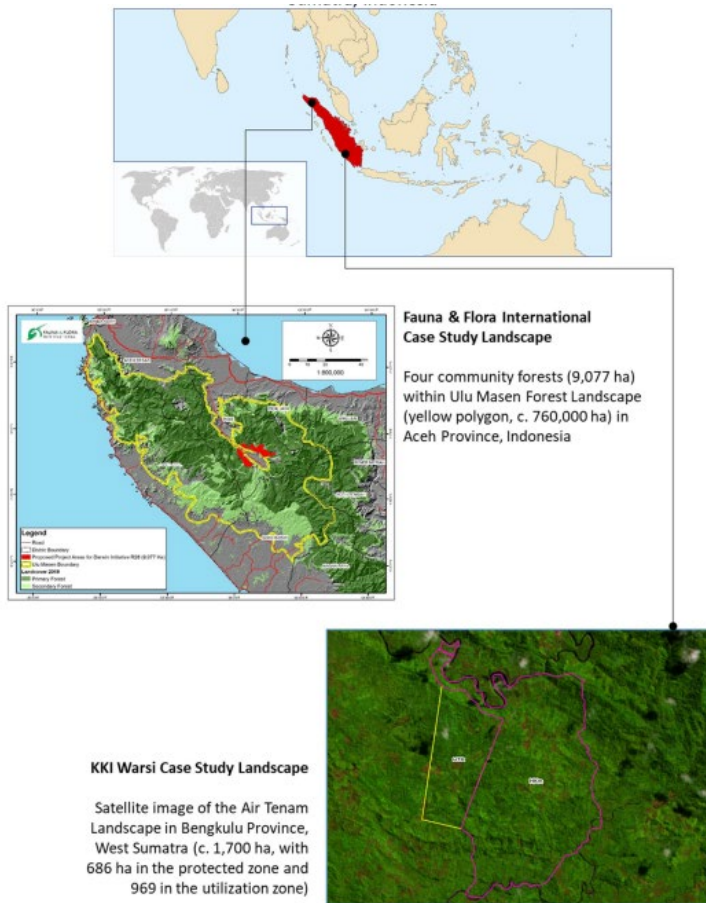
One of the main challenges discussed globally in the context of restoration is making it scalable. Our project considers the whole pathway, from restoration area planning, to implementation, monitoring and income generation, providing a model approach which could be applied in other locations worldwide. The project is designed to be self-sustaining by formulating a process through which local communities can derive livelihood, well-being and economic benefits. Local land-users often select economically important tree species when bringing degraded lands back into a tree-dominated system. Payments for Ecosystem Services (PES) may allow land-users to diversify and access another revenue stream, bringing economic resilience and stability, whilst allowing for more biodiverse tree communities.

One of the key criticisms of forest restoration is the lack of involvement, agency and benefit-sharing of local communities, whilst social factors have been identified as important drivers of restoration outcomes. Our project works within the Plan Vivo model of ensuring that restoration is guided by the needs of local communities and we test mechanisms for using forest restoration as an approach for deriving ecosystem service and economic benefits to local communities, contributing to the poverty alleviation aspect of the ‘triple win’.

The Indonesian Government introduced a moratorium on clearing primary forests and has committed to reducing carbon emissions by 29–41% by 2030, through its nationally determined contributions (NDCs). The deforestation trend has declined since 2015, but there are still large gaps between pledges, targets, implementation and successful outcomes, an issue that has been identified across the tropics. Our project focuses on two social forestry project landscapes, in two provinces (Aceh and Bengkulu) on the Indonesian island Sumatra (Fig.1). Some of our activities are applicable to the whole of Sumatra and Indonesia, and tropical forest regions more broadly, as we consider opportunities and challenges for scaling up forest restoration activities (e.g. spatial prioritisation; cost-benefit and market analyses; restoration certification methodology).

Our identification of these key challenges and knowledge gaps came from 1) a published synthesis of restoration outcomes and an in-depth knowledge of the tropical/SE Asian forest literature (Banin et al. 2023), 2) in-country knowledge from the project partners, 3) a recent Darwin Initiative Main Grant project on effectiveness of community forest policy in Indonesia and 4) Plan Vivo knowledge of the current status of policies, practice and certification methodology and markets.

Figure 1: Map of the project’s two focal landscapes on Sumatra, Indonesia



2. Project stakeholders/ partners

All project partners contributed to the development of the proposal, to ensure that the project outputs reflected in-country needs, and these are represented in our four high level outputs (restoration planning; implementation; monitoring; income generation). Key examples are: spatial prioritisation to allow for strategic restoration decision-making and local-scale spatial planning for restoration activities, provision of nursery and seedling materials and knowledge around propagation and maintenance for on the ground implementation, resource efficient monitoring processes, improved understanding of the market and income generation potential through different methodologies to assess project viability, and support through Plan Vivo project development and certification processes (see Logframe). The project governance, with different organisations leading/co-leading the four work packages has largely worked well, distributing responsibilities effectively (see Proposal).

We have sustained an excellent collaborative partnership through year 2, through monthly full-project team meetings (first Thursday of every month) and frequent bi-lateral/multi-partner meetings for more detailed discussions on particular activities, which have enabled ongoing monitoring and evaluation. These were consolidated through in-person workshops and a field-site visit in Indonesia in February-March 2024, which enabled deeper understanding of current opportunities and challenges in the restoration activities and cross-fertilisation of lessons learned at the two restoration sites, whilst further reinforcing our co-working relationships. Language barrier challenges have been overcome by using closed-captions in online meetings, live translation by multi-lingual meeting participants and written communications which can more easily be translated.

Both project areas and in-country teams have established excellent relationships with local communities in Bengkulu and Aceh. Prior to the start of the project, community land management rights had been secured. NGO partner representatives are embedded in the communities and they host regular meetings and training as described in activities progress. The project team have successfully engaged important stakeholders, in particular, the province-level government departments including forest management and watershed management units. As part of this ongoing engagement, representatives attended workshops in Indonesia in March 2024 (Annex 0.1). This was valuable because we were able to get their feedback on the programme of activities and how learning from the project could be expanded to new project areas, following a similar model.

We secured a letter of support from Dan Montgomery-Hunt at the British Embassy, Jakarta for the project (see proposal letter of support) and we provided an update to Triny Tresnawulan via an online presentation on 14 November 2023. The Darwin project lead was invited to attend Biodiversity Challenge Funds: Partners Learning Forum in Jakarta 19 February 2024 but unfortunately it was not possible to attend due to travel arrangements. The team organised a ‘teach in’ with Embassy staff after the Eid celebrations (in Year 2) with the view that this could develop into a more formalised partnership as the embassy plans its biodiversity strategy for the years ahead. FFI hosted a meeting with Triny Tresnawulan and Melati Melati of the British Embassy in Jakarta, March 2024, to discuss research needs, opportunities and barriers to the application of biodiversity credits for conservation and restoration in Indonesia (Annex 0.2).

New collaborations have been established with researchers and academics at Indonesian universities, IPB, UI and University of Bengkulu. Project lead LFB has been invited to deliver a lecture on forest restoration at the IPB University Summer School following the seminar delivered during the recent visit in February 2024. We have strengthened collaborations with research scientists at BRIN through research applications, opportunities for PhD student co-supervision and the development of a longer-term partnership agreement between UKCEH and BRIN.

Plan Vivo has been in several discussions over the last year with various parties (Rabobank, project partners based in Indonesia, UNDP) to better understand the process for recognition for the PV Climate Standard which would allow projects certified under PV Climate to generate carbon credits. Following a meeting with UNEP in February 2024, the route to approval has become clearer. Johan Kieft, adviser to UNEP, has been involved with several sub-ministries of the Ministry of Environment and Forestry (MoEF) to design the national and international system for voluntary carbon trading (further details under Project Progress.).

3. Project progress

3.1 Progress in carrying out project Activities

Our project activities are largely on track in accordance with our Implementation Plan.

Output 1: Restoration Planning

National-to-regional scale: In Year 1, datasets were collated and a workflow developed for assessing trade-offs and synergies in biomass protection/recovery and biodiversity protection resulting in a spatial prioritisation tool for forest restoration Indonesia, as well as some more detailed analyses conducted at the provincial level for the case-study areas in Aceh and Bengkulu (Activity 1.2). In year 2, we began disseminating the results of our spatial prioritisation framework via a presentation at the Trees for Climate Change, Biodiversity and People symposium organised by the British Ecological Society (June 2023). The presentation was attended by a range of practitioners, academics, and policy-makers working in forest restoration across the globe (Annex 1.2). We also ran a practical workshop to teach participants how to implement the methods of the prioritisation, which was attended by a range of staff and students at the University of Kent where the symposium was held. In Sumatra, we introduced stakeholders in Bengkulu province to the tool during a workshop held in Bengkulu city in March 2024, involving representatives from local government and university departments (Annex 0.1).

Based on feedback provided by various audience and team members, we updated the interactive, web-based app which we started to develop in year 1 to increase its accessibility and usability - the app now allows users to select between either forest restoration or forest conservation scenarios; the project sites of Air Tenam and Ulu Masen can be visualised on the interactive map to provide a spatial reference; the colour scheme was updated to improve interpretation (latest version found at: <https://darwinforestrestoration.shinyapps.io/Sumatra/> ; Activity 1.2).

The work is currently in preparation for a peer-reviewed publication (Indicator 1.2). Nationally, the role of restoration is important in the context of NDCs; we plan to have further stakeholder engagement and feedback sessions at the provincial and national level on the prioritisation outcomes in year 3.

Landscape scale interventions planning: The Warsi team (Bengkulu landscape) have continued their engagement work with the local community to identify customary land parcel ownership and usage, drivers for shifting cultivation, and defining boundaries of the ‘protection zones’. The team have gained local forest management unit support to enforce these boundaries, articulated during

stakeholder meetings in Bengkulu (March 2024). Discussions on the protection zones have been supported by high-resolution remote sensing analyses on forest condition. The remote sensing study was presented as a poster at the Trees for Climate Change, Biodiversity and People symposium organised by the British Ecological Society (June 2023) (Activity 1.3/4; Annex 1.3), and the team have been invited to contribute a peer-reviewed paper to a special issue centred on the conference in Ecological Solutions and Evidence. This work was also presented to stakeholders in March 2024 (Annex 0.1). The UKCEH team are monitoring existing and newly-emerging remote sensing products and how they can be applied to monitoring forest cover change, and how these may feed into the Plan Vivo restoration methodology tools.

In Aceh, community meetings held in February 2023 (Year 1) involving 16 landowners (15 males and 1 female) determined landowner involvement in restoration activities and key decisions around the restoration activities in the Lutueng Village Forest. The tree species prioritised by the community were MPTS species such as Durian, Avocado, Petai (*Parkia speciosa*), and Jengkol (*Archidendron pauciflorum*). All land users consented to participating in restoration activities. In addition to planting MPTS species, the meeting also agreed on RTE tree species to be planted at the boundary between land owned by different users in the restoration area, such as Meudang (*Magnoliaceae spp*), Meuranti (*Shorea spp*), and Seumantok (*Shorea spp*; *Parashorea spp*) (see further details under Output 2 Activities). In June 2023, the F&F team (Aceh landscape) conducted additional site-identification work which identified new potential restoration areas in the Lutueng, Blang Dalam and Mane village forest areas within the project rehabilitation zone (Activity 1.3/4; Annex 1.4a). Based on field assessments, four locations spanning 33 hectares were identified as new restoration areas, involving 20 land users. However, in Mane village forest, no land users were identified, requiring further identification efforts. Additionally, meetings with local stakeholders (LPHD, provincial watershed management) were conducted to update restoration and nursery activities supported by the project, and potential new restoration areas were discussed based on field assessments. We plan to determine the new restoration areas will be determined through consultation with LPHD and the landowners in Year 3.

In Aceh, restoration training (maintenance and pest control methods), took place in Turue Cut village, with tree maintenance practices conducted in the restoration area (Activity 1.5; Annex 1.5). The activity occurred on September 24, 2023, with 22 participants, including 16 males (1 female landowner was unable to attend the training and her family who helped plant trees in the restoration area replaced her). We also invited stakeholders to participate in this training, including 4 people from the village government and 2 people from the mukim government. Hamdani, S.Hut, delivered training on procedures for maintaining and controlling pests and diseases on MPTS trees, which included advice around root protection and avoiding rot, and advice around appropriate techniques for grass removal and fertilizer application. Following this, practical sessions involved tree maintenance tasks such as clearing grass around trees, applying fertilizer, and checking for pests and diseases. At the end, fertilizer assistance was provided to land users in the restoration area. Additionally, participants were informed about the abundance of natural fertilizers available in nature, emphasizing their effectiveness for plantation activities in the village forest area. From the training, landowners learnt that it is very important to maintain existing trees as shade for MPTS trees, as this will increase the likelihood of trees growing.

Output 2: Restoration Action

Nursery establishment, planting, monitoring and maintenance in rehabilitation zones: During the period of April 2023 to March 2024, in Aceh, the project supported the cultivation of 22,000 seedlings across four nursery locations: Lutueng, Blang Dalam, Mane, and Turue Cut villages (Activity 2.1; Annex 2.1a). Unfortunately, 7,200 seedlings perished due to pests and diseases, leaving a total of 14,800 seedlings, comprising 8,500 petai (*Parkia speciosa*) seedlings and 6,300 robusta coffee seedlings. The project also supported nursery materials (nets, poly bags) and the community provides the labour. Monitoring of planted trees in the restoration area was conducted in November 2023 by a trained team of 10 people (6 men 4 women; Annex 3.4a). From the monitoring results, the team successfully recorded 2,677 trees out of approximately 6,000 planted. Of these, 1,702 trees (63.58%) were found to have died, while 975 trees (36.42%) remained alive, including 915 petai trees, 11 jengkol trees, 43 durian trees, and 6 avocado trees (Monitored in November - data file and coordinates and photos. Replanting in March). Only 100 trees were replanted in March 2024 due to dry weather conditions, with the remaining replanting activities postponed to prevent tree mortality. Future planting locations will be determined after discussions with land users to

ensure their commitment to tree maintenance, and we will explore adaptations to management and maintenance practices to support higher survival rates.

In Bengkulu, the nursery was established in year 1 and 9829 seedlings have been distributed to be planted in 31 land parcels, 28 land parcel owners – these were made up of 1176 durian, 721 jengkol/stinky bean, 7932 pinang/betel nut (Activity 2.1). Between October 2023 and January 2024, monitoring has been undertaken on the planted MPTS trees. There has been a strong focus on extension and community engagement for regular maintenance and monitoring. Survival rates are on average 96%, ranging from 81% to 100% across land parcels (Activity 2.2; Annex 0.3).

Building native and rare, threatened and endangered forest species into restoration zones:

The project team in Aceh are currently working together on plans for incorporating rare, threatened and endangered (RTE) and native species of value into restoration plantings (Activity 2.1/2; Annexes 2.1b and c). The team have conducted surveys up to 3km from the village forest boundary with the assistance of a local botanist and have so far identified 34 individuals (four taxa, including *Dipterocarpus* spp., *Shorea* spp. and *Magnolia* spp.) for regular monitoring for flowering/fruitletting so that seeds can be harvested (photos, coordinates, data; Annex 2.1c). These species were selected as they are local endemics, are known to be threatened, and have historical-cultural value to the communities since they have been used to construct traditional houses. The regular monitoring is assisted by the local SMART patrol team, rangers who assist in the identification of illegal activity. Throughout three monitoring sessions, no indication of fruiting or flowering was observed. Following discussions with the botanical team, it was determined that monitoring should be conducted every 3-6 months. During the tree wilding survey, the team gathered 400 saplings from the *Beilschmiedia* genus, known locally as Meudang Puteh. After spending approximately seven months in the nursery, 300 Meudang Puteh trees were transplanted to the restoration site, while the remaining 100 perished. Besides Meudang Puteh, we also tried to collect pioneer tree seedlings from around the restoration area, expecting that these trees would be planted around the MPTS trees as protective shade cover trees and to assist with later survival rates of shade-tolerant native species. However, the pioneer tree saplings that were collected died; based on discussions with the botanical team, this can be a common response in uprooted pioneer trees (see also Lessons Learned section). Next year, we will collect pioneer tree fruits and propagate them in the nursery. Additionally, RTE tree seedlings were collected by the SMART Patrol team during patrols in the Ulu Masen landscape. At least 70 tree seedlings were obtained from this activity, and they are likely to belong to the *Dipterocarpaceae*, *Anacardiaceae*, and *Sapindaceae* families. Identification remains challenging due to the small size of the saplings. The trees will be nurtured at the nursery in Lamlo, Sakti Sub-district until they grow to at least 1 metre in size and the tree species will be identified. The tree planting will be implemented within the Lutueng village forest restoration area. However, the specific location for the planting still needs to be discussed and agreed with the landowner.

In year 3 we will further explore the opportunities for assisted natural regeneration (ANR) and extension around the benefits of shade trees in the landscape to identify if there is support for incorporation of more native forest trees into the agroforestry areas, enhancing the ecosystem function and biodiversity potential in these areas.

Output 3: Restoration Monitoring

Faunal biodiversity monitoring: Liam Hughes joined the project in October 2023 as a PhD student co-supported by the ARIES doctoral training partnership. His focus will be on the role of habitat quality in determining faunal populations, helping to improve understanding of how restoration can support animal conservation in multi-use landscapes and the metrics that can be used to track change over time. A camera trap survey was deployed in the Bengkulu landscape January – September 2023 at 40 locations on a 1 km grid (Activity 3.5; Annex 3.5). There were some data capture challenges as discussed in Annex 3.5 and the data capture may be repeated. Images were tagged in January to February 2024 and yielded 396 independent captures. Preliminary results show that a total of 25 medium- to large-bodied mammal species (>1kg) were identified across the entire survey. Of these, 19 species were detected within the social forestry area. This included 10 species considered as globally threatened or Near Threatened IUCN Red List. An additional four globally threatened species were detected in the watershed protection forest

but not the social forestry area. In Aceh, from 16 March to 5 April 2024 two teams deployed camera traps across the Hutan Desa in Mane and adjacent watershed protection forest. A total of 45 cameras were deployed within the social forest and 16 deployed within the watershed protection forest on a 1 km grid. Additional camera trap deployments have previously been undertaken within the watershed protection forest within the last 9 months and thus will also be used for the control data. The cameras will remain in situ for at least 60 days and collected in June 2024, after which camera images will be tagged by the Kent and F&F teams in collaboration and a baseline assessment of the faunal populations can be made (project Year 3).

Vegetation monitoring: In Aceh, training on planted tree measurement and data sheet completion was conducted in Turue Cut village on 9 November 2023, aimed at enhancing the local community's monitoring skills in the restoration area (Annex 3.3). Ten youths, comprising 6 men and 4 women, participated in the training, where they practiced independent measurements and data sheet completion procedures. A work team was formed during the training, and it was agreed that the survey would take place from 16-25 November 2023 (as described under Output 2).

Last year, baseline vegetation survey was carried out in the planted areas in Aceh prior to planting. Several areas within the rehabilitation zone in Aceh were co-agreed to be left to provide a natural regeneration baseline, to assess opportunities and barriers to spontaneous forest recovery and compare the arrival of spontaneously establishing saplings between planted and natural regeneration areas; this year a tree vegetation survey was carried out in these areas of the Lutueng village forest over 2 days, covering four 50 m x 100 m survey plots (Activity 3.4). The survey was conducted by F&F with the participation of 2 individuals from the Lutueng village community (Annex 3.4c). The plots were randomly located, but some adjustments were made to avoid a cliff area - the new location of the survey plots can be viewed on the map image of the survey area. From the 4 plots surveyed, 2 of them had trees, while the other 2 were grassland/waterlogged areas, thus lacking vegetation and only having scrub plants. The plot survey resulted in the recording of 36 individuals from 20 species and 11 families.

In Bengkulu, community members have undergone training to monitor planted seedlings using the KARLON mobile app, which also enables them to record evidence and access payments for surviving seedlings. It is important that planting of agroforestry areas is not detrimental to existing native forest trees in the landscape. To secure other existing trees in the landscape, baseline monitoring was conducted within the 31 land parcels that currently form the project area to record both agroforestry and native trees (Annex 3.4b). Non-MPTS species were found to be rare within these land parcels. Plot-based monitoring will be undertaken in Year 3 in the protection zones. This will help identify a baseline for carbon and plant biodiversity in these areas for the Plan Vivo PDD and identify potential opportunities for ANR and/or seed/seedling sourcing for expanding populations of native forest species, after engagement with the community in Year 3.

Mobile application development: Year 1 activities focussed on app design, culminating in a mock-up. Our app will be named TR3. The work in Year 2 has been around honing the details of the app's data capture functionality, including a flexible, plot-based monitoring module and production of relevant exports and data summaries. This has been achieved through several small-group design meetings and literature based research. We have sought advice and researched data transfer and storage requirements. There has also been focus on producing an appropriate plant species list tailored to the Indonesian region. We downloaded and extracted the plant species checklist data for Indonesia from the World Checklist of Vascular Plants <https://powo.science.kew.org/> using R Studio 2023.06.2. We then used the taxon name from the WCVF species checklist dataset to extract the Catalogue of Life and Global Biodiversity Information Facility data for each species via the Global Biodiversity Information Facility API (Catalogue of Life checklist [Catalogue of Life Checklist \(gbif.org\)](https://www.catalogueoflife.org/) and Global Biodiversity Information Facility taxonomic backbone dataset [GBIF Backbone Taxonomy](https://www.gbif.org/)). We have also been working on the mathematical functions that will be used to derive summaries of key structural, diversity and biomass metrics from the tree-by-tree data.

In terms of technical development, the following activities have been achieved:

1. We have designed and implemented the mobile app backend database. We've designed it to be flexible, so it handle a wide array of survey data types. This flexibility ensures our app can adapt to various research needs without requiring extensive redesigns. Our database supports longitudinal studies by allowing data from multiple surveys over time to be linked. We've also incorporated spatial query capabilities, enabling the analysis of data based on

geographical locations. Additionally, our database can manage binary files for survey inputs to include images and other media.

2. Our backend infrastructure is now fully operational, hosted on a managed database service based in London. Opting for a managed service means we benefit from high availability, automatic backups, and scalability, which are handled by the service provider, allowing us to focus more on development and less on infrastructure management.
3. We have developed the mobile application framework with a focus on integrating both custom-built and off-the-shelf components, support future translations. The core requirement in building the framework was to support offline-use and enable surveying without network connection.
4. We have set-up a continuous integration (CI) pipeline that helps streamline our development process. This CI pipeline automates the testing and deployment of new code and reduces the risk of errors and improves the quality of our software. Additionally, we have set-up and integrated the app with the Android Play Store.

Capacity building and app training will now be undertaken in year 3 to support local use of the app and iteration of app features (Activity 3.3) - this is slightly delayed from the implementation plan because of slightly longer research and design phases required than anticipated (particularly due to challenges of working remotely from the stakeholder teams) and a UKCEH staff member change. In Year 3 we also plan to broaden the stakeholder input to check the scalability of the app to other Plan Vivo project users.

Output 4: Restoration income generation

Carbon credit trading policy context: Over the last year of reporting (April 2023-April 2024), several 'circulars' and 'position papers' have clarified Indonesia's position towards carbon trading and have clarified rules and regulations around how projects can proceed to operate on the Voluntary Carbon Market (VCM). It is now very likely that Indonesia will endorse third-party Standards, including Plan Vivo's Climate Standard, rather than developing its own Standard. Although Indonesia finalised carbon regulations guiding domestic and international carbon trading and levies in October 2022, uncertainties and unknowns remain (see further details under Outcome indicators). While the focus of the currently published carbon regulations is to achieve the country's NDC commitments, the outlook for VCM credits is more positive. Nevertheless, each project will have to seek authorization from the government to become/continue to be operational and will have to register on the Sistem Registri Nasional (SRN) to get their activities approved. Projects can adopt approved methods listed on SRN to seek project approval. On a Standard level, each Standard will have to seek 'mutual recognition' from the Ministry of Environment and Forestry (MoEF), meaning Standards will have to be approved by MoEF to demonstrate they are aligned with Indonesia's carbon regulations. Plan Vivo has been in several discussions over the last year with various parties (Rabobank, project partners based in Indonesia, UNDP) to better understand the process for recognition for the PV Climate Standard which would allow projects certified under PV Climate to generate carbon credits. At this point, it looks like all credits would be traded on the national registry rather than on a third-party international registry for carbon credits.

Discussions that have taken place included:

- Calls with project developer Paul Burgers who operates the Gula Gula project in Indonesia to get clarity from a project perspective (May 2023);
- Several calls with local consultant Elyn Damayanti to understand the current status of carbon regulations (monthly meetings from April 2023 – April 2024);
- Contracting of consultant Chris Stephenson to look into and write report into approval process (April – June 2023);
- Contacting of Secretary of Emissions Reductions (no response) and secretary of Indonesian Trade Organisation (no response);
- Meetings with ACORN/Rabobank and UNEP (Feb 2024).

Following a meeting with UNEP in February 2024, the route to approval has become clearer. Johan Kieft, adviser to UNEP, has been involved with several sub-ministries of the Ministry of Environment and Forestry (MoEF) to design the national and international system for voluntary carbon trading. It has been suggested that Plan Vivo register on the SRN and submit its current [Forestry and](#)

[Agroforestry Methodology](#) for approval. The process for mutual recognition of the Standard should become clearer over the coming months.

Plan Vivo is currently in the process of submitting its methodology to the SRN – several issues were encountered such as not having an address in Indonesia. Enquiries have been made to the SRN and contacts provided by UNEP to verify whether we can proceed with the registration on the SRN as an international entity.

Activities to develop restoration methodology (Activity 4.3/4): Initial meetings of the Restoration Methodology Working Group (WG) convened in Q4 of 2022 (details provided in previous annual report), chaired by methodology module developer Nick Berry. Participants in the Working Group included representatives from CEH, academics at the University of Edinburgh, Conservation agencies such as the Third Millennium Alliance, and project representative from ACORN, Climate Labs, KKI Warsi and Ambio. It was decided in those Working Groups that the current Forestry and Agroforestry Methodology would need a revision of module PU001 to account for assisted natural regeneration (ANR) or agroforestry that does not result in a change in land use. As part of this revision, the actual module and the associated tools 1 and 2 (Tool 1 – Dynamic baseline approach for assessment of increases in woody biomass from forest restoration; Tool 2 – Tree-based approach for assessment of carbon benefits from tree planting) would need revision.

As per Plan Vivo procedures, a concept note for the revised restoration module was submitted by Nick Berry to the Plan Vivo secretariat and Technical Advisory Committee (TAC) to kick off the approval process in Q3 of 2023 and was reviewed by the Plan Vivo Technical Review Panel, a panel of technical experts contracted by Plan Vivo to undertake reviews of new methodologies and technical approaches who have not been involved in the development of the methodology, by Q4 of 2023 (Annex 4.4a & b). One Future Action Request (FAR) was raised which requested that the final methodology provide more details on equations not presented in the concept note. Following the successful submission of the concept note, a Working Group meeting was held in Jan 2024 to discuss a revised version of PU001 and the introduction of a new tool PT#### with Guidance for Use of Models in PV Climate Projects. With these two documents, the WG aimed to address the approach for estimating baseline changes in woody biomass in forest restoration projects using empirical and process-based models, as well as approaches for estimating baseline changes in woody biomass in forest restoration projects using conservative default values. The Working Group has provided feedback, and the final changes are currently being incorporated into a final version which will be submitted to Plan Vivo for review and approval by mid-May 2024.

Communicating the biodiversity credit (PV Nature) methodology: The Plan Vivo biodiversity credit methodology, PV Nature, launched publicly in December 2023. Harry Tittensor presented an overview of the methodology during the project monthly project meeting in August 2023 attended by representatives of KKI Warsi, F&F, UKCEH, and University of Kent. This was supplemented with another training workshop during the visit to Jakarta in February 2024 (Annex 4.5a). We held a day-long discussion at UKCEH in November 2023 to understand the methodology more deeply and to consider opportunities for the Indonesian project areas and the opportunities to conduct 'sensitivity' around different levels of data acquisition for faunal biodiversity monitoring.

Plan Vivo Process (PIN/PDD development): In our last annual report we noted our intention to bring forward some decision-making on the Plan Vivo methodology that would be followed by F&F and KKI Warsi, if they decided to develop their project areas as Plan Vivo projects. Both organisations decided to pursue the development of a Project Idea Note (PIN) for their project areas. The PIN is a document that outlines the project and intention to become a Plan Vivo certified project and demonstrates basic eligibility with the Plan Vivo Carbon Standard. This involved initiating activities on the PIN development aspect of Output 4 early (in Year 2 as opposed to Year 3), allowing better alignment between Darwin project indicators and the monitoring methodology required for the Plan Vivo certification process. One particular area of discussion and development has been around defining counterfactual areas and how to monitor those or alternatively generate appropriate, robust assumptions, and some of this work is still ongoing.

KKI Warsi had a 1:1 call with Plan Vivo Project Officer (PO) Harry Tittensor, receiving further help with PIN development in Jakarta and Bengkulu (in situ in Feb/March 2024). This involved key discussions on the Air Tenam project's planned interventions, and whether they would be more

suitable PV Nature (biodiversity credit methodology) or PV Climate (carbon credit methodology). KKI Warsi decided to proceed with PV Climate, which they collectively decided was more aligned and suitable for their planned interventions and project activities. This led to further adaptation of the Air Tenam PIN, completed by Roddini from KKI Warsi (Annex 4.5b).

Further training led by the Darwin team - including CEH, Kent University KKI Warsi and Plan Vivo - took place with community members in Air Tenam, Bengkulu. Amongst other reasons, this took place to ensure that strong progress indicators were in place to monitor the project's impact on biodiversity and restoration across the project area. This will feed into the PDD (project design document) biodiversity impact progress indicators, once the PIN is approved. This session took place at the start of March in the Air Tenam village. Finally, post the site visit in Bengkulu, it was recommended to KKI Warsi and community members that additional mitigation measures were put in place for the newly constructed road in Air Tenam (pictures in one drive). This has now been done, and an updated version of the second iteration of the PIN has been resubmitted (Annex 4.5b). KKI Warsi, are close to completing their PIN for Air Tenam - their first submission took place in October 2023; the first submission was a strong first iteration, and the first round of feedback was given by Plan Vivo secretariat on 16/01/2024. The main points of the PIN evaluation were that the project needed to decide on an appropriate methodology and approach. The KKI Warsi team reconvened and added mitigation measures and the update of the second iteration of the PIN included additional plans for biodiversity uplift monitoring and indicators, thus, being more closely aligned with the Darwin Initiative program's overall aims (17th April 2024). This followed discussions in Bengkulu between CEH, Kent University, KKI Warsi and Plan Vivo at the start of March. The second iteration of the Air Tenam PIN was submitted on 17th April and now awaits evaluation from the Plan Vivo secretariat. Prior to a full review it is the Plan Vivo secretariat's view that this PIN is 90% complete and near completion.

F&F Indonesia had two calls with PO Harry Tittensor on PIN development, this was also supported by recommendations during the scheduled monthly Darwin team meetings. Prior to the team meeting in Jakarta, Ellyn Damayanti (TLLG), working on behalf of Plan Vivo, visited the F&F Aceh project site, putting together a comprehensive report on the status of project development. Ellyn visited the Aceh site from 21st to 25th of February 2024 with the main objective of assessing progress against Plan Vivo project development and assessing progress on objectives within the Darwin Initiative activities (in lieu of a full team visit to Aceh, due to sensitivities around the General Election). She held meetings with Community Representatives from Mane, Blang Dalam, and Turue Cut Villages. During her trip, Ellyn also provided guidance on completing the PIN in focused sessions with Radinal the F&F project coordinator lead.

F&F chose to go with PV Climate, also viewing it as more suitable for the proposed project's intervention. During project team workshops in Jakarta (March 2024) F&F with Harry's support completed a draft of the PIN; the full draft is due to be submitted by F&F to the Plan Vivo team for further review in May 2024. Overall, this is great progress running ahead of schedule.

3.2 Progress towards project Outputs

A key goal of our project is to develop aspects across the full 'restoration workflow', from restoration planning to action, monitoring and income generation, which are reflected in our four outputs. We have made good progress in all outputs in year 2 of the project, with a particular focus on land-use mapping (Output 1), restoration implementation (Output 2), app development (Output 3) and developing standard methodologies and elements of the certification process (Output 4).

Output 1: Restoration Planning – *Co-produced spatial prioritisation and community land management & intervention plans for two project areas and improved local capability for delivering restoration with multiple objectives*

We consider restoration planning activities at several spatial scales. We are conducting analyses for strategic spatial planning at the national and provincial level (Indicator 1.1-1.2) and landscape scale spatial planning of interventions with community involvement (Indicator 1.3-1.4). From meetings with provincial stakeholders in Year 1 (Indicator 1.1) we learnt that the baseline condition was that some spatial analyses are being used to prioritise restoration sites, but these typically focus on the needs for erosion and flooding prevention and may not necessarily take into account biodiversity, carbon gain potential and social factors in a multi-objective analysis, identifying a gap for assessing synergistic opportunities for restoration. To the best of our knowledge, the baseline condition is that

spatial prioritisation is not being used to strategically plan restoration at the national level to optimise multi-objective outcomes. We have made significant progress with an open-source spatial planning tool (Annex 1.2, linked under Section 3.1) and in forthcoming stages of the project we plan to re-engage with stakeholders and restoration project developers to get feedback on the approach and understand how stakeholders would like to bring the tool into their decision-making processes. We will explore routes for the tool to be used to identify additional communities/landscapes referred to in our 'legacy' plan, liaising with key stakeholder groups tasked with expanding restoration in Indonesia's social forestry system.

The baseline condition of the landscape-scale spatial planning at Air Tenam was that project partner KKI Warsi had initiated community engagement and the community had agreed in principle to allocating part of the social forestry area to protection and retain other areas for agroforestry production (coffee, durian and other MPTS species). The KKI Warsi team had begun to map land parcels with associated land ownership, but there were no methods in place for defining the protection zone and processes to monitor change over time. In year 2 we finalised a ground-truthed landcover mapping workflow and product (Annex 1.3) to serve three purposes, 1) to work with the community to define the protected forest zone, 2) establish representative baseline and ongoing monitoring locations and 3) develop methods to track project impact over time. The land-mapping also allows us to explore the opportunity to generate income from natural regeneration/assisted natural regeneration. We have used open data and software, using reproducible methods, with the ambition that the methods could be applied by in-country organisations in the future, raising capacity and autonomy for spatially-explicit restoration planning and monitoring. We have also identified some important challenges in mapping from remote sensing in complex forested landscapes. With the landcover mapping exercise close to completion, we are now well-positioned for developing the co-agreed community land management plans (Indicator 1.4) and a scaleable workflow benefitting other project areas.

In Aceh, the baseline condition was that the community forest (hutan desa) boundaries had already been agreed in a community land management plan, which included defined forest protection and rehabilitation zones. We therefore focussed restoration plans on these rehabilitation areas and the community garden areas which are outside the boundary of the community forest area but act as an important buffer to the protection zone. Local scale restoration planning in this landscape required checking through drone survey, ground-based spot checks and discussions with the local communities to understand current land-use, to inform decisions as to appropriate interventions. A total of 478 aerial photos were captured by drones, then all photos were combined to produce high-resolution imagery. According to a mutual agreement by evaluating the images captured, restoration area was determined around ± 24 ha, where previously only ± 15 ha was determined by BPDASHL. Some of the areas within the demarcated rehabilitation zone are waterlogged with an uncertain land-use history, and are not suitable for tree planting currently. Some areas are also currently used as grazing land. The scale of the areas available for planting at the Aceh site may not be as large as originally conceived and we are adapting targets and recognising opportunities in the broader Ulu Masen landscape where the greater goal is to enhance overall landscape connectivity.

Training and input from botanists and agricultural specialists, initiated in year 2 and continuing in year 3, will help to ensure a sustainable legacy for restoration planning and activities that generate long term success within the project landscapes (Indicator 1.5)

In sum, co-produced restoration plans and associated methodology are progressing well, and we anticipate that we are likely to achieve the output by the end of the project.

Output 2: Restoration Action - *Two project areas with seedlings planted, protected and/or maintained*

The baseline condition in the two project areas was that there was no functioning tree nursery at either site. As outlined in section 3.1, this output is on track to deliver because nurseries have been established and MPTS seedlings have been distributed and planted, with support through the in-kind provision of seedlings from local stakeholders (BPDAS) (Indicator 2.1 & 2.2). Local communities are incentivised to maintain the planted MPTS seedlings because they will yield current and future economic return; this will contribute to success of the restoration areas and support other protection activities within the landscapes. Training and extension have occurred in both landscapes to support positive tree survival and rehabilitation outcomes. In both landscapes, we continue to explore opportunities to enhance the spatial extent of the impact – additional ground-

check surveys have been undertaken in Aceh and in Bengkulu, identification of land parcel owners is ongoing. In Bengkulu, training and financial incentivisation for survival of planted trees has been particularly effective, whilst there have been some challenges around survival in the Aceh landscape where ongoing efforts for site selection, landowner engagement, seed sourcing and maintenance methods will be adaptively managed to support positive outcomes.

In both landscapes, areas of good condition forest have been designated as protection zones, with excellent local support – in Aceh, this was decided in the community land management plan prior to the initiation of the Darwin project. In Bengkulu, the forest protected zone has been agreed amongst the community participants, using a landcover map created within the project.

The incorporation of native and RTE species into plantings (Aceh) has been a larger focus of year 2 efforts (Annexes 2.1-2.2). There has been some success in raising wildings of certain taxa (*Beilschmedia sp.*; other taxa waiting full identification) whilst seed supply or seedlings survival has been challenging for other taxa (Dipterocarpaceae mother trees; native pioneer species, respectively). Further activities are required to build capacity and capability to propagate native forest species in the Aceh site. Seeing the value of this approach, the Warsi team are interested in gauging interest with the local communities in Air Tenam to integrate native/RTE species in different parts of their project area and explore with the village community which species they value culturally. Improved understanding of the phenological patterns of local species and regular monitoring would support these processes.

Output 3: Restoration Monitoring - *Mobile-based application enabling robust and efficient monitoring of restoration objectives, developed for use in community-managed forests*

Our mobile application design process is largely on track to deliver as planned. Through a review of existing, related mobile applications for tree/forest monitoring, we determined that the baseline condition was that a number of useful tools exist, but no single mobile application met all the monitoring needs of forest restoration projects in social forestry systems in Indonesia, and likely tropical forest restoration projects more broadly. Our user needs assessment identified some key design parameters and the priority modules for the applications data capture (Indicator 3.1). We are currently working to finalise the beta version of the app which we hope to achieve in Year 3 Q1. We will track our progress on app development through the following steps: a) final, functioning beta version of app and within-team iteration, c) external-to-project workshops and feedback, d) delivery of open-access mobile application. We plan to use our year 3 field visit to conduct some training and feedback sessions on the application, which will help to ensure the app meets user needs. We will also be able to track data entry and app use, allowing us to measure how the app features are being used.

Plot-based forest inventories are used at both the Aceh and Bengkulu landscapes to establish the vegetation baseline prior to restoration activities (Indicator 3.4). These plots will be re-surveyed through the project and beyond to quantify biomass and plant compositional change (Indicator 3.4). Our survey methodology uses plots with a nested design which capture the structure and composition of trees in different size classes, which helps develop understanding on recruitment of seedlings and saplings and therefore forest recovery. At the site in Aceh, the initial baseline survey was conducted on Year 1, March 2023 with additional baseline plots in natural regeneration areas conducted in Year 2 (see Section 3.1).

In Bengkulu, we have conducted detailed ground check points to record land-use and forest condition to support the production of a landcover map. This provided valuable information about the initial site condition. Monitoring of other tree vegetation within land parcels where MPTS tree planting has taken place was conducted in Year 2. Plot-based baseline surveys have not yet been conducted in Bengkulu (see Section 3.1) but now the landcover map is complete and protected zone defined, it will be possible to establish permanent plots to facilitate a more detailed understanding of the plant communities in the landscape and how protection of areas of the forest may help to support plant diversity conservation and restoration.

We intend that when the mobile app development is at an appropriate stage, it can be used to record plot re-surveys and we can evaluate whether this supports the partner teams and communities in recording data more efficiently.

Provincial stakeholders were also interested in the mobile tool, demonstrating potential for broader use of the app once it is developed and we still plan to engage some broader stakeholders (project

developers/leaders; forest management units) once the beta version is finalised, to understand how the app can be applied outside of the current Darwin project areas.

Output 4: Restoration Income Generation - *Model to incentivise communities through income generation from restoration is developed and available to community-managed forest PES projects.*

The baseline condition for this output was that community driven PES projects were under threat due to the restrictions on carbon trading in Indonesia and that there was currently no viable alternative such as biodiversity crediting or a PES model specifically designed to support restoration activities. In the first year of the Darwin project, we built a good understanding of the rapidly evolving biodiversity credit market (market analysis; Indicator 4.2) and of the cost implications of alternative PES models (Indicator 4.1). Further progress has been made in year 2 on developing a restoration monitoring methodology that can be approved under the Plan Vivo Standard (Indicator 4.3). The review and approval for this module is on track to deliver in Year 3 of the project, and once approved, will help to ensure projects can generate credits and benefits from restoration activities in the future.

The biodiversity credit methodology (PV Nature) was launched during 2023, with pilot projects currently trialling the approach. This gives projects flexibility in choice, which may help projects where there is a delay in bringing carbon credits to the market. The project is therefore on track to deliver, bringing a selection of income models into practice and communicating these options to the operators in the two focal landscapes. This progress has enabled the project areas to start drafting their PINs – we are on track for the PINs to be completed during the Darwin project and PDDs in development, which will see the project areas well-progressed in terms of the Plan Vivo certification process and their ultimate ability to draw economic benefits if approved by external reviewers.

During the year, efforts to ensure a viable route to PES finance has been ongoing, through both PV Nature (which has been launched and developed by pilots) and efforts to gain recognition for PV Climate under the Government of Indonesia's new carbon trading rules and regulations. In addition, Plan Vivo is also developing a PES route that is not reliant on generating discrete credits, and this may also be an option for these projects, or similar projects in the near future.

A notable factor in project decision-making is that the project running costs can sustainably be met by generation of income from the chosen model. The cost-benefit analysis in year 1 highlighted:

- Projects focussing on 'restoration' interventions such as agroforestry, afforestation and reforestation tend to have higher costs per hectare than projects with stronger protection/ conservation focus i.e. REDD+/ avoided deforestation projects. For restoration projects, low intervention approaches (such as assisted natural regeneration) also tend to be less expensive than agroforestry and afforestation interventions; extra data on (A)NR efficacy will be beneficial, but these efforts needs to be recognised and valued properly.
- Although Plan Vivo projects also deliver biodiversity outcomes, to different degrees, the costs of low-intensity or vegetation biodiversity monitoring in projects are currently not a significant component of costs (over and above monitoring required for carbon measurements). Whilst Plan Vivo Nature monitoring costs are anticipated to be higher due to the number of metrics, these may not be significant over and above current monitoring costs – once project capacity and expertise has been built. Use of technology and enabling projects to build local capacity for robust biodiversity monitoring provide key opportunities to reducing costs. PES projects could reduce costs by leading on developing/ using methodologies that are community-led to a greater extent, for example. The PhD studentship affiliated to the Darwin project may examine accuracy of a range of indicators using rapid vs technological data collection methods (started in Year 2, continuing in Year 3).

3.3 Progress towards the project Outcome

As we are on track with project activities and outputs, the project is showing great potential for delivering on its overall outcome of *'high-quality and sustainable ecosystem restoration is delivered on social forestry and degraded forest land in Aceh Province and Bengkulu Province delivering*

climate, biodiversity and socio-economic co-benefits'. During the second year, we have focussed particularly on spatial intervention decision-making, on-the-ground implementation, gaining a deeper understanding of community needs and motivations which will enhance multi-objective outcomes, community training, app development and continuing with other underpinning activities which will support the longer-term success of strategic planning, monitoring and methodology for income generation. (We would like to note that during our February/March 2024 in-person workshops we liaised on updating our logframe which we will be submitting for review imminently).

Outcome Indicator 0.1

Project partners (FFI and KKI Warsi) have conducted socialisation activities around sustainable land management practices (Indicator 0.1) in two social forestry areas (in Aceh and in Bengkulu) and communities are engaged and showing good commitment, which is fundamental to the achievement of the outcome. Surveys of the two community forest areas have been conducted using remotely sensed data, ground checks and plot- and land-parcel based vegetation surveys (Annexes 3.4a-c). These have been used in conjunction with community discussions to determine the restoration and sustainable land management practices for the project areas. The interventions include enhancing the tree cover and species richness of MPTS in agroforestry areas, propagating native forest/RTE species to make land parcel boundaries and shade trees and designating protected zones of good quality forest (Annex 1.3). Monitoring in natural regeneration zones will allow us to assess the potential for unassisted/assisted vegetation recovery.

Developing the ongoing monitoring design and Plan Vivo project idea notes (PINs) for the two areas will support quantification (stem density, species richness) of this outcome as the project progresses. Data will be captured using the mobile application that has been in design phase in Year 1 and 2. Early in year 3 we will review potential additional social forest areas but discussions with partners during March 2024 workshops indicate good likelihood of restoration projects being developed within 3 years after the end of this project. We plan to submit a logframe change request to update the target around tree cover and species richness enhancement.

Outcome Indicator 0.2

Baseline surveys of wellbeing were conducted in Year 1. During Year 2, project coordinators have continued to engage with communities in Bengkulu (Air Tenam) and Aceh (Lutueng, Blang Dalam, Turue Cut and Mane) to discuss community land management plans, restoration efforts and identification of priority project interventions for a future PES project.

A second iteration of a PIN was completed for Air Tenam and is with Plan Vivo for review. The PIN identifies key project interventions that are intended to deliver socio-economic benefits and that have been identified as priorities in discussions with representatives from the local community (including through focus group discussions with women and youth groups). This includes planting and maintenance of multi-purpose tree species (MPTS), as well as support for processing MPTS fruits and other products (a priority for women) and ecotourism (a priority for youth). A tree adoption scheme has also been implemented with the support of KKI Warsi, to generate additional income to support restoration efforts, and maintenance of MPTS trees has been supported through payments from Gojek GoGreen, facilitated by KKI Warsi.

In Aceh, there has been a strong focus on monitoring planted MPTS trees and RTE propagation over the last year, which will provide an important basis for restoration of the forest and the wider ecosystem services it provides. The PIN for Aceh is still under development, with additional support being provided to the Aceh team to support PIN development in February 2024.

A follow up assessment will be made in year 3 of the project, which will act as an endline survey of wellbeing. Beyond the lifetime of the project, socio-economic monitoring will be ongoing as part of the Plan Vivo certification and review process.

Outcome Indicator 0.3

Restoration activities in the two provinces typically follow 'ecosystem restoration or rehabilitation' as opposed to 'ecological restoration' (where some ecosystem functions are restored, but restoration does not have the goal of recovering the full natural forest plant community). Restoration through planting MPTS is more frequently applied as this brings the potential for economic benefits to communities, which can help support and incentivise forest protection, and because these seedlings

are more widely available. Including multiple MPTS species can also enhance socio-economic resilience (e.g. lower community reliance on one species) and ecological resilience (e.g. plant community resistance to pests and disease). Incorporating additional plant diversity into restoration requires engagement, capacity building around collection, nursery, propagation and maintenance and incentivisation (e.g. through viable biodiversity credits or stacking). There is a target for integrating planting of 20% RTE species into restoration in Aceh landscape; phenology monitoring of mother trees, collections of wildings and experimentation with propagating early successional pioneer species and collection of happen-stance fruits has initiated in Year 2 and will continue in Year 3 (Annex 2.1b & c). The forest management unit identified a threatened *Magnolia* species as an important species locally in Aceh – some 300 seedlings have been raised and planted. In the landscape in Bengkulu, the Warsi team conducted some extension work to support communities in coffee/MPTS productivity and reduce concerns/highlight potential benefits of shade trees in the landscape and we have increased variety of MPTS species which is supporting land-holders that are negatively affected by poor coffee productivity. The two community forest areas have planned natural regeneration areas to test how their inclusion may enhance landscape-level biodiversity outcomes and provide opportunities for biodiversity credit finance. We have recruited a PhD student to consider the role of forest connectivity for faunal biodiversity outcomes. Camera trapping was deployed in both project areas (Annex 3.5) and data analysis will commence in Year 3 – this will give a first assessment as to how forest quality is affecting animal movements within the landscapes and hopefully identify connectivity bottlenecks. Nonetheless, it may be challenging to observe improvements to functional connectivity within the project lifespan as any new tree cover will be small, rather than full canopies, meaning we may have to apply space-for-time substitution in our analyses. We plan to submit an updated logframe to better define the target biodiversity enhancement for this outcome.

Outcome Indicator 0.4

A key outcome for the project is the development of a viable model (see logframe for definition) for income generation from multi-objective restoration (Indicator 0.4). The baseline position at the start of the project is that no viable model existed.

Over the last year, there have been further clarifications from the Government of Indonesia on how projects can proceed to operate on the Voluntary Carbon Market (VCM). Efforts to ensure that the Plan Vivo Standard qualifies for 'mutual recognition' remain a priority. Mutual recognition refers to the recognition of Voluntary Carbon Standards as suitable frameworks and methodologies to implement community-based carbon projects and estimate climate benefits.

Plan Vivo is currently in the process of submitting its [Forestry and Agroforestry Methodology](#) for approval to the Sistem Registri Nasional (SRN) for endorsement, and continues to keep abreast of developments through Indonesia-based colleagues (including consultant Ellyn Damayanti and a contact at UNEP).

In parallel, efforts to develop alternative models through PES or Plan Vivo Nature are continuing. In January 2024, Plan Vivo successfully launched [Plan Vivo Nature](#) and several pilot projects are currently underway towards helping to bring these [high integrity](#) credits 'to market'. In addition, Plan Vivo is collaborating with resellers and projects to develop a PES mechanism that will enable projects to access finance to support them to deliver positive social and biodiversity outcomes, without having to generate discrete 'credits'. These efforts will help to provide alternatives in case there are challenges with carbon trading moving forwards.

PIN and PDD documentation, which are the project design documents underpinning the registration and certification of a Plan Vivo project towards enabling access to PES income, are in development at both Bengkulu and Aceh sites.

3.4 Monitoring of assumptions

We continue to monitor our assumptions through regular cross-partner meetings, where partners have contact with a range of stakeholders and knowledge sources.

Outcome level:

1. Indonesia remains committed to its stated goals on poverty alleviation, restoration, community-managed land and addressing climate change. *Comments:* This assumption holds true – we are not aware of any policy changes related to these goals, as communicated by in-country partners.
2. Ongoing support from key government institutions (Ministry of Environment and Forestry; Ministry of Land Use and Spatial Planning) for involving influential thinkers among their staff at national and local levels in our sequential workshop in spatial planning consultation processes. *Comments:* This assumption holds true. We continue to have support from government agencies through BRIN and provincial government level support through meetings held in September 2022.
3. There will not be any large-scale mortality events (e.g. severe drought, fire) which affect ecological restoration. *Comments:* There have been no such events affecting our project sites in year 2. The El Nino event later in 2023/24 does not seem to have adversely affected our focal sites. Challenges around planted tree mortality have occurred at one site as discussed under Progress. We will continue to monitor the situation and plan any restoration and maintenance activities bearing this in mind.

Output 1

1. Multiple stakeholders continue to see value in the process. *Comments:* The stakeholders continue to be engaged.
2. Agreement reached on multi-objectives and management. *Comments:* Partners have achieved good collaboration and agreement with local stakeholders and communities regarding local land management, demonstrating the assumption that agreements can be achieved holds.
3. Community forestry representatives and government extension workers available to attend training. *Comments:* This assumption holds – we have good engagement from local stakeholders, and project participants have attended training sessions coordinated in both landscapes. Extension to a broader number of participants in Aceh will be beneficial going forwards.

Output 2

1. Selected seedlings/restoration materials available. *Comments:* MPTS seedlings have already been provided by watershed and forest management units and some purchased. Developing nursery stocks of RTE and native species has been quite challenging, but we will continue to develop knowledge and practices to support this activity.
2. Activities are not interrupted by major natural hazards (e.g. El Niño drought). *Comments:* There have been no such events affecting our project sites. The El Nino event later in 2023/24 does not seem to have adversely affected our focal sites.

Output 3

1. Multiple stakeholders continue to see value in the process. *Comments:* This assumption holds – we have good engagement from local partners and stakeholders; we will expand our stakeholder group.
2. Community forest representatives and government extension workers available to attend training. *Comments:* This assumption holds – we have good engagement from local partners and stakeholders; training is still due to happen in year 3

Output 4

1. Multiple stakeholders continue to see value in the process, supported by the cost-benefit analysis. *Comments:* The CBA has been successfully completed, with input from relevant stakeholders. The project work has identified that initial financial reward for seedling maintenance can also support the field work and participation at the earliest project phases, whilst seedlings mature.
2. Co-benefits from nature-based PES certification schemes continue to command high market prices and demand for high quality PES credits (including from restoration in Indonesia) continues to grow. *Comments:* This assumption holds – there continues to be high demand in the market for

high quality PES credits. The government of Indonesia continues to support carbon trading framed by new legislation (as of November 2022).

3.5 Impact: achievement of positive impact on biodiversity and poverty reduction

Our proposed impact was *“Forest restoration in Indonesia achieves ‘the triple win’ of sustainable biodiversity conservation, carbon sequestration and enhanced livelihoods and governance outcomes”*.

Our project is showing good potential for some short-term impacts – local communities and stakeholders in the two landscapes have actively participated in restoration activities (planting, maintenance and monitoring and designating areas for natural regeneration and protection) that we hope will derive ecosystem services benefits, yield medium-term economic benefits through the multi-purpose and culturally-valued tree species planted. In-country partners are looking for opportunities to extend the model to other communities towards the end of the project to expand the impact, and our spatial prioritisation analysis will be shared with stakeholders later in the project to help identify the most strategic opportunities for restoration in Sumatra and Indonesia more broadly (Output 1). Later in the project, through the involvement of Liam Hughes (PhD student at DICE Kent, co-supervised at UKCEH) we plan to improve an understanding of habitat quality on faunal biodiversity and look at opportunities to incorporate habitat connectivity into spatial planning so that restoration positively impacts faunal species, involving stakeholder input. Both case-study sites are on the periphery of large forest areas, and so crude measures of connectivity based on forest extent will not be informative.

During development of the project, in-country partners described two challenges - i) resource intensive processes for forest monitoring and data processing and ii) poor data capture on the fate of seedlings distributed to community members. We hope that our co-produced monitoring app will alleviate some of these pressures, making it easier for individuals and organisations to motivate and track progress, leading to more positive restoration outcomes. Our community training in Year 3 will help to ascertain whether using an app motivates smallholders to track trees planted in agroforestry areas, and engagement with other stakeholders will reveal whether it will be adopted in other project areas. Our monitoring will enable us to understand potential carbon and biodiversity benefits of the project actions. This has value from the perspective of optimising management, as well as understanding the potential income from the nature capital market. These benefits may take some time to realise, both in the project areas and across other sites in Indonesia (e.g. low biomass gain at small tree sizes; slow rates of population change; time to on-board new communities). Restoration priorities for local communities have focussed on multi-purpose tree species, but each project area has components of natural regeneration and propagation of rare and threatened tree species. We hope that through engagement with stakeholders, we can expand the contribution of greater diversity and threatened species in restoration planning and explore opportunities for incentivising the time effort and risk involved.

Our market analysis has also enabled us to understand the potential for community restoration projects to benefit from the emergent market in biodiversity certificates as well as interest in less formal PES markets. The analysis indicates that the market places high value on robust monitoring, cost transparency and social impact. This project therefore contributes valuable learning for community projects in Indonesia and beyond.

The advances that our project is making will facilitate the scaling up of community-led tropical forest restoration in several ways: 1) our vision is that our two project sites will form positive demonstration sites for successful community-led restoration (Output 2 and 3). 2) Development of the restoration standard methodology will create a route for communities to access benefits from restoration action, including (assisted) natural regeneration. 3) Assessing PES and biodiversity credit options may identify alternative income generation models and support communities to have a greater focus on biodiversity in restoration planning (Output 4). 4) Capacity building (e.g. land use analyses, spatial planning and restoration monitoring tools (Output 1; Output 3) will support strategic decision-making and more efficient MRV for forest restoration.

4. Project support to the Conventions, Treaties or Agreements

We have not had any interaction with host country convention focal points in the last 12 months but in the coming year we will seek opportunities to do so. Two members of the project team are members of the UN Decade on Restoration Task Force for Restoration Best Practice and two members of the UN Decade on Restoration Task Force for Restoration Monitoring, presenting an opportunity for the lessons learned from the project to be disseminated more widely.

Our project contributes to the following national policies and international conventions, treaties and agreements:

IBSAP/ CBD Aichi Targets No. 2 by providing spatial planning & prioritisation tools to integrate biodiversity values to local development plans (see Output 1);

IBSAP/ Aichi No. 14 by restoring degraded ecosystems to improve essential ecosystem services. Aichi target No. 12 on efforts to maintain and restore habitat of the critically endangered species (such as the Sumatran elephant, *Elephas maximus sumatranus*, also listed in CITES Appendix 1) (see Output 2 on restoration action); SDGs 13 and 15, by restoring degraded ecosystems through tree planting activities and assisted natural regeneration in project sites – and mitigating climate change threats and impacts. The project will also build resilience within communities to climate change in the long term (see Output 2). This project also contributes to the National Action Plan for Climate Change Adaptation in Indonesia (RAN-API, 2014) by increasing local community capacity in reducing climate risk through the rehabilitation of degraded ecosystems, using agroforestry.

IBSAP No. 21 by providing restoration tool for assessing, monitoring, and mapping biodiversity and restoration impact in target areas (see Output 3 on restoration monitoring);

SDGs 1, 5 and 8, by enabling access to direct and indirect income from PES and planted trees, equitable benefit sharing and community-led development opportunities (including seasonal and permanent employment) for project communities. The project will have an inclusive approach, and ensure safeguarding of marginalised groups, women, and children and of traditional knowledge and rights in all project activities. (see Output 4, working towards Plan Vivo certification and income generation).

Members of the project team from F&F are planning to attend the next COP in Colombia, 2024, to engage the community on biodiversity credits, bringing biodiversity into restoration and showcasing our project.

5. Project support for multidimensional poverty reduction

The expected beneficiaries of the project are members of households in the villages of Air Tenam (Bengkulu province) and Mane, Blang Dalam and Lutueng (Aceh province). In the short-term our project will contribute to strengthening community governance of natural resources, building local skills and capacity in tree nurseries and restoration, and generating income from multi-purpose tree species.

Both teams have continued to engage with local communities in the project area towards supporting and expanding restoration efforts and land management planning towards developing the PIN. Key achievements this year in terms of supporting poverty reduction, are the planting and survival of multi-purpose tree species, capacity building for successful restoration and development of a tree adoption scheme (in the short term) drafting of the Air Tenam PIN (in the medium-term), and restoration efforts including with RTE species in collaboration with local communities (in the longer term).

Specifically, the Warsi team (Bengkulu landscape) have continued their engagement work with the local community to identify customary land parcel ownership and usage, drivers for shifting cultivation, and defining boundaries of the 'protection zones' considered to be particularly pressing now following the development of a new road through the social forest area. They also continue to work to involve different groups within the community, including women and youth, towards building broader ownership and ensuring wider benefits across the community. In Aceh, planning for new restoration areas in Lutueng, Blang Dalam and Mane village forest areas involving at least 20 new

local landholders has been ongoing , with further consultations with landholders and Provincial Watershed Management planned for Year 3.

In Aceh and Bengkulu, the local community continue to be involved in tree cultivation (nursery), restoration (planting) and monitoring activities (e.g. Annex 0.3, 2.1-2.2, 3.4). Seedlings were provided by the Watershed Management Agency or purchased, and for a small proportion of trees, locally propagated and have been planted, with guidance and support of project staff across both project landscapes. These achievements are documented and evidenced in section 3 (outputs 1 and 2 above). In Aceh, training in tree maintenance and pest control was provided for 22 participants (representing local landowners and government representatives) in September 2023, training in tree monitoring was provided for 10 people in November 2023. The project also supported nursery materials (nets, poly bags) and the community provides the labour.

In Bengkulu there is a strong emphasis on MPTS species that will provide tangible income generating opportunities. This has also encouraged involvement of more residents from Air Tenam – with a further 33 residents (a total of 60 people) receiving seedlings and therefore having the opportunity to directly benefit from and become involved with the restoration programme. The distribution of seedlings was agreed upon by the community through participatory discussions involving the heads of HKM and HTR, the Village Government, and local stakeholders. In addition, at the Bengkulu site, villagers have been generating income from a tree adoption scheme and coordinated by the Warsi team. This initial financial incentivisation seems to have yielded excellent commitment from the villagers in monitoring and maintaining newly planted stems with on average 96% survival (Annex 0.3).

The Air Tenam draft PIN has been developed to its second iteration (version) and reviewed by Plan Vivo and considered near to completion. The PIN sets out the proposed management system that would allow the Air Tenam community to benefit from Plan Vivo carbon credits in future. The Aceh PIN is approximately 60% complete. Plan Vivo project development requires detailing of benefit sharing mechanisms, which is an important aspect as project areas reach credit issuing stage and projects can start to derive economic benefits. Local capacity building will be important if project areas plan to incorporate biodiversity monitoring in their project proposals to access income from biodiversity credits, and this project will act as a pilot for highlighting opportunities and barriers to accessing finance through biodiversity credits - community members from Air Tenam received training in camera trap installation to support wildlife monitoring.

In the longer term, our project aims to strengthen benefits derived from improved ecosystem services (carbon sequestration biodiversity, soil and water regulation), through restoration efforts (tree planting and natural regeneration) and enabling communities to access PES finance to support long-term management of natural resources and community development. In Aceh, there has been a strong focus on RTE planting over the last year, which will provide an important basis for restoration of the forest and the wider ecosystem services it provides. In the first year, progress towards accessing PES certification has been achieved by working with communities to undertake baseline studies of ecological and socio-economic conditions. In addition, progress was made on developing a restoration methodology to support PES linked to restoration efforts and the restoration monitoring app aimed at reducing costs of restoration monitoring by communities under the PES scheme.

6. Gender Equality and Social Inclusion (GESI)

Please quantify the proportion of women on the Project Board ¹ .	50% of the Project Board are women (Lindsay Banin, UKCEH; Emmy Primadonna, KKI Warsi, Kristin Olsen & Eva Schoof, Plan Vivo) and 50% are men (Matt Struebig, University of Kent, Sugeng Budiharta, BRIN, Joseph Hutabarat, FFI, Keith Bohannon, Plan Vivo).
Please quantify the proportion of project partners that are led by women, or which have a senior leadership team consisting of at least 50% women ² .	To our knowledge, none of the partner organisations are led by women. At the Plan Vivo Foundation both the senior leadership team and Board of Trustees are >50% women.

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.	X Both project partners seek to enable participation of women in project design and capacity building opportunities within the cultural constraints. KKI Warsi has sought to mainstream gender into their PIN and have a dedicated team member working to ensure inclusion of youth and women.
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	
Transformative	The project has all the characteristics of an 'empowering' approach whilst also addressing unequal power relationships and seeking institutional and societal change	

Last year we reported that within the project landscapes, typically, women and men have different roles in terms of their use and involvement in the forest and its management. Both projects have sought to involve women in project meetings and enable them to access capacity building opportunities. For example, in Aceh, ten youths (including 4 women) were trained in tree measurement and data sheet completion in Turue Cut village in November 2023. Two discussions with landowners around FPIC, planting, tree maintenance and pest control included the single female landowner (of 16) or representatives of her family (when she was unavailable). During meetings with community representatives and Plan Vivo/ TLLG in

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

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

February 2024, only 14% participants were women; whilst this is lower than our target of 50%, we believe the project is going beyond the documented cultural norms for this province where men and women have typically very distinct areas of participation. The team at F&F staff have undertaken gender-related training and continues to consider how best equal opportunities for participation can be delivered. Gender equality forms part of the Environmental and Social Screening during PIN development, and part of the Environmental and Social Impact Assessment during the PDD development. During her visit in February 2024, Ellyn Damayanti discussed with the team on how to consider gender equality in the PIN/ PDD in development.

KKI Warsi have continued to build on its year 1 gender analysis towards considering how to address gender challenges through the project. In May 2023, Plan Vivo (Eva Schoof and Kristin Olsen) provided an online training session for three KKI Warsi members including the project Manager Emmy Primadonna, on gender mainstreaming. The training considered how the team could build on their understanding of gender challenges and ‘desirable changes’ (which emerged through the gender analysis) towards setting objectives that could be achieved through the project. As a result, further discussions were held with community representatives (June 2023), and the draft project PIN has clear objectives for inclusion of women and youth groups, described as “the future generation responsible for safeguarding the forest”. Specifically, both women and youth groups are identified as key stakeholders whom the project aims to benefit through building capacity in processing of multi-purpose tree species and ecotourism, respectively. Ensuring that these groups are represented in the process represents a significant change in the way that community engagement in terms of forest resources takes place in the community. The PIN also identifies current challenges for women and youth in having their voices heard and involvement in forest governance and are keen to support greater inclusion through enabling their participation in the project. The team also includes a Gender and Youth Specialist dedicated to addressing gender and youth-related aspects within the project.

7. Monitoring and evaluation

M&E focus and responsibility: Monitoring, evaluation and learning effort has been focussed on poverty and wellbeing, biodiversity and restoration, and project implementation. As far as possible, the project has focussed on drawing on MEL expertise of partners, whilst also strengthening capacity where needed (e.g. Participatory Wellbeing Assessments, Land Cover Mapping and GIS, Tree Survival Monitoring, Vegetation baseline survey and sampling design, PIN and PDD development and Camera Trapping), and aligning project monitoring efforts with wider requirements of the certification process. M&E is the responsibility of all project partners, with PVF as lead partner.

Activity and output tracking and reporting: Project delivery is guided by project design (outlined in the Darwin application) as well as the logframe. Project partners are responsible for tracking and reporting on the activities for which they hold responsibility (as outlined in the governance structure). A project M&E plan was developed to support partners in understanding what should be measured as they carry out activities, as well as responsibilities for monitoring. A project OneDrive has been established to enable projects to upload reports and other forms of ‘evidence’ that activities have been carried out and records of meetings held – all members of the project team have access to this shared space. Planning, reporting and discussion of activities takes place during monthly team meetings. This has been extended with an M&E Tracker which clearly outlines the evidence needed for each indicator and activity – based on Year 2 activities and outputs, and assigned responsible partners, which was developed by the M&E manager to support greater level of coordination amongst project partners and provided a useful tool in our face-to-face meeting for collating evidence.

Capacity building: During February and March 2024, projects received further support in PIN development from the TLLG/ Plan Vivo team in Aceh (with the support of Ellyn Damayanti) and in Bengkulu (with the support of Harry Tittensor). Discussions on conducting follow up Participatory Wellbeing Assessments in Year 3 were also held.

Outcome tracking: Baseline monitoring activities were described in Year 1. The team undertook additional baselining activities to support ongoing assessment of outcomes, namely a survey of the

existent vegetation in rehabilitation zones in Bengkulu and natural regeneration zones in Aceh. This is described in detail in section 3.3.

Changes to the logical framework: Several changes were made to the logframe following discussions with project partners, and to better reflect the outcome level changes that were being tracked. A revised version of the logframe is due to be submitted.

Opportunities and Challenges: Our monthly meetings have continued to provide an important mechanism for tracking progress between partners, with partners often sharing progress and updates via powerpoint presentations. Similarly, our annual team meetings and field trips in Indonesia have provided an important opportunity to provide capacity building as well as build an understanding of progress – as well as gaps and challenges. During this year (February/ March 2024) it was not possible for the (foreign) project team to visit one of our field sites (Aceh) due to political sensitivities. Our colleague, Ellyn Damayanti, was therefore able to visit and spend 3 days with the project team, including visiting some of the participating communities and project sites. This helped to highlight some important areas of progress (e.g. in terms of PIN development), but also highlighted some challenges (e.g. in terms of local capacity) because some of the activities required for this stage in the project are complex and new to the team. As a result of this visit, we have been able to follow up with the F&F team to implement measures to help support the local team further.

8. Lessons learnt

The opportunity to meet in person for the two international visits has been really valuable for developing the project together and tackling any challenges; it also offers the time and space to overcome any language barriers and clarify meaning. The project team have been able to gain a much better understanding of the sites and the local contexts and communities around the restoration activities from the visits, and develop trust with the communities and stakeholders. In particular, gathering the two Indonesian teams together has been really important for cross-fertilisation of ideas and sharing strengths within the project. The F&F team have a long history of monitoring biodiversity, particular animal diversity through camera trapping whereas this aspect is relatively new to the Warsi team; conversely, the Warsi team are particularly strong on social engagement and inclusion practices. The Warsi team have been inspired by the use of native and RTE species by the F&F team and want to delve more deeply into this opportunity, and partners at BRIN have additional knowledge to bring to this aspect of the work. The F&F team have been spurred on by the Warsi team progress on the Plan Vivo PIN. The project team will continue to seek opportunities to share learning between organisations and with other relevant NGOs focussed on restoration in Indonesia. In sum, the knowledge exchange amongst partners has been really beneficial and facilitated by longer discussions during face-to-face meetings. Similarly, collaborative working on the PIN development (Output 4) and sharing ideas for methods, monitoring and determining impact has been really useful. Rapid progress was made during face-to-face workshops in Indonesia, March 2024.

In our last annual report we highlighted that a key lesson was arriving at a common understanding of 'restoration'. Indeed, we have realised that targets and indicators look quite different for MPTS planted areas compared with recovery of native forest vegetation and it makes sense to adjust logframe indicators to separate out the rehabilitation and restoration approaches, with appropriate targets for each.

An important finding has been the spatial variation in seedling survival, and we are still working within the adaptive management process to fully understand the environmental and social factors driving the variation. Two landowners have achieved particularly good survival rates in the Aceh site. Immediate financial incentives and the involvement of an agricultural specialist has had really positive outcomes for rehabilitation success at the Bengkulu site. The potential role of immediate financial incentive (even for MPTS species which have their own mid-term economic value) is important because this may indicate challenges around participation in ANR and native forest species propagation. We have also identified particular challenges around sourcing seed and propagating native forest species and building this knowledge base is an important, ongoing activity – these activities are constrained by time available for the communities to participate in the activities, especially monitoring phenology.

We continue to think carefully about appropriate methods for equality and social inclusion in the Aceh community meetings whilst being sensitive to cultural norms – understanding this context has

been really important for the project team as a whole. Similarly, the GESI requirements of the Darwin grant have stimulated important considerations. The project team should carefully monitor attendance to meetings, especially those which result in important decision-making.

A number of uncertainties still exist around voluntary carbon markets and biodiversity credit markets in Indonesia, and therefore the project areas are having to make methodology decisions when processes for credit issuance and income generation are still somewhat uncertain. It has been really valuable to connect to appropriate stakeholders to keep a clear understanding of the status and ensure that the Plan Vivo methodologies are viewed and critically assessed.

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

We thank our reviewer for their thorough assessment and useful feedback. We were delighted with the positive feedback in our report and the recognition and encouragement from our reviewer that this is an important, timely and complex project. We were also really pleased that they asserted that evidence to date suggested we were broadly on track to deliver, scoring “2 - likely to largely deliver”. Here, we respond to the specific comments and queries from Section 2 of the review:

Comment 1 (no response needed) The reviewer recommends the reforestation paper – Ten Golden Rules [...] (Di Sacco et al, 2021). [...] It discusses ‘livelihood native forest’ and agroforestry on existing agricultural land; for the restoration of areas of natural forest, it advocates accelerated natural regeneration where possible, but also other approaches such as the ‘framework species method’ where appropriate, and the importance of selecting appropriate species to maximise biodiversity.

Whilst no response was requested here, we would like to respond that this paper is very applicable to the project and the different objectives of the different forest types/interventions are useful for guiding reformulation of logframe indicators and separating out indicators most relevant to different types of restoration.

Comment 2 (response at next annual report) Local communities and stakeholders were reported to have prioritised planting of multi-purpose trees, but the project plans to include 20% rare and threatened tree species at Aceh. It is not clear how these trees will be selected; whether their potential to enhance biodiversity will be considered? and how much time the project will need to study fruiting phenology, develop propagation protocols for these species, and trial their survival following transplantation.

A key feature of the review was around the nature of the plant species composition in the restoration areas. Since the fundamentals were established during year 1, with an emphasis on the species selected by the local communities as required by a community-led process, we have put significant effort into this component in year 2. In the Aceh landscape, there has been a greater focus on this activity because it was embedded in earlier discussions that there ought to be a target of 20% RTE species. As outlined under Section 3.1, activities have included - 1) locating and monitoring mother trees, 2) creating a seedling nursery, 3) collecting and growing wildlings and 4) testing propagation of multiple species from seed. We have identified a continued need to develop knowledge around local plant species assemblages and their environmental niches, phenology and reproductive traits of locally important species, and the appropriate collection and nursery management of pioneer and late successional species. In our discussions amongst the project team and with local collaborators and stakeholders, there is a need to collate this disparate knowledge. We are also seeking to link with another Darwin project specifically focussing on seed supply systems in SE Asia so we can exchange knowledge between the teams. The Warsi team working in Bengkulu have been inspired by these opportunities and are keen to explore engaging with the community in year 3 of the project.

Comment 3 (response at next annual report) The project highlights a small number of multi-purpose species including several non-native species. Is there potential to include more high value native forest species in these plantings in addition to the rare threatened and endangered species, to provide NTFPs and also enhance biodiversity?

As per above and in Section 3.1, we have been working to expand the range of native forest species by making use of local surveys of the vegetation and focusing on culturally important species. In Year 3 we will continue the engagement further to expand the list and appropriate methods to generate successful native tree regeneration. In the Bengkulu landscape, once we have identified that native tree planting is desired by the community, we will use vegetation survey work and ethnobotanical study to identify potential native forest species for planting. It has been of particular interest to community participants to use native forest species as boundary markers or

fences, which provides a nice opportunity to incorporate more functionally diverse trees into the landscape. Similarly, extension work, it may be possible to use native species to enhance riparian corridors. An important factor will be to incentivise the labour and commitment required to deliver these longer-term ecosystem benefits.

Comment 4 (response at next annual report) The project highlights 'gaps in methodologies' related to assisted natural regeneration and indicates a new restoration approved methodology could fill this gap. Has the project considered the existing and proven framework species approach to species selection for planting in such areas (Goosem and Tucker, 2013 Repairing the Rainforest; Di Sacco et al., 2021) to complement and promote natural regeneration?

We are still gathering evidence at these sites regarding the requirements for assisted natural regeneration in dedicated native forest/protected zones. The plot-based monitoring of naturally regenerating areas will help to identify whether there is a lack of opportunity for natural regeneration due to seed supply or seed survival (e.g. competition from weeds, grasses and vines). There may also be a need for trial-and-error of appropriate methods at the two sites, but incentivisation of the labour involved will be important, as per the native forest species planting. Our understanding of the framework species method is that a cohort of functionally diverse saplings are planted simultaneously to speed up the successional process. We are still establishing a suite of appropriate species and knowledge around their phenology and nursery management, so conducting this approach in one step may be ambitious, but we will bear it in mind. We had planned to initiate some native pioneer planting first in some areas so that by the time a seedling supply of late-successionals had been developed, the conditions may be primed for good survival.

Within the body of the review, the reviewer asked what action the project had taken as a result of gender studies. We continue to emphasise practices that give equal voices across groups, whilst respecting cultural norms and divisions of labour, and articulated distinct areas of interest, and aim to create opportunities for participation. From Section 6: "Specifically, both women and youth groups are identified as key stakeholders whom the project aims to benefit through building capacity in processing of multi-purpose tree species and ecotourism, respectively. Ensuring that these groups are represented in the process represents a significant change in the way that community engagement in terms of forest resources takes place in the community."

The reviewer also commented that some annexes were not available – as there were a lot, we had put a note in the report that we had only made a selection from each Output available as attachments to the report and to email to request access to additional annexes and this must have been missed. Apologies for confusion this caused.

10. Risk Management

A notable new risk has been the clearing for a new road through the Air Tenam (Bengkulu) social forestry area which connects Air Tenam village to neighbouring villages and beyond to the main city in the subdistrict, Manna. Air Tenam villagers and FMU are concerned that this will significantly affect access to the surrounding land, potentially with new people entering the forest area, clearing and claiming customary land access. In response this, project partner Warsi and local villagers with support from the FMU are intending to rapidly erect notices informing of the forest protection zones which have gained approval. Village patrols will alert any new clearance activity. With these mitigation measures in place, it is hoped this will act as a deterrent to any encroachment. The landcover map exercise serves as a baseline and can be repeated to demonstrate any changes. It is anticipated that previously cleared but now regenerating areas and secondary forest areas may be most at risk; new agroforestry plantings are less likely to be at risk.

A known risk in restoration projects is the continued participation of community representatives and landowners. In the Aceh site, the survival of seedlings was highly variable spatially, which may have arisen from a mix of ecological and social factors. We recognise that it is imperative that local participants drive the land-use decision making and are incentivised for the maintenance and monitoring in the medium to long term. In Bengkulu, the maintenance of the planted saplings has been supported and encouraged through additional payments. There have also been issues with seedling quality (low survival rates). These are common problems associated with restoration projects but warrant further investigation and forward planning.

Seed source supply of native species and seed quality are potential risks for raising the biodiversity value of the restored areas. The project team will continue to develop and elaborate

protocols for planning for the restoration zones, seed sourcing (also an activity related to planting RTE species), nursery methods, monitoring and maintenance, drawing on growing collaborative links in the region. We continue to work on our practices for cross-partner communications and data sharing which are fundamental to the success of the project, especially when working in distributed international teams.

10. Sustainability and legacy

Stakeholder meetings held with provincial government and forest management unit representatives indicated that the goals of the project are well-aligned to the challenges they are trying to address, with opportunities for future coordination around best practice and monitoring tools. Partner and provincial government engagement in the spatial planning and prioritisation activities indicates that tools (Output 1 and 3) may be applied to additional project areas in the future (see Outcome Indicator 0.1). As the project outputs develop, we plan to host workshops with state-level government representatives, as supported by our project partner BRIN. Meetings held with BRIN (National Research and Innovation Agency, Indonesia) in September 2022 and University research partners in March 2024 revealed that the project is well-aligned to the interests in their ecology divisions, demonstrating good opportunity for ongoing collaboration on forest restoration in Indonesia beyond the lifetime of the project.

Partner engagement in land-use mapping activities is an opportunity to build capacity within in-country partner organisations, to apply to other project areas and allow scaling up of activities. We have used open-source software and reproducible workflows for mapping and prioritisation analyses so they can easily be applied in the future. The mobile application will be open-source so that it can be accessed by other projects.

Positive community response around diversification of MPTS and possible ecosystem benefits of tree planting and forest restoration indicate that forest restoration activities should be sustainable, particularly if survival rates can be maintained and landowners/holders can realise direct economic benefits and improvement in land management practices. This will also help to secure forest protection zones and allow areas for natural recovery to occur, which will hopefully have longer-term positive biodiversity outcomes. Training and extension work in year 2 of the project has supported local capacity building, and will also be an opportunity for knowledge exchange and incorporating local knowledge in restoration activities and decision-making. In the final year of the project, we plan to expand activities around native forest species planting and gain a deeper understanding of how that can be supported as a sustainable activity.

Project partners are identifying new communities and restoration areas to support the scaling up of activities and enhancing opportunity for landscape connectivity. Positive outcomes from this project will garner support in new project areas and help to ensure that the social forestry approach in Indonesia has positive outcomes for people and biodiversity.

Underpinning activities around carbon/PES markets and restoration standards and development of certified Plan Vivo projects will help to ensure additional economic benefits can be accessed. Working closely with stakeholders such as the UNDP and British Embassy and their contacts will help information exchange and a foundation for PES access.

11. Darwin Initiative identity

A project webpage is hosted on the UKCEH website, which acknowledges Darwin funding support including the approved Darwin Initiative logo (<https://www.ceh.ac.uk/our-science/projects/forest-restoration-indonesia>). The webpage can be updated with selected outputs generated throughout the project. We plan to initiate a Twitter and/or Instagram account linked to the project and the TR3 app in Year 3, linking back to BCF.

The project team delivered Powerpoint presentations in Indonesia (February/March 2024) to provincial stakeholders, university collaborators and the British Embassy (see Section 2), in which the BCF funding was acknowledged and logos used. In-country partners also provided banners for stakeholder workshops.

Matt Struebig and Dominic Muenzel (University of Kent) and Beth Raine (UKCEH) presented oral and poster presentations at the British Ecological Society Symposium hosted at University of Kent, June 2023 on distinct Darwin project outcomes where the funding source was acknowledged (see details in list below).

Project PI (Lindsay Banin) incorporated the Darwin project as a case study within a Defra funded scoping study on monitoring biodiversity in low-middle income countries – Darwin funding was acknowledged with use of logos in two presentations and as a section with the written report. Lindsay has also presented the project (with Darwin acknowledge and logos used) at an external workshop and University seminars (see list below), and has been invited to deliver a seminar as part of IPB's .and has been invited to deliver a seminar as part of IPB's Summer School. She is currently exploring the opportunity to provide a Case Study report for the GCBC evidence-gathering exercise for nexus (climate-biodiversity-poverty alleviation) studies.

Presentations and publications

Raine EH, Purnama H, Primadona E, Yusuf F, Berry N, Olsen K, Struebig M, Banin LF. High spatio-temporal resolution land cover mapping for community-led forest management in Sumatra. Poster presented at: *Trees for Climate Change, Biodiversity and People: British Ecological Society Conference; 28th June 2023; University of Kent*

Struebig, MJ, Muenzel, D, Banin, LF, Budiharta S, Hutabarat J, Morgans C, Mumbunan S, Primadona E, Purnama H, Raine EH, Santika T, Voigt M, Winarni N, Supriatna J, Davies Z, Smith S. Delivering on conservation, restoration and poverty alleviation goals in Indonesia's community forests. Talk presented at: *Trees for Climate Change, Biodiversity and People: British Ecological Society Conference; 29th June 2023; University of Kent*

Morag McCracken, Stephen Cavers, *Lindsay Banin*, Diana Bowler, Alex Bush, Helen Coskeran, France Gerard, Quentin Groom, Pete Henrys, Jane Hill, Maria Jarquin, Colin MacKechnie. Michael Pocock, Dan Read, Jill Thompson, Stephen Thackeray, Kelly Widdicks, Emily Williams, Helen Roy. Mapping and Monitoring Biodiversity, Part I: Scoping Exercise. Report to Defra, March 2024.

Lindsay F Banin, Strengthening community capacity for evidence-based forest restoration in Indonesia: Valuing Biodiversity in Restoration. Presentation at Mapping & Monitoring Biodiversity, Defra Scoping Study Workshop, Lancaster, March 2023.

Lindsay F Banin, Forest Restoration in SE Asia for biodiversity, climate and people: Lessons learned and future directions. 13th Chinese-German Workshop on Biodiversity and Ecosystem Services and 2nd Workshop for Young Researchers, Wuzhishan City, Hainan Province (online delivery), 7 November 2023.

Lindsay F Banin, Forest Restoration in SE Asia for biodiversity, climate and people: Lessons learned and future directions. IPB University, March 2024

Lindsay F Banin, Forest Restoration in SE Asia for biodiversity, climate and people: Lessons learned and future directions. University of Stirling Seminar Series, April 2024

12. Safeguarding

Has your Safeguarding Policy been updated in the past 12 months?	Yes/No
Have any concerns been reported in the past 12 months	No
Does your project have a Safeguarding focal point?	Yes [REDACTED] level; Emmy Primadona and Dedi Kiswayadi for project site-level
Has the focal point attended any formal training in the last 12 months?	Yes/No [If yes, please provide date and details of training] LB attended UKCEH- providing training in May 2023 for all staff members.
What proportion (and number) of project staff have received formal training on Safeguarding?	Past: 18% [3] Planned: 50% [9]
Has there been any lessons learnt or challenges on Safeguarding in the past 12 months? Please ensure no sensitive data is included within responses.	No
Does the project have any developments or activities planned around Safeguarding in the coming 12 months? If so please specify.	<p>Environmental and social safeguards policies aim to ensure that participants' human rights are respected and that any risks of non-intended negative impacts of projects are managed and addressed. Robust environmental and social risk management leads to better and more sustainable projects and avoids projects harming people or nature. Due to the nature of the Plan Vivo Standard, which focuses on participatory approaches to project development and equitable benefit-sharing, Plan Vivo projects already incorporate many aspects of environmental and social (E&S) safeguarding. As part of the recent update of the Plan Vivo Standard (v5.0), new requirements in Plan Vivo Standard v5.0 and the implementation of new environmental and social risk management procedures ensure that all Plan Vivo projects are aligned with international best practice.</p> <p>To demonstrate ongoing commitments to identifying, monitoring and reporting environmental and social (E&S) risks, projects are required to complete key environmental and social safeguards activities to be completed during project development and implementation:</p> <ul style="list-style-type: none"> • Pre-screening of environmental and social risks (PIN stage) • E&S screening, assessed by the Plan Vivo Foundation's E&S reviewers (PIN stage) • Depending on the risk level of the project, E&S assessment scoping and planning (PDD stage) • Depending on the risk level of the project, an E&S assessment in the field (PDD stage) • Development of an E&S management plan (ESMP) (PDD stage) • Development of an E&S monitoring plan (PDD stage) • Validation of E&S assessment & ESMP (Validation) • Annual E&S monitoring and reporting (Annual Reporting) • Verification of E&S monitoring and reporting (Verification) • Final evaluation of ESMP implementation at the end of the project (Verification) <p>Following the submission of the Air Tenam PIN, Plan Vivo will undertake a safeguarding assessment in May 2024.</p>
Please describe any community sensitisation that has taken place over the past 12 months; include topics covered and number of participants.	None
Have there been any concerns around Health, Safety and Security of your project over the past year? If yes, please outline how this was resolved.	No

13. Project expenditure

Table 1: Project expenditure during the reporting period (1 April 2023 – 31 March 2024)

Project spend (indicative) since last Annual Report	2023/24 Grant (£)	2023/24 Total Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)				Largely attributable to a UKCEH staff under-booking of time (due to staff change and an absence) and slight delay to activities under Output 3
Consultancy costs				
Overhead Costs				
Travel and subsistence				Underspend in T&S due to being unable to visit Aceh site/co-funding to UKCEH staff. Some costs offset by slight increase in operating costs (T&S for local staff)
Operating Costs				
Capital items (see below)				
Others (see below)				Underspend on consumables budget line.
TOTAL	£197, 323.	£189,535.6		

Overall, we had an underspend of £7788.26 across the project for Year 2. A large proportion of this was from an underclaim of £4346.44 in staff costs primarily from UKCEH staff costs, and the remainder being underspend in T&S and other costs. We would be really pleased if we could explore with Darwin for these funds to be transferred to assist Year 3 delivery.

Table 2: Project mobilised or matched funding during the reporting period (1 April 2023 – 31 March 2024)

	Secured to date	Expected by end of project	Sources
Matched funding leveraged by the partners to deliver the project (£)	██████████ In year 23-24	██████████	Institutional funding to UKCEH for overheads; NERC NC International for flight; funding from Leverhulme to DICE-Kent team; ARIES DTP for PhD studentship; in-kind staff time from Plan Vivo and BRIN

Total additional finance mobilised for new activities occurring outside of the project, building on evidence, best practices and the project (£)			
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11. Other comments on progress not covered elsewhere

12. OPTIONAL: Outstanding achievements or progress of your project so far (300-400 words maximum). This section may be used for publicity purposes.

I agree for the Biodiversity Challenge Funds 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).

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

Annex 1: Report of progress and achievements against logframe for Financial Year 2023-2024

Project summary	Progress and Achievements April 2023 - March 2024	Actions required/planned for next period
<p>Impact</p> <p>Forest restoration in Indonesia achieves 'the triple win' of sustainable biodiversity conservation, carbon sequestration and enhanced livelihoods and governance outcomes</p>	<p>The project work has continued to work with local communities and authorities to support forest restoration and protection activities which are intended to bring ecosystem service, economic and biodiversity benefits to community forest areas. Underpinning activities (creating a restoration standard and efficient monitoring systems and strategic planning methodologies) are contributing to a future where restoration can generate well-being and economic benefits to local communities. A draft PIN has been prepared for Air Tenam, and is in progress for Aceh, which will provide a basis for applying for Plan Vivo certification and enabling communities to access payments for ecosystem services in the longer term. The project contains two case study landscapes which are establishing protocols and methods for rigorous restoration practices. By extending a network of practitioners and restoration scientists, we are building scalable solutions and facilitating knowledge exchange.</p>	
<p>Outcome</p> <p>High-quality and sustainable ecosystem restoration is delivered on social forestry and degraded forest land in Aceh Province and Bengkulu Province delivering climate, biodiversity and socio-economic co-benefits</p>		
<p>Outcome indicator 0.1: 130 hectares of land have received sustainable land management practices (ICF KPI 17) and tree cover (stem density, species richness) is enhanced across at least 2 community forest areas (at least 500 ha) in Sumatra as a result of multi-objective restoration activities by end of project, with a remaining 4 community forests on track to deliver within 3 years.</p>	<p>Sustainable land management practices have been undertaken in Lutueng village forest (Aceh) and Air Tenam village, totalling in the order of c.40ha (see Annex 0.3; Annex 1.4; Annex 3.4). Additional areas have been designated as protection zones in Air Tenam (Annex 1.3) and additional areas have been identified in Aceh but require further community participant onboarding.</p>	<p>1) Continued engagement with land-owners/land-users within the two social forestry areas to extend scale of activities within the landscapes; 2) endline monitoring for spatial interventions and tree cover/composition; 3) reporting on engagement with new community forest areas</p>
<p>Outcome indicator 0.2: Smallholders and forest-dwelling communities (8624 people) in at least 2 community forest areas receive increased socio-economic benefits from multi-objective restoration and access to community-based restoration payment</p>	<p>A second iteration of a PIN was completed for Air Tenam and is with Plan Vivo for review. The PIN identifies key interventions that will deliver socio-economic benefits that have been identified as priorities in discussion with the local community. This includes planting and maintenance of</p>	<p>Endline wellbeing assessment will be carried out in Year 3 of the project.</p>

<p>for ecosystem services (PES) by end of project, with a remaining 4 community forests on track to deliver within 3 years.</p>	<p>MPTS, as well as support for processing (a priority for women) and ecotourism (a priority for youth). A tree adoption scheme has also been implemented to generate income to support restoration. The PIN for Aceh is still under development, with additional support being provided to the Aceh team to support PIN development in February 2024.</p>	
<p>Outcome indicator 0.3 Biodiversity (tree species richness and functional diversity) and habitat connectivity with extant forest areas increased across at least 500 hectares as a result of multi-objective restoration activities by end of project.</p>	<p>The range of MPTS species planted has increased. The project has made progress in incorporating native forest species into nurseries and plantings in Aceh - 300 Meudang Puteh trees were transplanted to restoration sites; a further 70 seedlings (mixed RTE species) were collected to be nurtured in the nursery prior to transplanting (Annexes 2.1b & c). Baseline monitoring of natural regeneration zones has been undertaken to understand the potential barriers to biodiversity protection and recovery.</p> <p>Baseline assessment of faunal diversity has been initiated this year - camera trap survey was initiated January-September 2023 at the Bengkulu site (Annex 3.5). Biodiversity monitoring at the Aceh site commenced in March/April 2024.</p>	<p>Baseline monitoring of native forest vegetation in protected zones in Bengkulu landscape.</p>
<p>Outcome indicator 0.4 Viable model for income generation from multi-objective restoration, developed in collaboration with stakeholders, and piloted in Aceh Province and Bengkulu Province. (Value of ecosystem services generated or protected – aligned with ICF KPI 10).</p>	<p>Baseline condition is that no viable model for income generation exists. PIN and PDD is in development at both Bengkulu and Aceh to enable access to PES income.</p>	<p>Indonesian partners will develop and submit their PIN and progress their PDD application for certification. Cross-partner discussions will generate understanding around choices on preferred income generation pathways. Plan Vivo will work to ensure that the Plan Vivo Standard qualifies for mutual recognition by the Government of Indonesia.</p>
<p>Output 1 Restoration planning: Co-produced spatial prioritisation and community land management & intervention plans for two project areas and improved local capability for delivering restoration with multiple objectives</p>		
<p>Output indicator 1.1</p> <p>1.1 Two province-level participatory stakeholder workshops held where engagement with participants resulted in defining restoration objectives and identification of data needs for spatial prioritisation (yr1)</p>	<p>Completed (Year 1)</p>	

<p>Output indicator 1.2, 1.2 Spatial prioritisation framework developed, databases collated and priority areas for restoration identified on community and government land in Bengkulu and Aceh Provinces (yr1)</p>	<p>Completed (Year 1)</p>	
<p>1.3 Community consent achieved through at least four participatory community workshops and focus group discussions to identify restoration objectives, representing the view of women, men, cultural and age groups and where at least 30% of the participants are women (yr1)</p>	<p>There has been continued engagement with communities in Bengkulu and Aceh, to identify priority areas and species for restoration (including RTE and MPTS) species (Annexes 2.1a,b,c). Efforts have been made to extend benefits and involve more communities at both sites. In Bengkulu, priorities of women and youth have been integrated into project design through specific interventions. In Aceh, the project continues to promote participation of women, with 40% women involved in monitoring activities (although <30% in other meetings as landholders are predominantly men).</p>	
<p>1.4 Community land management plan objectives reflect socio-economic, biodiversity and long-term restoration benefits and prioritise interventions at the project-site scale and including at least 20% RTE (rare, threatened, endangered) species (yr 1)</p>	<p>The Warsi team (Bengkulu landscape) have continued their engagement work with the local community to identify customary land parcel ownership and usage, drivers for shifting cultivation, and setting 'protection zones'. Discussions on the protection zones have been supported by remote sensing analyses on forest condition (Annex 1.3). The draft PIN (Annex 4.5) details the project interventions and objectives linked to forest protection and restoration (including planting, maintenance, monitoring and patrols), as well as supporting socio-economic benefits through processing MPTS products (a priority for women), ecotourism (a priority for youth) and tree adoption – with the aim of bringing PES benefits. In Aceh, local scale restoration planning required checking through drone survey, ground-based spot checks (Annex 1.4a) and discussions with the local communities to understand current land-use, to inform decisions as to appropriate interventions. The F&F team are also working with local stakeholders in an effort to extend the proposed restoration area.</p>	<p>Engagement with community in Bengkulu around aspirations for planting of native forest/RTE species. Link community land management plans to Plan Vivo PIN/PDD documents.</p>
<p>1.5 At least 50 community and government representatives attend two-day training workshop in restoration management (25 in year 1, 25 in year 2)</p>	<p>In Aceh, 22 people attended a training workshop on tree planting and maintenance and pest control including landowners and representatives from village and mukim government. The training included practical sessions on tree</p>	<p>Ascertain and deliver on any ongoing training needs for restoration maintenance and agricultural techniques/species selection.</p>

	maintenance such as clearing grass around trees, applying fertilizer, and checking for pests and diseases (Annex 1.5).	
Output 2. Restoration action: two project areas with seedlings planted, protected and/or maintained		
Output indicator 2.1. 2.1 At least two nurseries established to process c. 10,000 seedlings with at least 20% RTE species (the remainder are multipurpose tree species) (yr1-2)	A total of 31,929 seedling have been planted: 22,100 from 4 nurseries at Lutueng, Blang Dalam, Mane and Turue Cut (Aceh) with 67% survival rate (Annex 2.1a; 3.4a) and 9,829 seedlings from Bengkulu nursery (see Year 1 report) with 96% survival rate (Annex 0.3). Planted trees to date are MPTS. Efforts are ongoing to incorporate RTE and native species of value into restoration plantings at Aceh. 300 Meudang Puteh trees were transplanted to restoration sites; a further 70 seedlings (mixed RTE species) were collected to be nurtured in the nursery prior to transplanting (Annexes 2.1b & c).	Future planting locations will be determined after discussions with land users to ensure their commitment to tree maintenance, and we will explore adaptations to management and maintenance practices to support higher survival rates. Next year surviving RTE species will be transplanted, more pioneer tree fruits will be collected and propagated and opportunities for ANR explored.
Output indicator 2.2. 2.2 At least 250 ha planted, weeded and protected in two case study areas (yr2-3). More than 1400 ha allocated to ongoing and future restoration activities (yr3)	To date 63.2ha land have been planted and maintained in the project area: 30.2ha in Bengkulu and 33ha in Aceh (Year 1 report).	In year 3 restoration efforts will be extended to include ANR and explore opportunities for incorporation of more native forest trees into the agroforestry areas.
Output 3. Restoration monitoring: mobile-based application enabling robust and efficient monitoring of restoration objectives, developed for use in community-managed forests		
3.1 One multi-stakeholder needs assessment to inform design of restoration monitoring tool (yr1)	Completed (Year 1).	
3.2 Restoration monitoring tool developed in collaboration with stakeholders through two codesign workshops (yr1-2)	Year 2 has focussed on strengthening the app's data capture functionality and production of relevant exports and data summaries (mock-up presented as Annex in Year 1 report), including producing relevant species lists, implementation of a mobile app backend database and operational backend infrastructure, development of a mobile app framework that supports offline use, and established a continuous integrated pipeline.	Beta version of the app will be finalised and trialled by project partners and affiliated stakeholders. After final iterations the app should be available for release to the app store and deployed.

<p>3.3 Training of at least 50 community forest monitoring team members provided where at least 30% of the participants are women (yr2)</p>	<p>In Aceh the F&F team conducted training with local community members to support them in planting, monitoring and maintaining planted seedlings in September 2023 (6 Annex 1.5; 3.3). A further 10 youths (40% women) received training in on tree measurement and data sheet completion in November 2023.</p> <p>Online training for the camera trap data analysis was conducted in September 2023, delivered by the University of Kent team and attended by 5 of the KKI Warsi staff.</p>	<p>Community training in use of the monitoring app will take place during the Year 3 project visit.</p>
<p>3.4 Baseline assessment (yr1-2), and annual monitoring and replacement re-planting conducted (yr3).</p>	<p>Monitoring of planted seedlings has continued at both the Aceh and Bengkulu sites. At the Bengkulu site, the team have focussed on the monitoring of 9829 durian, jengkol and pinang seedlings across 31 farmer land-parcels and have identified generally good survival of the planted species (96%) (Annex 0.3) and have been working with an agricultural specialist to identify causes of plant ill-health and mortality and support local land-users in achieving good outcomes and where possible enhance survival. In Aceh, the team has undertaken training with the local community to plant, maintain and monitor their planted seedlings; monitoring commenced in September 2023, with 67% survival rate. The first data collection period of animal biodiversity monitoring with camera traps has been undertaken at the Bengkulu site (Annex 3.5). Biodiversity monitoring at the Aceh site commenced in March/April 2024.</p>	<p>Endline monitoring of planted trees and plot-surveys to determine project impacts to vegetation structure and composition and to help identify bottlenecks in natural recovery in protected/degraded zones.</p>
<p>Output 4. Restoration income generation: Model to incentivise communities through income generation from restoration is developed and available to community-managed forest PES projects</p>		
<p>4.1 Cost-benefit analysis of community managed restoration (considering benefits from restoration planting over time, payments for ecosystem services (PES) models, and optimisation of ecosystem restoration) demonstrates short, medium and long-term income from restoration at two community forestry sites in Aceh and Bengkulu Provinces (yr 1)</p>	<p>Completed (Year 1).</p>	
<p>4.2 Market analysis of multiple PES for restoration options in Indonesia undertaken and provides options for design of PES model (yr1)</p>	<p>Completed (Year 1).</p>	

4.3 One stakeholder consultation (involving Indonesian and Plan Vivo global stakeholders) to inform design of adapted Plan Vivo 'restoration' Standard (yr1)	Completed (Year 1).	
4.4 Adapted Plan Vivo 'restoration' Standard to secure payments for ecosystem services from demonstrated restoration impact drafted and quality assured (yr2)	As per Plan Vivo procedures, a concept note for the revised restoration module was submitted to the Plan Vivo secretariat and Technical Advisory Committee and reviewed by the Plan Vivo Technical Review Panel in Q4 of 2023. A Working Group meeting was held in Jan 2024 to discuss a revised version of PU001 to address issues raised related to estimating woody biomass. The Working Group has provided feedback, and the final changes are currently being incorporated into a final version which will be submitted to Plan Vivo for review and approval by mid-May 2024. (Annexes 4.4a & b)	Complete Restoration Methodology and release for use.
4.5 Access to PES extended to at least 250 small holders and/ or forest-dwelling community members in Aceh and Bengkulu Provinces with at least 2,500 planned beneficiaries from equitable benefit sharing mechanism (yr 3)	KKI Warsi has submitted a second iteration of their PIN for Air Tenam on behalf of the community. The PIN has received some requests for further amendments but is near to being approved. If successful, the project will benefit 50 households (180 people). The PIN for Aceh is in development. (Annex 4.5)	Finalise PIN for Bengkulu and Aceh and progress the next step in the process – development of a PDD

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

Project Summary	SMART Indicators	Means of Verification	Important Assumptions
Impact: Forest restoration in Indonesia achieves ‘the triple win’ of sustainable biodiversity conservation, carbon sequestration and enhanced livelihoods and governance outcomes. (Max 30 words)			
Outcome: (Max 30 words) High-quality and sustainable ecosystem restoration is delivered on social forestry and degraded forest land in Aceh Province and Bengkulu Province delivering climate, biodiversity and socio-economic co-benefits	0.1 130 hectares of land have received sustainable land management practices (ICF KPI 17) and tree cover (stem density, species richness) is enhanced ^[1] across at least 2 community forest areas (at least 500 ha) in Sumatra as a result of multi-objective restoration activities by end of project, with a remaining 4 community forests on track to deliver within 3 years.	0.1 Land-use change assessment; baseline and annual monitoring of vegetation recovery	Indonesia remains committed to its stated goals on poverty alleviation, restoration, community-managed land and addressing climate change. Ongoing support from key government institutions (Ministry of Environment and Forestry; Ministry of Land Use and Spatial Planning) for involving influential thinkers among their staff at national and local levels in our sequential workshop in spatial planning consultation processes. There will not be any large-scale mortality events (e.g. severe drought, fire) which affect ecological restoration
	0.2 Smallholders and forest-dwelling communities (8624 people) in at least 2 community forest areas receive increased socio-economic benefits ^[2] from multi-objective restoration and access to community-based restoration payment for ecosystem services (PES) by end of project, with a remaining 4 community forests on track to deliver within 3 years.	0.2 Baseline and end-of-project surveys of socio-economic benefits, including context-specific wellbeing and resilience indicators (disaggregated by gender). Indicators and success criteria will be developed in collaboration with community partners.	
	0.3 Biodiversity (tree species richness and functional diversity) and habitat connectivity with extant forest areas increased across at least 500 hectares as a result of multi-objective restoration activities by end of project.	0.3 Baseline and annual restoration monitoring reports, including biodiversity assessments; forest connectivity assessed through land-use maps.	
	0.4 Viable model ^[3] for income generation from multi-objective restoration, developed in collaboration with stakeholders, and piloted in Aceh Province and Bengkulu Province.	0.4 Plan Vivo Restoration (PES) Standard, enabling PES income for community managed restoration, is produced and piloted within	

	(Value of ecosystem services generated or protected – aligned with ICF KPI 10).	Indonesia. Cost benefit analysis and market analysis.	
Outputs: 1. Restoration planning: Coproduced spatial prioritisation and community land management & intervention plans for two project areas and improved local capability for delivering restoration with multiple objectives	1.1 Two province-level participatory stakeholder workshops held where engagement with participants resulted in defining restoration objectives and identification of data needs for spatial prioritisation (yr1)	1.1 Stakeholder workshop proceedings (Q2, yr 1)	Multiple stakeholders continue to see value in the process Agreement reached on multi-objectives and management
	1.2 Spatial prioritisation framework developed, databases collated and priority areas for restoration identified on community and government land in Bengkulu and Aceh Provinces (yr1)	1.2 Maps of priority areas for restoration activities; scientific publication of spatial modelling (Q2, yr 1)	Community forestry representatives and government extension workers available to attend training
	1.3 Community consent achieved through at least four participatory community workshops and focus group discussions to identify restoration objectives, representing the view of women, men, cultural and age groups and where at least 30% of the participants are women (yr1)	1.3 Community workshop proceedings and statement of intent (FPIC), with participants list disaggregated by gender and cultural groups (Q3, yr 1)	
	1.4 Community land management plan objectives reflect socio-economic, biodiversity and long-term restoration benefits and prioritise interventions at the project-site scale and including at least 20% RTE (rare, threatened, endangered) species (yr 1)	1.4 Community and government management plans, reflecting needs of women and men, for two restoration implementation landscapes (Q4, yr 1)	
	1.5 At least 50 community and government representatives attend two-day training workshop in restoration management (25 in year 1, 25 in year 2)	1.5 Training attendance and attendee feedback, disaggregated by gender (Q2, yr 2)	
2. Restoration action: two project areas with seedlings planted, protected and/or maintained	2.1 At least two nurseries established to process c. 500010,000 seedlings with at least 20% RTE species (the remainder are multipurpose tree species) (yr1-2)	2.1 Project activity reports (including nursery photographs; reports on seedling provision/ wildling collection) (Q2, yr 2)	Selected seedlings/restoration materials available.

	2.2 At least 250 ha planted, weeded and protected in two case study areas (yr2-3). More than 1400 ha allocated to ongoing and future restoration activities (yr3)	2.2 Project area maps; land management plans; bi-annual mobile app monitoring records to document planted trees (Q3, yr3)	Activities are not interrupted by major natural hazards (e.g. El Niño drought)
3. Restoration monitoring: mobile-based application enabling robust and efficient monitoring of restoration objectives, developed for use in community-managed forests	3.1 One multi-stakeholder needs assessment to inform design of restoration monitoring tool (yr1)	3.1 Restoration monitoring needs assessment report (Q2, yr 1)	Multiple stakeholders continue to see value in the process
	3.2 Restoration monitoring tool developed in collaboration with stakeholders through two codesign workshops (yr1-2)	3.2 Co-design workshop proceedings (Q4, yr1) and delivery of open-source monitoring tool (Q1, yr 3)	Community forest representatives and government extension workers available to attend training
	3.3 Training of at least 50 community forest monitoring team members provided where at least 30% of the participants are women (yr2)	3.3 Training attendance and assessment disaggregated by gender (Q2, yr 2)	
	3.4 Baseline assessment (yr1-2), and annual monitoring and replacement re-planting conducted (yr3).	3.4 Monitoring reports to show changes in vegetation structure relative to baseline (Q2 yr 2; Q3 yr 3)	
4. Restoration income generation: Model to incentivise communities through income generation from restoration is developed and available to community-managed forest PES projects	4.1 Cost-benefit analysis of community managed restoration (considering benefits from restoration planting over time, payments for ecosystem services (PES) models, and optimisation of ecosystem restoration) demonstrates short, medium and long-term income from restoration at two community forestry sites in Aceh and Bengkulu Provinces (yr 1)	4.1 Cost-benefit analysis report for community managed restoration, including gender analysis (Q3, yr 1)	Multiple stakeholders continue to see value in the process, supported by the cost-benefit analysis Co-benefits from nature-based PES certification schemes continue to command high market prices and demand for high quality PES credits (including from restoration in Indonesia) continues to grow.
	4.2 Market analysis of multiple PES for restoration options in Indonesia undertaken and provides options for design of PES model (yr1)	4.2 Market analysis report and recommendations for PES model (Q3, yr 1)	
	4.3 One stakeholder consultation (involving Indonesian and Plan Vivo global stakeholders) to inform design of adapted Plan Vivo 'restoration' Standard (yr1)	4.3 Stakeholder consultation records and design document (Q4, yr 1)	

	4.4 Adapted Plan Vivo 'restoration' Standard to secure payments for ecosystem services from demonstrated restoration impact drafted and quality assured (yr2)	4.4 Draft Plan Vivo 'restoration' Standard peer and reviewed and approved by the Plan Vivo Technical Committee (Q4, yr 2).	
	4.5 Access to PES extended to at least 250 small holders and/ or forest-dwelling community members in Aceh and Bengkulu Provinces with at least 2,500 planned beneficiaries from equitable benefit sharing mechanism (yr 3)	4.5 Project Idea Note (PIN) submitted (Q1, yr3) and draft Project Design Documents (PDDs) detailing beneficiaries and co-developed equitable benefit sharing mechanism prepared (Q4, yr3) for at least two community forests in Aceh and Bengkulu Provinces.	

Activities (each activity is numbered according to the output that it will contribute towards, for example 1.1, 1.2 and 1.3 are contributing to Output 1)

Output 1: Restoration planning

Activity 1.1: Workshops and stakeholder engagement to define restoration objectives and data needs for spatial prioritisation (yr1). Workshops will be held in each of the two provinces to maximise stakeholder engagement.

Activity 1.2: Collation of appropriate datasets, produce a spatial prioritisation workflow and conduct multi-objective spatial prioritisation analysis to assess synergies and trad-offs

Activity 1.3/4: Focus Group Discussions and village meetings to confirm community consent and to develop community land management plan applying the 'intervention continuum approach' and guiding principles for supporting diversity, as well as local and traditional knowledges, including at least 20% RTE (rare, threatened, endangered) species (yr 1-2)

Activity 1.5: Training workshops to ensure sustained capacity in restoration activity management within two case study landscapes.

Output 2: Restoration action

Activity 2.1: Constructing two tree nurseries in the targeted villages (yr2)

Activity 2.2: Tree planting, weeding, protection and maintenance including re-planting to replace lost stems (yr 2)

Output 3: Restoration monitoring

Activity 3.1: Conduct a user needs assessment and review of existing tools, involving the project partnership team, consultants and relevant stakeholders, in alignment with Activities 1.4 (land management plan), 4.3 and 4.4 (development of the restoration standard)

Activity 3.2: Hold co-design workshops with relevant stakeholders and community representatives to develop app features in detail (yr1-2). App development undertaken in collaboration with consultant, Flumens Ltd.

Activity 3.3: Undertake training to build capacity with community membership to understand and use the forest monitoring tool and supply feedback to make improvements to the tool (yr2)

Activity 3.4: Baseline assessment, including survey of naturally regenerating seedlings and mother trees to support recovery of native species and diversity within project areas, and annual monitoring conducted in years 2 and 3.

Output 4: Restoration income generation

Activity 4.1: Cost benefit analysis, including diverse restoration income sources from restoration activities and PES markets, to inform design of PES model in Indonesia

Activity 4.2: Market analysis, in Indonesia and globally, to inform design of PES model

Activity 4.3: Stakeholder consultation to inform design and quality assurance of the Restoration Standard.

^[1] Tree cover (as quantified by mutually agreed vegetation metrics) is greater than baseline.

^[2] Socio-economic benefits will be increased relative to baseline (indicators and success criteria will be agreed with community partners). Key benefits will include economic (income and employment), socio-political (knowledge and skills gained, as well as increased voice, agency and inclusion), and ecological (restoration and sustainable use of natural resources).

^[3] A viable model is one that (a) ensures that income from PES and multi-objective restoration covers project operational costs and delivers tangible livelihood benefits, and (b) is commercially viable. This will be measured through the cost benefit analysis and market analysis.

Annex 3: Standard Indicators

Table 1 Project Standard Indicators

DI Indicator number	Name of indicator using original wording	Name of Indicator after adjusting wording to align with DI Standard Indicators	Units	Disaggregation	Year 1 Total	Year 2 Total	Year 3 Total	Total to date	Total planned during the project
DI-A03	Number of local/ national organisations with improved capability and capacity as a result of project.	Number of local organisations with improved capability and capacity as a result of project.	Number of organisations	Community forest management organisations	4	4		4	4
DI-A03	Number of local/ national organisations with improved capability and capacity as a result of project.	Number of national organisations with improved capability and capacity as a result of project.	Number of organisations	Conservation NGOs	2	2		2	2
DI-A04	Number of people reporting that they are applying new capabilities (skills and knowledge) 6 (or more) months after training.	Number of local people in project villages applying new capabilities in nursery management and restoration 6 (or more) months after training.	People	Women/Men Local people	0	0		0	25/25
DI-A04	Number of people reporting that they are applying new capabilities (skills and knowledge) 6 (or more) months after training.	Number of people applying new capabilities in wildlife monitoring 6 (or more) months after training.	People	Women/Men Project staff	0	0		0	5/5
DI-B03	Number of new/ improved community management plans available and endorsed [by a third party]	Number of new/ improved community management plans available and endorsed by an independent certification body	Number	Bahasa & English PDD/ Certification application	0	0		0	2
DI-B07	Number of people participating in community-based management groups and/ or Payment for Ecosystem Service schemes.	Number of people participating in community-based Payment for Ecosystem Service schemes.	People	Women/Men (direct beneficiaries) Age group	0	0		0	795
DI-C04	New assessments of community use of biodiversity resources published.	New assessments of community use of biodiversity resources published in community management plan.	Number	Participatory resource use assessment	0	2			4

DI-C12	Social media presence	Social media presence on Twitter platform	Number	Followers	0	0			250
DI-D01	Hectares of habitat under sustainable management practices	Hectares of community forest under sustainable management practices	Hectares	Community forest area	0	33		0	130
DI-D08	Value of ecosystem services generated or protected as a result of project support [ICF KPI 10]	Value of ecosystem services generated or protected as a result of project support [ICF KPI 10]	GBP Sterling		0	0		0	TBD (a reliable estimate can be made once a community management plan is in place)
DI-D12	Area of degraded or converted ecosystems that are under active restoration	Area of degraded or converted ecosystems that are under active restoration	Area (hectares)	Active restoration typology	TBD				500
DI-D16	Number of households reporting improved livelihoods.	Number of households reporting improved wellbeing.	Households	% levels of moderate wellbeing across 4 villages as assessed through Participatory wellbeing assessment	14-38%	No new data		14-38%	≥14-38%

Table 2 Publications

Title	Type (e.g. journals, best practice manual, blog post, online videos, podcasts, CDs)	Detail (authors, year)	Gender of Lead Author	Nationality of Lead Author	Publishers (name, city)	Available from (e.g. weblink or publisher if not available online)
Mapping and Monitoring Biodiversity, Part I: Scoping Exercise	Report	Morag McCracken, Stephen Cavers, <i>Lindsay Banin</i> , Diana Bowler, Alex Bush, Helen Coskeran, France Gerard, Quentin Groom, Pete Henrys, Jane Hill, Maria Jarquin, Colin MacKechnie. Michael Pocock, Dan Read, Jill Thompson, Stephen Thackeray, Kelly Widdicks, Emily Williams, Helen Roy. (2024)	F	UK	Defra	Defra
Forest Restoration in Indonesia	Webpage	L Banin (2023)	Woman	UK		https://www.ceh.ac.uk/our-science/projects/forest-restoration-indonesia

Annex 4: Onwards – supplementary material (optional but encouraged as evidence of project achievement)

Table of Selected Annexes (numbers are aligned with Output numbers 1-4 and Activity numbers)

Annex 0.1 - Agenda for stakeholder meeting in Bengkulu, March 2024

Annex 0.2 - Minutes from F&F/British Embassy/UKCEH meeting in Jakarta, March 2024

Annex 0.3 - March 2024 summary report from KKI Warsi team at Monthly Meeting

Annex 1.2 - Spatial prioritisation presentation

Annex 1.3 - Landcover mapping in Bengkulu poster

Annex 1.4a - Ground-check report for restoration sites in Aceh

Annex 1.5 - Tree planting and maintenance training in Aceh

Annex 2.1a - Nursery report, Aceh

Annex 2.1b - RTE species collection and propagation report, Aceh

Annex 2.1c - RTE species collection and propagation datasheet, Aceh

Annex 3.3 - Training report – tree monitoring, Aceh

Annex 3.4a - Monitoring of planted trees report, Aceh

Annex 3.4b - Baseline data for (non-project-planted) trees in land parcels, Bengkulu

Annex 3.4c - Baseline plot-based data in natural regeneration zones, Lutueng, Aceh

Annex 3.5 - Camera trap survey preliminary report

Annex 4.4a - Restoration Methodology Feedback

Annex 4.4b - Draft Plan Vivo Restoration Methodology

Annex 4.5a - Plan Vivo training on PV Nature/PV Climate methodologies

Annex 4.5b - Project Idea Note (PIN) from KKI Warsi for Air Tenam

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?	Y
Is the report less than 10MB? If so, please email to BCF-Reports@niras.com putting the project number in the Subject line.	Y
Is your report more than 10MB? If so, please discuss with BCF-Reports@niras.com about the best way to deliver the report, putting the project number in the Subject line.	Selected annexes emailed, rest available on request
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.	Y
If you are submitting photos for publicity purposes, do these meet the outlined requirements (see Section 16)?	NA
Have you involved your partners in preparation of the report and named the main contributors	Y
Have you completed the Project Expenditure table fully?	Y
Do not include claim forms or other communications with this report.	