Darwin Initiative Main Annual Report

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

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

Submission Deadline: 30th April 2022

Darwin Initiative Project Information

Project reference	27-015
Project title	Farms and Forests: Boosting biodiversity and livelihoods in Northern Cambodia
Country/ies	Cambodia
Lead partner	Botanic Gardens Conservation International (BGCI)
Project partner(s)	Cambodia: National Authority of Preah Vihear (NAPV); Sra-aem Commune Council (Choam Ksant District) Viet Nam: International Center for Research in Agroforestry (ICRAF) (World Agroforestry)
Darwin grant value	£ 265,650
Start/end dates of project	October 1st, 2020 / March 31st, 2023
Reporting period (e.g. Apr 2021 – Mar 2022) and number (e.g. Annual Report 1, 2, 3)	Apr 2021 – Mar 2022 Annual Report 2
Project Leader name	Joachim Gratzfeld
Project website/blog/social media	BGCI website: https://www.bgci.org/our-work/projects-and-case-studies/farms-and-forests/ NAPV facebook and website: https://m.facebook.com/preahvihearauthority/posts/1407485462976918?locale2=en_GB https://napv.gov.kh/ ICRAF website: https://worldagroforestry.org/project/farms-and-forests-boosting-biodiversity-and-livelihoods-northern-cambodia
Report author(s) and date	BGCI: Joachim Gratzfeld, Greetha Arumugam and Nicole Lee NAPV: Eang Hourt Khou ICRAF: Nguyen Quang Tan, Rachmat Mulia, Aulia Perdana, Pham Thanh Van and Pham Duc Thanh April 30th, 2022

1. Project summary

The Preah Vihear Heritage Site (PVHS), Preah Vihear Province, northern Cambodia, is located in the Indo-Burma biodiversity hotspot and is an area of exceptional natural and cultural significance. PVHS includes deciduous and semi-evergreen dry forest unique to northern Cambodia, hosting more than 400 native plant species. It is also the location of the ancient Preah Vihear temple which, together with its surrounding landscape, was inscribed on UNESCO's World Heritage List in 2008. PVHS comprises multiple use zones including core conservation areas and community development land supporting over 3,000 households in seven villages (Figure 1). At present, PVHS covers a total area of 48,018 hectares, and is organised into four management zones: Zone 1 (Property zone, surrounding the Preah Vihear temple), Zone 2 (Buffer zone or Conservation zone), Zones 3a and 3b (Community development zone including Eco-Village and part of Sra-aem Khang Cheung village), and Zone 4 (Community development zone including 6 villages of Stung Khiev Techo, Chambak Senchey, Bangkol Prambei, Sra-aem Khang Cheung, Sen Chey and Techo Bos Sbov). Zones 3a and 3b and Zone 4 denote areas for socio-economic development activities, with only small isolated patches of natural forest remaining along streams. Zone 1 and Zone 2 denote areas for strict protection of the temple and other archaeological relicts, and conservation and management of natural landscapes, covering an area of 154 ha and 24,282 ha respectively and making up nearly 51% of the entire PVHS.

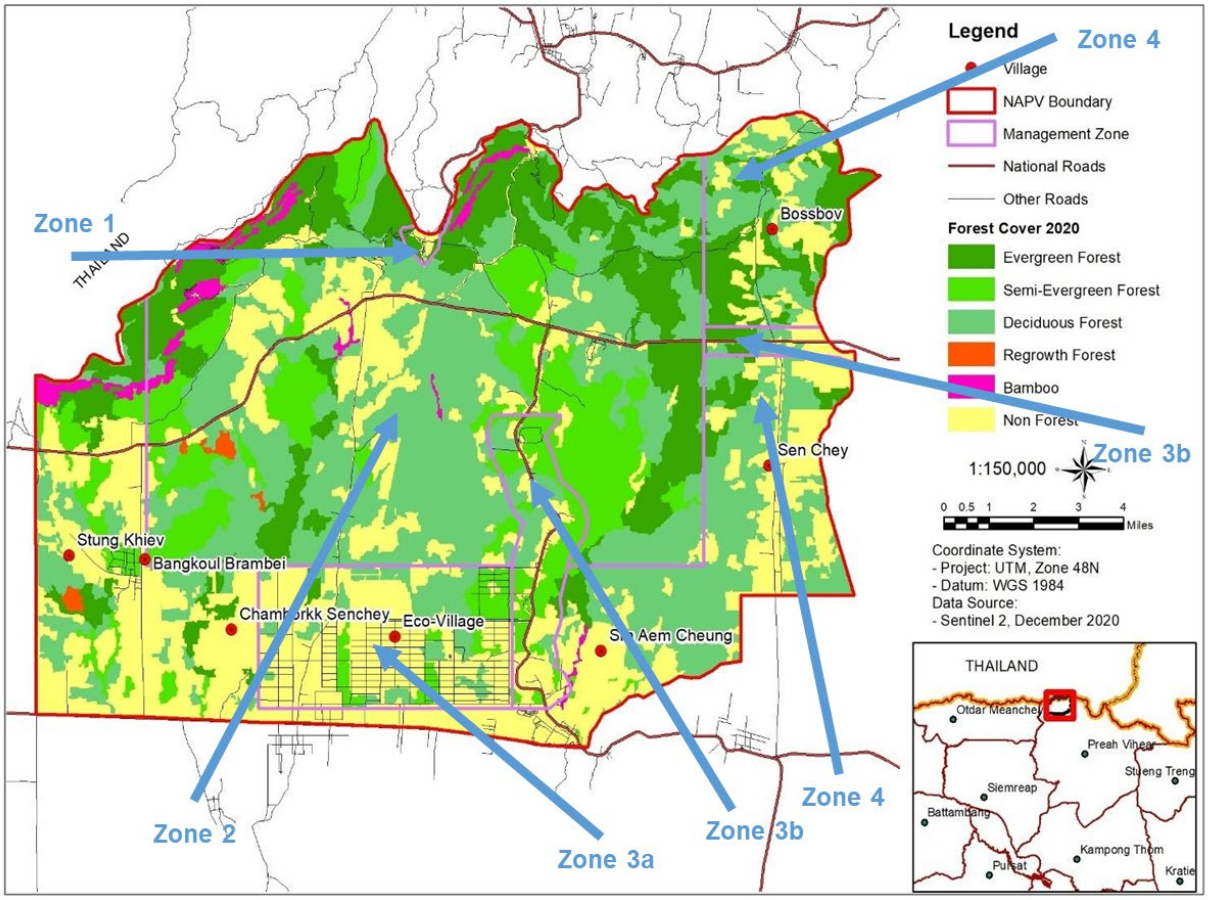


Figure 1: Preah Vihear Heritage Site (PVHS) in Choam Ksant district of Preah Vihear province showing the land use zones (blue arrows) and the four project target villages Techo Bos Sbov, Sen Chey, Sra Aem Khang Cheung and Thomacheat Samdech Techo Hun Sen (Eco-Village)

Forest fragmentation has intensified over the last decade due to increasing population and agricultural expansion. Communities rely on farming of few crop species, and the collection of wild forest resources in Zone 2. The use of fire to gain access to the forest threatens native plant species and overall biodiversity in PVHS. As climate patterns change and extreme weather events occur more frequently in the region, poor crop output, resultant higher reliance on wild collected species and clearance of the forest exert mounting pressure on native biodiversity. Various socio-economically valuable trees presenting keystone species of the dry forest habitat are threatened including rare legumes and rosewoods, such as *Afzelia xylocarpa* (Endangered), *Dalbergia*

cochinchinensis (Vulnerable), *Dalbergia oliveri* (Endangered) *and Pterocarpus macrocarpus* (Endangered) as well as the dipterocarps *Dipterocarpus alatus* (Vulnerable)*, Dipterocarpus intricatus* (Endangered), *Shorea roxburghii* (Vulnerable), *Anisoptera costata* (Endangered) and *Hopea ferrea* (Endangered). In addition, all species belonging to *Dalbergia* spp. are subject to trade regulations under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) to which Cambodia is a Party.

Key reasons for the intensifying drivers of change leading to food insecurity and biodiversity loss were identified in consultations with representatives from the Sra-aem commune in Choam Ksant district, in collaboration with the National Authority for Preah Vihear (NAPV) and the International Center for Research in Agroforestry (ICRAF) and Botanic Gardens Conservation International (BGCI) during the Darwin Partnership Project (DARPP199) in 2019 preceding this project: 1) lack of awareness about which native plant species can be domesticated and cultivated in home gardens and on farmlands; 2) limited technical capacity in horticulture, soil, and water management to augment food production; 3) poor business skills and knowledge of markets, value chains and high value products; 4) lack of knowledge and incentives for managing the forest sustainably.

This project addresses the issues of food security and its impact on biodiversity for four selected communities (Figure 1) in the Sra-aem Commune (villages of Techo Bos Sbov, Sen Chey, Sra Aem Khang Cheung and Thomacheat Samdech Techo Hun Sen (or Eco-Village)), through training in, and diversification of home garden and agroforestry farming practices. In parallel, mechanisms for linking forest recovery and care with employment opportunities are identified and developed, which are expected to generate new income and contribute to better protection of the forest in the long-term by reducing reliance on wild forest resources and unsustainable exploitation practices thereof.

2. Project stakeholders / partners

Botanic Gardens Conservation International (BGCI) and conservation partners in Cambodia and Vietnam have a longstanding joint working relationship – one of the earliest dating back to 2009 when a community-based conservation project on the Critically Endangered *Aquilaria crassna* incense tree was initiated in Bokor National Park, southern Cambodia (https://www.speciesconservation.org/case-studies-projects/oud-agarwood-eaglewood-krassana-gaharu/394) with funding provided by the Mohamed bin Zayed Species Conservation Fund. Over the years, this collaborative association with conservation partners in these countries has been consolidated through the Southeast Asia Botanic Gardens Network facilitated by BGCI (https://www.facebook.com/SEABGNetwork/) as a means to provide a platform for information exchange, learning and best-practice in the field of conservation of the region's native plant diversity. As articulated in Cambodia's National Biodiversity Strategy and Action Plan (2016) (https://ncsd.moe.gov.kh/dbd/biodiversity-policies-and-plans), the country has identified in Themes 9 and 13 on Sustainable forestry and Sustainable agriculture respectively, priority areas of intervention to address the concern over the human impact on forest health and natural processes of forest growth and regeneration, and to promote measures to increase agricultural productivity and efficiency, while avoiding further conversion of forest habitat to agriculture. Against this backdrop and pressing need for support, this project was jointly developed by the project partners in the Preah Vihear Heritage Site (PVHS) in northern Cambodia – the National Authority for Preah Vihear (NAPV) and the Sra-aem commune in Preah Vihear province, the International Center for Research in Agroforestry (ICRAF) in Vietnam and Indonesia, and BGCI in the United Kingdom. The technical consultations made under the Darwin Partnership Project *Building capacity for plant conservation in Preah Vihear*, *Cambodia* (https://www.darwininitiative.org.uk/project/DARPP199/) did not only assist in identifying the key challenges and needs to address growing food insecurity and loss of forest biodiversity in PVHS, but had been immensely valuable in consolidating the partnership in the lead up to this Project.

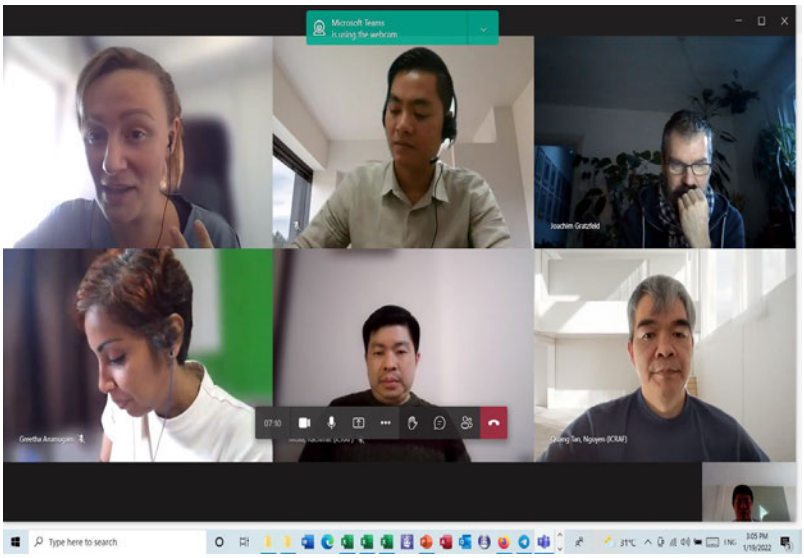
Whilst the pandemic led to a deferral of the project start by three months to October 2020, the challenging situation posed by the travel and face-to-face meeting restrictions experienced to date, did not diminish involvement of all project partners in planning and decision-making to realign activities with the new project schedule and ensure implementation. Regular exchange

between the project partners via online conferences – on average once to twice a month – has ensured a coordinated approach and agreement on needed project changes**.**

In Year 2, the Steering Committee composed of representatives from NAPV, ICRAF and BGCI and serving as a formal mechanism to monitor and evaluate project progress, met twice (18 October 2021 and 17 March 2021). This enabled adaptive management of the project still affected by the impact of COVID-19 as articulated in the formal Change Requests (see Section 3.1 Activity 0.1).

Preliminary contacts made with the Cambodian office of the Wildlife Conservation Society (WCS) (https://cambodia.wcs.org/) made in the first year of the project continued during Year 2 to further discuss complementarities and explore collaborative activities. Further contacts were also made with the National Council for Sustainable Development (H.E. Somaly Chan, Deputy Secretary General, General Secretariat of the National Council for Sustainable Development/Ministry of Environment), to promote the project in support of Cambodia's commitments to the Convention on Biological Diversity, the Aichi Biodiversity Targets and the United Nations Framework Convention on Climate Change (see also Sections 4 and 5). As a result of these regular contacts, the project manager Khou Eang Hourt at NAPV, was invited to the Ministry in Phnom Penh on 17 December 2021 to present findings on natural resource management and biodiversity conservation. This has led to the project manager being invited to apply for a proposal on Integrated Natural Resource Management due in April 2022 and to become a member of the species conservation group tasked with updating the National Biodiversity Strategy and Action Plan (NBSAP).

During Year 2, further contacts were established with the British Embassy in Phnom Penh. On 19 January 2022, a project introduction was made to team members of the British Embassy, including the Climate Change Policy Officer, Alexandra Jones, via a virtual, online event which was very well received. Moreover, an invitation for a joint project visit was also extended to the team at the British Embassy, scheduled for late March 2022. Unfortunately, due to a new surge of COVID-19 infections, the project visit had to be cancelled at short notice, and the associated training event (see Activity 1.3 and 2.6 Section 3.1) was held online.



Online project introduction to the British Embassy in Phnom Penh on 19 January 2022

The project has also expanded to the Viet Nam Fruit and Vegetable Research Institute (FAVRI) and Thai Nguyen University of Agriculture and Forestry (TUAF) to draw on their expertise in low-emission fruit tree cultivation.

In Year 2, the project also communicated with the Swiss non-profit foundation HEKS, working in Cambodia to promote organic agriculture of small-holder farmers amongst others. As part of its programme, HEKS supports cashew nut processing with the local community in Kampong Thom province. Currently, HEKS is conducting a feasibility study to expand its mandate to other provinces, with Preah Vihear being one of the target locations for their future activities. Drawing on this opportunity, further meetings between the project manager Khou Eang Hourt at NAPV and HEKS will be arranged to identify opportunities for future cooperation.

3. Project progress

3.1 Progress in carrying out project Activities

Output 1. The value of the forest and forest products to local livelihoods in the PVHS are assessed and understood and local ecological and market conditions for implementation of agroforestry practices are established.

Activity 0.1 Establish project steering committee to guide project activities, monitor progress and adaptively manage the project.

As reported in the Year 1 annual report, the steering committee was established at the beginning of the project composed of eight members: three from the National Authority for Preah Vihear (NAPV), one from the Department of Environment of Preah Vihear province, two from the International Center for Research in Agroforestry (ICRAF), and two from Botanic Gardens Conservation International (BGCI). In Year 2, the steering committee was expanded to include two representatives one each from the Sra-aem Commune Council and the Training of the Trainers (ToT) group, whilst ICRAF's Southeast Asian Regional Coordinator stepped down. The steering committee met twice online in Year 2 (18 October 2021 and 17 March 2021) **(Annex 4.1)**. These meetings were important to discuss and decide on needed change requests due to the impacts of ongoing pandemic during Year 2 on the project **(Annex 4.2)**.

Activity 1.1 Design and conduct surveys in year 1 (baseline) and in year 3 to characterize and measure the impacts of project on socio-economic and livelihood systems, farming systems, forest and wild plant use of local households (including typology of households for future intervention).

As reported in the Year 1 annual report, the survey was completed on schedule in the first year and will be repeated in the third year. The analysis of the household survey data had shown that the majority of households in the selected villages have relied on farm activities and collection of forest products for livelihoods, especially the Kuoy indigenous people of Sra-aem Cheung village. However, several factors such as unfertile soils, pest and diseases, and extreme climate especially drought have strongly restricted crop production. Financial limitation and lack of information on more sustainable and climate resilient farming systems have been two major obstacles for local people to apply measures to overcome the biophysical and climate challenges. In addition, limited market access and a strong reliance on middle-men have resulted in low and volatile prices of farm products. At the same time, local people have clearly noticed that overexploitation of forest products have led to serious forest degradation. Promoting more sustainable and climate-smart farming systems that integrate diverse products for sources of income and improvement of micro-climate, as well as creating opportunities for better market access and enhanced capacity of local people to undertake small-scale business, are keys to improve local livelihood whilst contributing to forest protection and rehabilitation.

Activity 1.2 Characterize successful local agroforestry practices in the four sample villages with relatively similar biophysical and climatic condition, as options for agroforestry models for interventions.

As reported in the Year 1 annual report, the characterisation survey of local agroforestry practices survey was carried out in the first year.

Findings from the characterization survey as expounded in a detailed report **(Annex 4.3)** generated in Year 2, show that local people have been aware of the benefits of agroforestry as a more sustainable farming practice mainly because of the ability of this system to generate diverse products and incomes. However, challenges in procuring quality seedlings and lack of information on appropriate design and suitable plot management options for agroforestry have restricted agroforestry development in the Sra-aem commune. The local communities prefer several commercial tree species such as cashew, mango, coconut or longan for income generation, and native species such as *Pterocarpus macrocarpus, Dalbergia cochinchinensis, Shorea obtusa or Dipterocarpus crispalatus* for maintaining soil fertility. These native species can likely provide a significant contribution to soil enrichment through the trees' litterfall. The local preferences create an excellent opportunity of introducing diversified systems with commercial and native tree species, and annual crops such as cassava or lemon grass as intercrops.

Activity 1.3 Conduct land suitability analysis for selected tree species combined with the participatory maps of vulnerability level, to identify suitable area for agroforestry development.

As reported in the first annual report, the preparation stage for the suitability assessment of selected tree species was carried out in the first year. It included participatory mapping with relevant local stakeholders from the communes within the Choam Ksant district on land use types and distribution over the district. Using the inputs prepared in the first year, the assessment of 7 fruit tree species (custard apple, papaya, jujube, guava, jackfruit, longan and pomelo) were completed in Year 2 and ICRAF presented the results online to Sra-aem commune members invited to a workshop organised by NAPV on 16 March 2022 **(Annex 4.4)**.

Activity 1.4 Design and conduct study on market opportunities and value chain for key agroforestry and NTFP products from the region in year 1.

As reported in the first annual report, the study of market opportunities and value chain for key agroforestry and NTFP products was carried out in the first year. Findings have shown that farmers are selling their farm products individually to local collectors. The market survey also showed that mango and cashew cultivated by smallholder farmers have high market demand but require further effort to add value at farm or regional levels. As most farmers grow these organically and sell the products individually in small batches, they are not able to fulfill larger demand. These farmers are facing direct competition from larger farms that have more financial capital to reach economies of scale in production and delivery. Markets of the larger farms include Vietnam and China. The survey findings also indicate the need to establish collective marketing units at village level to facilitate sales and add bargaining power. Business models will be recommended and examined following the detailed analysis of markets and value chains.

Activity 1.5 Develop recommended agroforestry models for trials, including benefit-cost analysis.

The agroforestry characterization survey (Activity 1.2) selected 10 of 55 observed agroforestry practices in the 4 project villages. These have been recommended as models because they have been shown to generate relatively high income (ranging from some USD [redacted] per ha in 2020), host diverse agro-biodiversity (i.e., minimum three different crop species), and have been practised by the farm households for more than five years, and according to farmers' perspectives, are more resilient to extreme weather events such as drought and strong winds. The project report also describes establishment and annual maintenance cost, and gross and net income in 2020 generated by the 10 selected practices.

Agroforestry design presentations made by project village representatives

In addition, through the training on agroforestry practices **(Annex 4.5 A-B)** conducted on 2 August 2021 and further communication with Training of the Trainers (ToT) farmers through the project Telegram group, the project also has devised up to 3 recommended agroforestry models per village, illustrated by using a 3D mock-up. The benefit-cost analysis of the recommended models illustrated using the 3D mock-up will be conducted in the third year of the project.

Output 2. Capacity of local communities to implement conservation farming and sustainable agroforestry systems and income derived from market-based, small scale businesses is increased in local PVHS communities.

Activity 2.1 Develop training materials and programs (on agroforestry system development, rural market system development, small-scale business development) for training of trainers and pilot farmers.

During Year 2, a series of training materials **(Annex 4.6 A-E)** were developed and disseminated among ToT members:

1. Training materials developed by ICRAF that describe basic principles of agroforestry practices **(Annex 4.6 A)**, and how to appropriately design agroforestry for optimal resource use including in home gardens;
2. An agroforestry module/curriculum **(Annex 4.6 B)** developed through the Life and Nature project coordinated by the Food and Agriculture Organization of the United Nations (FAO) that describes suitable ways to develop agroforestry, and provides recommended agroforestry models adapted to the Cambodian biophysical and socio-economic context;
3. A manual on organic fertilizer and pesticide production, and fruit tree cultivation and management;
4. A manual on low-emission cultivation techniques of 7 fruit tree species **(Annex 4.6 C)** developed together by ICRAF, FAVRI, and TUAF, translated from English to Khmer by NAPV; the manual includes aspects of suitability of crops to soil types and climate, cultivation techniques, bio-pest and disease management, and semi-organic fertilizer production for fruit trees;
5. A guiding leaflet on agroforestry practices **(Annex 4.6 D)**.
6. A training material on agribusiness for smallholders was developed by ICRAF that describes the concept of value chain, marketing, and agribusiness **(Annex 4.6 E)**.

Activity 2.2 Design market-based conservation farming and agroforestry on-farm trials/ demonstration plots for training.

As highlighted in the annual report of the first year, findings from the surveys conducted under Output 1 confirm the need to promote more sustainable and climate-adapted farming systems that at the same time create opportunities for better market access and enhanced capacity of local people to undertake small-scale business activities. Based on the findings from the surveys under Output 1, including those on the 10 selected agroforestry practices from the four project villages, the ICRAF team has been working in collaboration with NAPV and ToT farmers to identify combination options of trees and crops for the on-farm trials tailored to household and farm condition. In addition, the design of market-based conservation farming and agroforestry continues to be discussed by the project team and ToT farmers using the Telegram group through which the farmers can share details of crop products that have market potential and inspiring agroforestry outputs. Ideally, agroforestry plots with intercropping models are laid out in east-west orientation in order for sunlight to penetrate to the ground for as long as possible. Intervals between seedlings and distance from crops to fruit trees have been thoroughly discussed based on the training provided (Activity 2.3). To date, a total of 8 agroforestry trial farms have been established, and preparations for planting in 2022 in 4 more farms have been made.

Activity 2.3 Provide TOT trainings for villages leaders/ local officials (40 participants) and on-site trainings for 200 community members on market, small-scale business development, conservation farming and agroforestry.

During Year 2, a series of Activity 2.3-related training sessions were organised by the project team **(Annex 4.7)**:

1. Online training on agroforestry systems (2 August 2021), delivered by ICRAF and project associate and agroecologist Lilian Beck, University of Kassel, and facilitated and interpreted by NAPV. A total of 24 ToT members and 2 commune council members participated in the training. The training included introduction of agroforestry as a sustainable farming practice that can reconcile economic and ecological benefits, and different types of agroforestry and agroforestry-based home garden models (Activity 1.5). It also explained participatory development approaches and home garden models using a 3D mock-up.
2. Online training on low-emission fruit tree cultivation techniques (16-18 August 2021), organized by ICRAF and facilitated by NAPV. Due to the social restrictions imposed by the COVID-19 pandemic,

the number of participants attending in-person had to be limited to 10 ToT members and 2 commune council members. Delivered by experts in fruit tree horticulture from the Fruit and Vegetable Research Institute (FAVRI) and Thai Nguyen University of Agriculture and Forestry (TUAF) of Vietnam, and interpreted from Vietnamese into Khmer language by NAPV, the training expounded appropriate planting, maintenance and harvesting techniques for 7 species and highlighted the use of organic and semi-organic fertilizers and bio-pesticides to guide the development of low-emission fruit tree cultivation. During the training, the 3D mock-up presented in the first course was further developed by breaking into groups each representing the 4 project villages, to refine and present their preferred 3D mock-ups of agroforestry-based home garden options.

3. Knowledge exchange on fruit tree cultivation and agroforestry design, organised for ToT members from Techo Bos Sbov and Sen Chey villages (9 September 2021), and 14 ToT members from Sra-aem Khang Cheung village and Eco-village (11 September 2021). The training was held at a farm predominantly cultivating guava, jujube and longan. Key aspects illustrated through practical demonstrations included size of planting holes, installation of irrigation systems, managing waterlogging during the rainy season (Sep.-Oct.), suitability of fruit trees in accordance with soil type and geographical conditions, selection of planting materials, planting interval between fruit trees, pest management, pruning time and techniques. All participants were also invited to visit an agroforestry farm of a ToT member in Sra-aem Khang Cheung village. This farm is cultivating orange trees and wattle climber (*Acacia megaladena* var. *indo-chinensis*) as main crops, in addition to smaller areas with custard apple, coconut, pomelo, banana, and galangal. The objective of these exchanges was to provide ToT members with practical knowledge on the intercropping system, and the value of agroforestry for enhancing livelihoods. With this 0.3 hectare farm, generation of an income of over 14,000 USD per annum is possible, compared to farms with mono-cropping practices such as cashew plantations that generate an average annual income of 2,000 USD per hectare.
4. Knowledge exchange gathering on organic fertilizer and pesticide production (20 September 2021), organised at a ToT member's farm in Eco-village, for 20 ToT members and 2 commune council members. This ToT member has extensive experience in Indigenous Micro Organism (IMO)-based fertilizer production and its application to cashew plantations. In addition to IMO, this practical training also covered other fertilizer-pesticide methods, including Fermented Fresh Milk Bra (FMB) and organic pesticides to control insect infestations, as well as application of hormones to promote flowering, fruiting and shoot growth. A further exchange visit was organised to the farm of another ToT member in the Eco-village, one of the 12 agroforestry demonstration farms. This farm benefits from good drainage canals preventing soggy soil on crops and fruit trees in the rainy season whilst they are used for irrigation during the dry season. A number of project fruit tree species are grown on the farm including orange, custard apple and guava, with seasonal crops such yam, melon and chili.
5. Training on video production through Filmorago app (2 December 2021), delivered by Lilian Beck, and facilitated by NAPV. 16 ToT members, 2 commune council members, 7 NAPV staff and all project staff participated in the training. It started with an introduction about video shooting by using Open Camera, and process video by applying "Filmorago". This training aimed to provide knowledge to ToT farmers to produce videos at their farms, such as capturing good practice of agroforestry farming systems, and management of pests and diseases affecting crops, and share these with the wider community to learn from each other's experiences.
6. Training on fruit tree grafting techniques on 11 January 2022, organized at the farm of Oeur Sopheap, a ToT member, and attended by 20 ToT members, 2 commune council members, 2 NAPV staff, 2 nursery workers and all project team members. The training included techniques to install propping for approach grafting, preparation of soil mixture, selection of rootstock and scion, applying hormones, handling a knife to avoid any accident, cutting and shaping scion and stock, attaching/inserting and sealing. Mango, jujube, guava, jackfruit and jambolan plum seedlings were selected for the training. Besides training on grafting techniques, ToT members also shared a method to prune custard apple to produce fruits two times per year. All participants expressed their appreciation and strongly committed that they will apply this knowledge to produce more seedlings of high value fruit trees at their farm.
7. Training on value chain and market (29-30 March 2022), facilitated by the NAPV team, and delivered by ICRAF's Aulia Perdana, and Lang Seng Horng, a local consultant. 23 ToT members, 1 commune member and 3 NAPV staff participated in the training. The training aimed to provide

ToT members with knowledge of value chains, marketing, farming as a business, and costing and profit in order for them to properly plan for cultivation, selection of the right crops for planting and carrying out business operations. The training also included identification of potential crops for business (fruit trees, cashew, pea eggplant and chili), actors in business and trade chains (**Annex 4.8**).

Activity 2.4 Provide on-going support for establishment and maintenance of on-farm trials for sustainable agroforestry in pilot households through year 2 and 3.

Assisted remotely by the members of the ICRAF team, NAPV has been providing ongoing support through consultations with the ToT farmers on-site on their farms, as well as through the Telegram group, and will continue to do so. The project provided fruit tree seedlings and crop seeds to all ToT members including 14 fruit tree species (jambolan plum, jujube, guava, avocado, longan of fragrant aril, longan of thick aril, jackfruit of carrot variety, durian, orange, coconut, pomelo, sapodilla, rambutan, date palm and custard apple) and 3 fruit crops (dragon fruit, papaya and pineapple) as well as 10 vegetable crops (pea eggplant, long eggplant, chili, ginger, galangal, turmeric, morning glory, tomato, snap bean, tomato), in addition to 4 wild tree species (*Azardirachta indica, Pterocarpus macrocarpus, Dalbergia cochinchinensis* and *Afzelia xylocarpa*). Thanks to COVID-19 travel restrictions being further relaxed, ICRAF team members have been preparing for further in-person, on-site technical support in May 2022.

Training on fruit tree cultivation

Activity 2.5 Provide on-going support for market linkages and small business development for pilot households throughout year 1 and 3.

As mentioned in the first year report, linkages with private businesses, including local processors and exporters, have been initiated, including for example Santana, a cashew nut processing factory in Rovieng district, Preah Vihear province. In Year 2, market linkages for agriproducts were further discussed with the ToT and community members:

- Pea eggplant and chili: there are product collectors by villages, and there is one consolidator to buy products from the 4 villages. Community members at each village were identified as village collectors to link product to a product consolidator for transporting to a main trader based in Battambang province.
- Cashew nut: Market access to cashew nut is available during the harvest season, however the price is not stable and dependent on supply volume. However, farmers only sell the raw nut without processing.
- Fruits: NAPV is now constructing a welcome centre in the project area. Booths for selling local products will be established for each village to sell agricultural products to tourists. The establishment of community-based enterprises will be further explored in the third year of the project.

Activity 2.6 Policy recommendations on agroforestry and small-scale business developed and published by end of year 3.

In Year 2, a two-day workshop (15-16 March 2022) on conservation agriculture and agroforestry was organised, bringing together 59 participants from 8 commune councils, the agriculture and environment departments from Preah Vihear province, the environment and agriculture offices from Choam Ksant district, village chiefs from Sra-aem commune, ToT members as well as NAPV representatives from Preah Vihear and Koh Ker heritage sites. The project team members from ICRAF and BGCI as well as Lilian Beck (see Activity 2.3) joined the sessions online.The workshop aimed to inform local authority representatives about the project's objectives, share knowledge and recommend agroforestry practices for food security, income diversification, biodiversity conservation, and climate change resilience. The feasibility of scaling up agroforestry practices to other communes of Choam Ksant District formed also part of the discussions.

Output 3. Survival of threatened tree species through species recovery plantings, forest restoration activities and related forest management employment opportunities for local people are increased within the PVHS.

Activity 3.1 Two nurseries built with 20,000 seedling capacity with required supplies by end of year 2.

In addition to NAPV's existing nursery facilities (572m^2), the construction of the 2 nurseries, 710 m^2 and 400 m^2 respectively, was completed in Year 2. The nurseries are fully operational, have been equipped with an irrigation system (water tank, pipe and sprinkler), a net roof and a seedlings bed with brick frame. The two nurseries have a holding capacity of around 60,000 seedlings. Besides the completion of the nurseries, a dry compost and liquid fertilizer facility were added.

New project nursery

Activity 3.2 Employees recruited and contracts signed with NAPV for managers and staff of nurseries by end of year 1.

In Year 2, 3 employees (2 women and 1 man) continued to maintain and work in the nursery. In addition, 16 community members from Eco-village have also been involved periodically in nursery work such as potting, propagation, transplanting seedlings, etc. By the end of March 2022, 10,820 seedlings of 19 native and 5 ornamental tree species (representing some 51% of threatened species), continued to be managed in the nurseries, whilst an additional 18,050 seedlings of 8 native tree species, one fruit tree species, one flowering plant (of which 72% are relating to threatened species) have been newly propagated.

Activity 3.3 Contract for restoration consultant developed and signed in year 1.

In Year 2, NAPV staff continued the ecological restoration work, drawing on the eco-geographical analysis of the project area, growth monitoring plots and draft restoration plan carried out by the ecological restoration consultant in the first year.

Activity 3.4 Workshops to develop and implement restoration plan for NAPV with guidance of consultant and BGCI in years 1, 2 and 3.

In Year 2, the draft Forest Restoration Action Plan (FRAP) **(Annex 4.9)** was validated by the ToT members. The plan includes i) forest restoration work in Zone 2 (Conservation zone) and ii) tree diversity enhancement (native species and fruit trees) in the four villages on public land and on the farmers' small land holdings, linking with Activities 1.2 and 1.3 under Output 1 to trial new agroforestry models. The FRAP will be further refined during the third year and launched at the end of the project.

Activity 3.5 Restoration surveys designed and carried out in year 1 and species survival plots established in year 1 and monitored in years 2 and 3.

The 7 restoration plots identified and established (10m x 10m) in Zone 2 in Year 1 aimed at baseline study of species diversity, population density, and growth development (see Output 3 Indicator 3.5), continued to be monitored in Year 2. The survival rate of the planted seedlings has been found to be higher than that of naturally establishing seedlings **(Annex 4.10).** A comprehensive report on monitoring and the seedlings survival rate will be prepared in the third year.

Activity 3.6 Plant 15,000 trees over years 1, 2 and 3, and implement aftercare.

By the end of March 2022, some 18,325 seedlings of 20 tree species (**Annex 4.11**) had been planted in 6 areas (8,430 seedlings in the first year, and 9,895 in Year 2), including 4 restoration sites along road sides of Eco-village, and opposite the new nursery, covering an area of around 8 hectares. Caring for planted and naturally established seedlings was carried out over an area of 4.9 hectares; moreover, a total area of 7.6 hectares of firebreaks at 5 locations was accomplished. These efforts involved some 19 villagers (11 women) who participated in the restoration activities.

Enrichment planting with native trees at Ko Muoy, Sra-aem commune

Output 4. Forest conservation and livelihood opportunities are linked through management plans, and perceptions of benefits of forest conservation to livelihoods is increased while harmful activities are decreased.

Activity 4.1 Run a public outreach campaign to strengthen links between forest conservation and livelihood opportunities in years 1, 2 and 3.

The public outreach conceptual framework **(Annex 4.12)** was finalised in Year 2, and an outreach campaign was initiated, including:

- A total of 5 poster themes (agroforestry, planting trees in the village, values of the dry forest ecosystem, sustainable Non Timber Forest Products (NTFPs) collection practices, and forest fire), were completed with drawings and printed for dissemination. These posters were distributed among the local community, 8 commune councils for educational purposes in their community area, as well as among key concerned stakeholders at district and provincial level. These posters have also been installed along road sides in Zone 2 (conservation zone) for awareness raising.
- 8 posters on successful agroforestry have been produced for use as training materials.

- A project page (https://www.facebook.com/គម្រោង កសិកម្ម-និងព្រៃឈើ-100706205766944/) was developed and 8 project's events, technical documents and educational materials have been posted;
- Three case studies on agroforestry were written in both Khmer and English and posted in the project's page.
- Project events were also posted on the pages of NAPV and Ministry of Culture and Fine Arts.
- NAPV has recently developed its own website (https://napv.gov.kh), and the project's workshops have been written and posted on the website.
- A privately-owned TV station was contacted to capture information of the agroforestry dissemination workshop to broadcast to the public.
- The production of an agroforestry film for public outreach has been initiated and will be published by the end of the third year.

Activity 4.2 Hold forest management plan meetings between NAPV and community members held and plan developed by end of year 3.

Consultation on the first draft of the Forest Restoration Action Plan (FRAP) (see Activity 3.4) with the local community was held during the project training workshop. Concurring with the contents of the plan, some members highlighted the occurrence of natural seedlings of project target species on their farms, such as *Pterocarpus macrocarpus* and *Dalbergia cochinchinensis*.

Activity 4.3 Monitor fire events and forest use practices over years 1, 2 and 3.

The map of forest fire incidence in Zone 2 generated in the first year was updated in Year 2. A method is being developed to record the occurrence and frequency of forest fire within and adjacent to the restoration plots (Activity 3.5). Based on ground truthing, none of the managed monitoring plots were found to have been burned in 2021 and 2022.

3.2 Progress towards project Outputs

Output 1. The value of the forest and forest products to local livelihoods in the PVHS are assessed and understood and local ecological and market conditions for implementation of agroforestry practices are established.

As reported in Year 1, major progress has been made in Year 1 towards achieving Output 1. The value of the forest and forest products to local livelihoods in the PVHS at the start of the project (Oct 2020) was assessed through various surveys. Baseline data from 221 households (about 25% of the total population of farm-based households) in the four project villages were collected and analysed. Data on biophysical characteristics of main agroforestry practices in these villages weren collected, and analysed. A study on market opportunities and value chain for key agroforestry and NTFP products was also conducted **in year 1. In year 2,** the market study report has been prepared and findings from the studies conducted in Year 1 used in the design of agroforestry practices established at the farm and demonstration plot levels

Use of Indicators to support progress towards the Output:

- Indicator 1.1 Surveys of socio-economic and livelihood systems, farming systems, forest and wild plant use in PVHS communities collected at baseline (2020) and end of project (2023) will be used to inform agroforestry and agribusiness planning and implementation.

Progress: As mentioned in the report of the first year, baseline survey data on socio-economic and livelihood systems, farming systems, forest and wild plant use in PVHS communities collected in December 2020, were used for agroforestry and agribusiness assessment and planning. Findings from the surveys have informed the project team and local community in the discussion on options of trees and crops for the on-farm trials and the design of market-based conservation farming and agroforestry. An end-line survey on socio-economic and livelihood systems, farming systems, forest and wild plant use in PVHS communities will be conducted in 2023.

- Indicator 1.2 Land-suitability analysis conducted for selected tree species and participatory mapping of vulnerable sites used to identify suitable sites for agroforestry development in year 1 (2020).

Progress: As reported in the report of the first year, participatory mapping and soil sampling were carried out in 8 communes of Choam Ksant district to produce key inputs for the land suitability

analysis. In Year 2, the assessment of 7 fruit tree species was conducted and the results were discussed with Sra-aem commune members on 16 March 2022.

- Indicator 1.3 A report produced on market opportunities and value chain for key agroforestry and NTFP products from the region in year 1 (2020).

Progress: Market opportunities and value chain for key agroforestry and NTFP products from the region have been collected and a report has been prepared **(Annex 4.7)**.

- Indicator 1.4 Market opportunities created for at least 4 crop species by end of year 3 (2023), and agroforestry models developed and guidance documents produced by project partners by end of year 1 (2020).

Progress: A market and value chain survey has been conducted. The findings have been used to inform the design of agroforestry models and guidance documents **(Annex 4.8)**.

Output 2. Capacity of local communities to implement conservation farming and sustainable agroforestry systems and income derived from market-based, small scale businesses is increased in local PVHS communities.

Except for Indicator 2.1, good progress has been made towards achieving this Output as articulated below.

Use of Indicators to support progress towards the Output:

- Indicator 2.1 At least 40 community leaders engaged in train-the-trainer mentorship group in years 1 and 2 (2020, 2021) and are facilitating further training sessions in years 2 and 3 (2021, 2022).

Progress: 25 ToT and commune council members, 62.5% of the total expected number, have been provided training to date. The pandemic continued to make it very challenging to achieve a number closer in line with the indicator.

- Indicator 2.2 At least 200 people (40% women) are trained in sustainable agricultural practices for high-value crops and small business development by end of year 3 (2023).

Progress: In addition to the ToT members and 2 commune council members, a total of 130 farmers from the four villages were provided training in agroforestry practices. This number is expected to rise during the last year in the project.

- Indicator 2.3 By end of project (2023) 100 households are reporting cultivation of at least one new high value crop and 150 households report at least 10% increase in monthly income from crops and trees compared to the start of the project (2020).

Progress: 129 community members have been found to be interested in the integration of pea eggplant, chili, galangal and ginger in their fruit tree farms. 18 community members are keen on integrating chili, galangal and ginger within their farms, and 2 community farmers are interested in integrating only galangal and ginger within their farms. Further community members who did not attend the village workshop also expressed their interest in planting pea eggplant within their fruit tree farms.

- Indicator 2.4 Regional recommendations on agroforestry practices and small scale business practices for buffer communities of protected areas are produced and circulated to regional and national policy stakeholders.

Progress: A consultation workshop to promote agroforestry with 8 communes of Choam Ksant district, of which 7 communes are located within protected areas under the jurisdiction of the Ministry of Environment was held on 15-16 March 2022. In addition, a short guideline on agroforestry design **(Annex 4.6 D)** was shared with the commune council. Each commune received 50 copies of the leaflet for dissemination to their community members.

Output 3. Survival of threatened tree species through species recovery plantings, forest restoration activities and related forest management employment opportunities for local people are increased within the PVHS.

Significant accomplishments continued to be made during Year 2 towards achieving Output 3:

- Indicator 3.1 Two new threatened tree nurseries are built with 20,000 seedling capacity total by the end of year 2 (2022).

Progress: 2 nurseries with a total size of 1,110 m^2 including irrigation system, were established. Combined they have a holding capacity of some 60,000 seedlings.

- Indicator 3.2 Forest restoration plan developed by NAPV and BGCI to include natural regeneration and assisted regeneration activities by end of year 2 (2022).

Progress: A Forest Restoration Action Plan (FRAP) was finalized based on an eco-geographical survey and consultation with the local community. The restoration plan encompasses capacity building, restoration activities, promoting agroforestry such as by integrating native threatened tree species, fruit trees and non-woody crops, and strengthening cooperation in the Sra-aem commune. In summary, the FRAP has included three strategic objectives (SOs) and a number of key actions: SO1: practical forest restoration using different methods according to the eco-geographical site conditions (7 actions); SO2: capacity building on forest restoration techniques and agroforestry for NAPV staff and local communities (4 actions); SO3: opportunities and areas for medium and long-term cooperation between the government and NGOs, development partners, research institutions, and academia (4 actions).

- Indicator 3.3 Ten community members employed in leadership positions in nurseries by end of project (2023).

Progress: 3 community members (2 women) have been employed to work at the nursery throughout Year 2, acting as mentors for other community members who wish to learn various propagation techniques. Another 16 community members (11 women) from Eco-village were occasionally hired to work at the nursery.

- Indicator 3.4 At least 20 community members are employed in tree planting and maintenance activities (500% increase compared to pre-project) by end of year 3 (2023).

Progress: 19 community members (11 women) from Eco-village have been employed in forest restoration activities.

- Indicator 3.5 Restoration plot studies of threatened tree species established in year 1 and re-surveyed in years 2 and 3 clarify requirements for species recovery, and survival of seedlings planted in restoration areas is 90%.

Progress: The 7 monitoring plots established in the first year have been monitored to gauge the levels of survival. The results indicate that naturally regenerating seedlings have a higher mortality rate than the planted seedlings **(Annex 4.10)**. The plots are monitored two times (dry season and rainy season) every year. Findings from the monitoring plots will be documented and used for public engagement purposes on impact of forest fire.

- Indicator 3.6 15,000 trees planted (130% increase compared to pre-project) including at least 5 threatened species by end of project (2023).

Progress: a total of 18,325 seedlings relating to 20 tree species grown in the nursery have been planted to date (8,430 seedlings in the first year, 9,895 in Year 2) over 48 hectares. This includes 5 threatened species included on the IUCN Red List (*Dalbergia cochinchinensis, D. oliveri, Pterocarpus macrocarpus, Afzelia xylocarpa* and *Dipterocarpus alatus*) **(Annex 4.11)**. In addition, assisted natural regeneration and establishment of firebreaks were also carried out. The number of seedlings being used for restoration has increased to 122%.

Output 4. Forest conservation and livelihood opportunities are linked through management plans, and perceptions of benefits of forest conservation to livelihoods is increased while harmful activities are decreased.

Some progress has been made towards achieving Output 4, inter alia, preparation of a conceptual framework for public outreach **(Annex 4.12)**; development of posters for promoting awareness on agroforestry, the values of the forest ecosystem and participation in restoration; as well as a draft participatory Forest Restoration Action Plan (Indicator 3.2) as a result of consultations with community members and the village chiefs of the four villages.

- Indicator 4.1 80% of respondents report increased perceptions of the importance of conserving forest following education programmes by project end (2023). Building on the survey results of the 221 households under Output 1, this Output will be measured in the third year to assess changes in perception of the value of forest conservation efforts as implemented by the project.

- Indicator 4.2 Participative forest management plans developed with management authorities in 4 villages by end of year 3(2023).

Progress: A participatory Forest Restoration Action Plan (FRAP) **(Annex 4.9)** was finalized in Year 2.

- Indicator 4.3 Number of fires reported by NAPV ranger staff in restoration areas decreased by 20% by project end (2023) compared to pre project baseline levels.

Progress: The map of forest fire incidence in Zone 2 produced in 2020 was updated in Year 2. A method is being developed to record the occurrence and frequency of forest fire within and adjacent to the restoration plots. Based on ground truthing, none of the managed monitoring plots were found to be burned in 2021 and 2022.

- Indicator 4.4 150 households are reporting 20% reduction in days spent in NTFP collection between year 1 and year 3 (2023). As with Indicator 4.1, building on the survey results of the 221 households under Output 1, this Output will be will be measured in the third year to assess changes in NTFP collection as a result of the project.

3.3 Progress towards the project Outcome

Outcome: Forest degradation and threats to native plant diversity are decreased through improved and diversified livelihoods linked to forest conservation for local communities of the Preah Vihear Heritage Site

Despite the ongoing pandemic during Year 2 of the project, progress toward the achievement of the expected project Outcome has generally been on track. The Indicators are deemed adequate to measure project advancement.

Summary key progress towards achieving the Outcome using the Outcome Indicators:

- Indicator 0.1: 100 households are reporting cultivation of at least one new high value crop and 150 households report at least 10% increase in monthly income between start of project (2020) and end (2023).

Progress: Based on the consultation meetings with community members in the 4 villages, 130 community members together with 22 ToT members and commune council members are interested in cultivation of high value crops (pea eggplant, chili, galangal and ginger; see progress towards Output Indicator 2.3). Cultivation work will start in April/May 2022.

- Indicator 0.2: At least 30 PVHS community members are employed in nursery management, tree planting and restoration activities by end of the project 2023.

Progress: In Year 2, 3 community members who belong to subsistence households have been employed at the nursery, and another 3 community members were employed for restoration work, whereas another 16 community members were employed periodically for both nursery and forest restoration activities.

- Indicator 0.3: The number of days annually spent collecting wild plant species for subsistence and income generation reported by community members decrease by 20% between start of project 2020 and end 2023.

Progress: As reported on in the first year, data on collection of wild plants and associated labour days have been collected in 221 households, to serve as the baseline (2020) for measuring the change from of project start and end (2023). The data show that 99 out of 221 households spent an average of 11.7 days per year to collect forest products, ranging from 2 to 180 days. The remainder 122 households did not spend any labour day on forest products. For subsistence purposes, farmers in Sra-aem Cheung village who have collected forest products spent more days per year than those in other villages. For income purpose, however, farmers in Eco-village had the highest average number of days spent on collecting forest products **(Annex 4.13)**. Agroforestry trials established by the project include both long-term (e.g. fruit trees) and immediate income generation (e.g. annual crops) opportunities. The income generated from nurseries, restoration activities and agroforestry trials established by the project is expected to address the needs of wild plant species conservation and income generation from forest products.

- Indicator 0.4: The number of fires observed and reported in protected forest areas is reduced by 20% between pre-project numbers and end of project (2023) and 90% of threatened tree seedlings planted in restoration areas survive at end of project.

Progress: The map of forest fire incidence in Zone 2 produced in the first year, was updated during Year 2 **(Annex 4.14)**. A method being developed to record the occurrence and frequency of forest fire within and adjacent to the restoration plots. Based on monitoring, there was no fire occurrence at the restoration plots in Year 2.

3.4 Monitoring of assumptions

All project assumptions are still valid as expounded below. In addition, 2 more assumptions were added at the end of the first year (see end of this section).

Outcome Assumption 1: Local communities and authorities open to participation in project activities and training opportunities (The Sra-aem Commune Council and community leaders are a project partner and have indicated their willingness to participate)

The main challenges of local farmers are access to seedlings, technical horticultural knowledge and market access. The project is striving to address these challenges by enhancing horticultural capacity and providing propagules and seedlings, and exploring and developing new market opportunities in collaboration with the target communities. These efforts serve as major incentives for the local community and authority to engage in the project.

Outcome Assumption 2: Mother trees of quality planting materials and viable propagules are available and identified for home gardens, agro-forestry and restoration activities (some species don't produce seed every year).

The Preah Vihear Heritage Site is home to many native threatened tree species, and some mother trees in healthy state have been recorded and mapped for phenology monitoring to anticipate and plan the optimal seed collection time. The project also supports the establishment of two new nurseries with an ultimate capacity of holding approximately 60,000 seedlings, which will provide an important and secure stock of plants including native trees, fruit trees, non woody crops and ornamental species to supply agroforestry, home garden and restoration activities **(Annex 4.15)**.

Output 1 Assumption 1: Community members are co-operative and receptive to new methodologies and approaches.

The socio-economic and agroforestry characterization surveys have shown the scope and potential to improve and expand agroforestry in the project area **(Annex 4.3 and 4.13)**. As this project seeks to diversify agroforestry practices including the use of native species and help develop new markets for crops sought after, the communities are engaging in the project work.

Output 1 Assumption 2: Spatial and other data is available and accurate for use in land-suitability analysis.

Existing data based on a review of literature has been enriched and validated through the participatory mapping and soil analysis under this project **(Annex 4.4)**, as highlighted under Activity 1.3.

Output 2 Assumption 1: Community members are co-operative and receptive to new methodologies and approaches.

See comment under Output 1 Assumption 1.

Output 2 Assumption 2: Viable propagules are available for home gardens, agro-forestry and restoration activities (some species won't produce seed every year).

See comment Outcome Assumption 2.

Output 3 Assumption 1: Extreme drought events will not occur or greatly impact nursery or planted trees.

The nurseries will be equipped with net roofs which help shade seedlings. Outplanting is timed with the onset of the rainy season.

Output 3 Assumption 2: Grazing pressure from released livestock will not impact planted trees.

The grazing pressure in Zone 2 (Conservation zone) is not significant with livestock generally remaining within Zones 3 and 4.

Output 3 Assumption 3: Seed produced by mother trees is sufficient for seedling production.

See comment under Outcome Assumption 2.

Output 4 Assumption 1: All communities will see the benefits of forest conservation and are willing to contribute to forest management plans.

The communities participated in the development of the Forest Restoration Action Plan (FRAP) as elaborated under Output 3 Indicator 3.2. suggesting they value the development of the FRAP.

In the context of the COVID-19 pandemic and based on the understanding gained from the implementation of Output 1, the following assumptions had been added at the Outcome level at the end of the first year:

- COVID-19 pandemic will not cause long-lasting lock-down in the project area.

The COVID-19 pandemic continued during Year 2, resulting in frequent locked-down in the project area, and not allowing people to travel between the villages. The effects however were effectively managed as articulated in the 2 change requests that were approved by the Darwin Initiative, with no major impact on project delivery.

- Institutional support from local authorities is in place for marketing of key agricultural products and NTFP.
The project is being implemented in close coordination with the Sra-aem commune council, the 4 village authorities and the local community who continue to fully support the work as shown throughout this report. This has also attracted the interest of other communes in Choam Ksant district, such as Yeang, Kantuot, Choam Ksant, Toek Krahorm, Pring Thom, Rumdoh Srae and Morokot. Each leader of these communes was provided with 50 copies of the leaflet on agroforestry to further disseminate within their communities.

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

Impact: Community-based forest conservation is linked to sustainable farming practices and diverse income opportunities throughout Cambodian communes and elsewhere in the region.

A key impact of the project is to expand opportunities for short-term community benefits to longer term impact by upscaling sustainable agroforestry models and creating new markets. In parallel, dry forest ecological restoration including assisted regeneration using native, rare and threatened trees species is expected to establish the foundations for restoring and enhancing forest ecosystem services including climate regulation. Ultimately, this will increase the number of people benefiting from the work initiated under this project, providing new employment opportunities and more secure livelihoods that contribute to reducing poverty in the long run.

As reported in the first year, initial research and baseline information have been established through various surveys including disaggregated analysis by socio-economic activities and gender **(Annex 4.13)**. Alongside the major focus on capacity building, further development of agroforestry trials and forest restoration activities during Year 2, this will enable benefits to be quantified at the end of the project based on project involvement and gender within communities, showing the higher level wider impact of the project on wellbeing.

The project is also making a major long-term contribution to the development of horticultural knowledge and knowhow for the propagation of threatened trees presenting keystone species of the dry forest habitat including rare legumes and rosewoods, such as *Afzelia xylocarpa* (Endangered)*, Dalbergia cochinchinensis* (Vulnerable), *Dalbergia oliveri* (Endangered) *and Pterocarpus macrocarpus* (Endangered) as well as *Dipterocarpus alatus* (Vulnerable)*, Dipterocarpus intricatus* (Endangered), *Shorea roxburghii* (Vulnerable), *Anisoptera costata* (Endangered) and *Hopea ferrea* (Endangered). Through employment at the nursery, the workers have become knowledgeable in propagation and nursery maintenance techniques and are able to guide other local community members in all aspects relating to the nursery. The horticultural needs of many of these species are not well established, let alone many have not been brought into scalable propagation. As some of these species are also native to the neighbouring countries including Thailand, Laos and Viet Nam, the knowledge generated by the project will be of wider regional relevance for use in other initiatives ,that link forest conservation and poverty alleviation.

4. Project support to the Conventions, Treaties or Agreements

Sustainable Development Goals:

SDG 1 (no poverty), SDG 2 (zero hunger) and SDG 8 (sustainable economic growth / productive employment): The baseline for measuring the contribution to these SDGs has been established through the household and agroforestry characterisation surveys that were carried out in Year 1. By providing training and developing market opportunities in the second and third year, prospects for diversified and sustainable subsistence and farming income will be trialled.

SDG 5 (gender equality): Gender equality is an underlying principle of the project, which will promote equivalent participation in activities and distribution of project benefits among women and men. The baseline surveys carried out under this project specifically include female-headed households. Around 24% of the households covered in the survey are female-headed. We also included inquiries on the roles of female and male farmers and market players in the value chain assessments to identify and map the governance of the value chain as reported on in the annual report of the first year. An overview of the number of women included in the project in Year 2 is in Section 6.

SDG 13 (combating climate change) and SDG 15 (life on land): As outlined above on progress made in the implementation of activities under Output 3, approximately 13,000 seedlings of threatened tree species have been established and planted in the conservation zone of PVHS, and on public land in the villages as well as in farms of individual households between 2020 and 2022. These efforts will help offset carbon emissions whilst contributing to the recovery and sustainable use of degraded forest habitat. Through further threatened tree planting and forest management activities in the second and third year, the project will contribute to the improved connectivity of dry deciduous forests and in the project area and further carbon offsetting.

SDG 17 (partnerships for the goals): This project itself presents a multidisciplinary partnership working at the interface between conservation and livelihood enhancement, and promoting North-South and South-South cooperation through its partners located in Cambodia, Viet Nam, Indonesia and the United Kingdom.

This project is helping Cambodia to meet its obligations to the Convention on Biological Diversity (CBD) by addressing the following Aichi Biodiversity Targets and the targets of the Global Strategy for Plant Conservation (GSPC):

Aichi T1 and GSPC T14 (Raising awareness): Public outreach components of the project, in particular activities under Output 4, are raising awareness of the need for biodiversity conservation and sustainable use for livelihood security.

Aichi T19 and GSPC T3 (knowledge enhancement and transfer, and methods/best-practice): Propagation techniques and horticultural needs for threatened trees and other species of socio-economic importance such as *Dalbergia cochinchinensis* (VU), *D. oliveri* (EN), *Pterocarpus macrocarpus* (EN), *Sindora siamensis* (LC), *Peltophorum dasyrachis* and *Afzelia xylocarpa* (EN), *Syzygium cumini* (LC), *Phyllanthus emblica*, *Dialium cochinchinensis* and *Kaempferia galangal* are being developed (Output 3). Specialised training for local community members in agroforestry and sustainable horticulture, soil improvement and water management practices contributed to knowledge sharing and cooperation for biodiversity conservation was provided during Year 2 as outlined in this report **(Annex 4.7)** and will be pursued in the third year.

Aichi Ts5, 12, 14 and 15; and GSPC Ts4, 7, 8 (habitat and species conservation and ecosystem services recovery): The selection and propagation of project target species **(Annexes 4.15 and 4.16)** has been initiated (dry forest keystone tree species and species of socio-economic importance). These taxa will be used in development of sustainable management practices of the dry forest habitat, contributing to the restoration of degraded land and reconnecting forest fragments. In addition, species and habitat recovery activities provide watershed protection and improved soil health in and surrounding the PVHS.

Aichi T7 and GSPC T6 (sustainable management of forests and agriculture, promoting biodiversity): The knowledge gained through the surveys and scientific study of site and market conditions and opportunities carried out in Year 1, will advance sustainable farming methods in PVHS .

This project also contributes to the objectives of the United Nations Framework Convention on Climate Change (UNFCCC): Art. 2 and Art. 7 (stabilising and reducing greenhouse gas

concentrations in the atmosphere / enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change): Forest restoration activities under Output 3 of this project initiated in the first year and consolidated in Year 2 and further pursued during the third year will contribute to these goals, thereby also supporting Cambodia's commitment to the Paris Agreement under the UNFCCC.

Regular contact with the CBD focal point and the National Council for Sustainable Development (NCSD), Ministry of Environment in Phnom Penh initiated since the development of the Darwin Partnership Project (DARPP199) in 2019, is being maintained. As a result of these contacts, a project manager was invited by the NCSD to attend a workshop to disseminate findings concerning with natural resource management and biodiversity conservation in northern Cambodia (17 December 2021), and encouraged to apply for a Natural Resource Management (INRM) grant. The UK embassy has had communication with Chhin Neth, the director of the Department of Biodiversity, of the General Secretariat of the National Council for Sustainable Development (GSSD), alongside Khou Eang Hourt, the project manager. This paves the way for the project to continue communication with GSSD/NCSD to explore future funding opportunities.

5. Project support to poverty reduction

The beneficiaries of this project are forest resource-reliant and agricultural-based households whose livelihoods are subsistent. They mainly practice monoculture and rely on only few main cash crops (cassava, cashew nut and mangos) for their livelihoods, leading to a number of issues including soil degradation, wild forest resources overexploitation and insecure livelihoods. This project supports poverty alleviation through a number of ways by responding to the above challenges, including:

- Changing the traditional practice of monoculture and dependence on a few crops to agroforestry which helps diversify products for income generation, food security, soil conservation and adapting to climate change. For instance, as a result of the project, over 160 community members are interested in cultivating a diverse range of crops on their farms. At least 7 fruit tree species (give reference here where in the report these are named) suitable to the local conditions have been introduced.
- Providing farming knowledge and applying new agroforestry techniques through training and knowledge exchange. ToT members were provided a series of vocational training on grafting, branch pruning and cultivation techniques in order for them to produce more seedlings of high value fruit trees for their own uses and sale within their community. The knowledge will also be transferred to other members of the local community.
- Providing new enterprise development options and value chain knowledge through training. Based on the discussions during the training sessions, market linkages of agriproducts were identified and developed, in particular with a focus on shortening long market chains.
- Enhancing nursery capacity to produce fruit trees and other crops of socio-economic importance as well as threatened native forest trees to support agroforestry and restoration. Saplings generated via seed and vegetative propagation carried out at the nurseries established by the project, are providing for diversification of the agricultural practices of the local community.

Particularly notable contributions made by the project in Year 2 to poverty reduction in the 4 villages include:

- Training and exchange visits relating to agroforestry, fruit tree cultivation, grafting, fertiliser development, and video production (Indicator 2.1);
- Workshops to introduce agroforestry techniques to the 8 communes of Choam Ksant district (Indicator 2.4);
- Around 152 villagers (130 community members and 22 ToT members) are interested in planting high value crops, all of whom received support from the project through the supply of seeds (Indicator 2.3);
- A further 400 m^2 nursery area was added to the existing 710 m^2. A total of 28,870 seedlings were generated by March 2020 (Indicator 3.1);
- Tree enrichment planting with some 9,895 seedlings of 19 native species has been carried out on 7.7 hectares (Indicator 3.6).

6. Consideration of gender equality issues

The project takes gender equality into account through various components. On average, female participation for all activities reached 30.6% in Year 2. Even though more men are involved in the training activities, the benefits are still shared within their households. Table 1 summarises women participation for different project activities.

Table 1: Overview of participation in project activities disaggregated by gender (women)

Activities	Total participants	Female	Percentage of female participation
Agroforestry model design	30	8	26.67
Cultivation techniques of 7 fruit tree species	28	8	28.57
Exchange visits to learn about cultivation techniques of fruit trees for ToT members from Bos Sbov and Sen Chey villages	16	5	31.25
Exchange visits to learn about cultivation techniques of fruit trees for ToT members for Sra-aem Khang Cheung and Eco-village	22	3	13.64
Training on organic fertilizer and pesticide production	29	9	31.03
Training in video production	31	8	25.81
Knowledge exchanges on fruit tree grafting	31	8	25.81
Workshop on agroforestry	59	14	23.73
Nursery labour	19	13	68.42
Forest restoration work	19	11	57.89
Total	**284**	**87**	**30.6**

7. Monitoring and evaluation

A project Steering Committee (SC) was established at the beginning of the project to lead monitoring and evaluation of project progress. The SC is composed of 8 members: 3 from the National Authority for Preah Vihear (NAPV), 1 from the Department of Environment of Preah Vihear Province, 2 from the International Center for Research in Agroforestry (ICRAF), and 2 from Botanic Gardens Conservation International (BGCI). Additional 2 steering committee members have been included, one of whom is a ToT member, and another one is a representative from the Sra-aem commune council. In Year 2, the SC met twice (see Activity 0.1 Section 3.1). Additionally, regular online meetings were held between the key project partners (NAPV, ICRAF and BGCI) to update all members on project progress, address issues and discuss solutions.

8. Lessons learnt

Although the training workshops held online due to COVID-19 are considered an effective tool to keep project implementation on track, low internet signal presented a disruption occasionally as did sporadic electricity cuts. Drawing on these experiences, preparation of handouts in Khmer, and recorded audio presentations were very helpful to have when these occurred, as was the availability of a generator.

Organizing virtual or hybrid events has also been an effective approach to ensure the project's implementation and participation of a larger group and a broader array of partners and stakeholders. The project also engaged capable local partners and consultants to conduct group discussions, trainings, workshops, and interviews when travel restriction inhibited the project team's ability to visit project sites and partners. These adaptive actions were highly successful and will also be utilised in the future as and when needed.

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

Account for and track adaptation in response to the two key lessons learned (27-015 AR1, section 9), on language and adapting activities to community routines.

The issues faced in the first year related to occasional misunderstandings as a result of language constraints, were no longer felt in Year 2. This is largely due to the frequent interaction amongst the project partners as articulated in this report, as well as a more in-depth familiarisation of all partners with the terminology used following two years of project implementation.

The planning of project activities needing to take into account the daily work and routine of local communities involved in the project as reported under 'Lesson learnt' in the first year, had been made as a general recommendation for similar, new projects. When planning for training workshops under this project, the close interaction of the NAPV project leader, Khou Eang Hourt, with the local community representatives, ensured also during Year 2 best-possible coordination, considering occupations of the farmers, weather conditions and regulations related to the ongoing COVID-19 pandemic.

Report systematically on adaptations in response to recommendations made (in award letter in this case, in Annual Report Reviews in subsequent years):

• *while gender was addressed well, the participation risks of vulnerable groups could have been more strongly presented and should be considered during project implementation;*

As reported in the first year, to make sure that vulnerable groups are not left behind, the household surveys included female-headed, farm-dependent, and economically poor households. Members belonging to these groups are also included in the training workshops delivered under this project as well as the agroforestry trials and forest restoration activities.

• *more detail on the activities would have been welcomed, e.g. what kind of public outreach campaign? how many species survival plots will be established?*

As regards the public outreach component (see Output 4, Activity 4.1), a conceptual framework was completed as a guide for the outreach programme activities, e.g. 5 project themes were completed as posters relating to native species diversity, drivers of change of the dry forest ecosystem, benefits of agroforestry, etc. Other outreach tools of the project include social media, videos and TV for promotion of the agroforestry objectives of the project.

As highlighted under Output 3, Activity 3.5, 7 restoration plots have identified and established.

• *it was not clear that the individuals involved in harmful activities will be engaged in the project;*

Refer to Output 4 which presents an integrated strategy to engage local communities in agroforestry and forest restoration efforts.

• *the economic viability of the exit strategy is not adequately articulated.*

Whilst emphasis will be placed on the development of the exit strategy during the third year, work initiated to date has been designed with long-term sustainability in mind. For instance this includes using the ToT members for agroforestry knowledge dissemination.

• *the logframe could be strengthened:*

- the wording of indicators and Methods of Verification (MoV) need reviewing for clarity, and the type of evidence presented as the MoV checked. For example, how will the project know that regional level recommendations are accessible to policy stakeholders (MoV 2.4)?

As regards MoV 2.4, close contacts to commune councils are maintained throughout the project (see e.g. Output 2, Activity 2.4 and Output 4, Activity 4.1). In addition, regular contact with the CBD focal

point and the National Council for Sustainable Development (NCSD), Ministry of Environment in Phnom Penh as highlighted in Section 4, assists in promoting agroforestry and forest restoration with policy stakeholders. During the third year, further efforts will be made to engage policy makers at national and regional levels, aiming to promote the project achievements for replication in other parts of Cambodia .

- please note that sharing education materials will not provide evidence of increase perception (Mov 4.1a) but pre-post surveys will if the right questions are asked (MoV 4.1b).

Building on the project surveys carried out during the first year, further surveys will be undertaken in the third year to assess changes in perception of the value of forest conservation efforts as implemented by the project.

10. Other comments on progress not covered elsewhere

Drought as well as heavy rain in September and October 2021, and occurrence of pests have impacted on the agroforestry trials. For instance, this has led to lower yields of cassava tubers and cashew nuts. Limited yield of mango as a result of the damage caused by the mango fruit fly has been another barrier to enhancing livelihoods of local communities. However, this project aims to diversify fruit trees and crops on farms for better resilience in the event of disasters, and builds horticultural capacity such as in grafting techniques and organic fertiliser and pesticide production. The project also implements small-scale water resource development, such as the construction of 3 ponds and 2 micro weirs along two rain-fed streams to secure water provision throughout the year. In addition, connecting agricultural products generated on the farm to the end market using ToT members, is one of the project's approaches towards implementation of more sustainable agroforestry systems, and presents an important element of the exit strategy which will be further developed in the third year.

11. Sustainability and legacy

As with the first year, the project has had to deploy a number of adaptive change management techniques due to COVID-19. Whilst this has come with additional challenges for all project partners, these adjustments were successfully implemented, demonstrate the high flexibility of the project team and are thought to have also a beneficial influence on the sustainability and legacy of the project as a result of reaching out to a wider group of stakeholders involved in the project. 2021 presented the peak of the pandemic in Cambodia. Despite the bottlenecks and restrictions, by and large the project implementation was on track, especially relating to forest restoration and nursery operation activities. Whilst large group gatherings were not possible, the project nevertheless held training events during the peak of the pandemic, observing health precautionary measures.

The project also started novel social media engagement activities, such as using a telegram group for dissemination of short videos taken by the community representatives to promote their work and allow technical exchanges. This approach will be further developed in the third year given its popularity within the community.

As mentioned in Section 3.4, the project is being implemented in close coordination with the Sra-aem commune council, the 4 village authorities and the local community who fully support this work. This has also attracted the interest of other communes in Choam Ksant district, which is a good indication that the project has managed to reach out to a wider community beyond the actual area of the project.

12. Darwin identity

As mentioned throughout this report, major efforts have been made to publicise this project, using a mix of conventional approaches (e.g. website presence, public outreach materials such as posters and leaflets) and innovative ways through social media (e.g. using a community Telegram group to promote agroforestry trials via video clips). The logo of the Darwin Initiative alongside the logos of the project partners appears on all materials, presentations, and in meetings, etc. related to the project **(e.g. Annexes 4.3; 4.4)**. Moreover, closer contacts were established with the UK representation in Phnom Penh as highlighted in Section 2.

13. Impact of COVID-19 on project delivery

Refer to related explanations in Sections 2, 3 and 11. In summary, the challenges faced as a result of the pandemic were very well managed by the project, with the Change Request system provided by the Darwin Initiative providing an excellent way to devise adaptive management.

14. Safeguarding

Please tick this box if any safeguarding or human rights violations have occurred during this financial year. ☐

If you have ticked the box, please ensure these are reported to ODA.safeguarding@defra.gov.uk as indicated in the T&Cs.

The conduct of BGCI staff and BGCI sub-contractors is guided by BGCI's Code of Conduct, which includes: Anti-bribery and corruption; Anti-harassment and bullying; Dignity at work; Anti-money laundering; Equality, diversity and inclusion; Safeguarding children, young persons and vulnerable adults; and Whistleblowing (https://www.bgci.org/legal-and-policies/).

BGCI staff and contractors must formally agree to conform to these policies by signing our standard contracts and grant agreements. Similarly, all partners of this project formally agree to adhere to BGCI's policies when signing project agreements.

All partners present reputable organisations with a track record in ensuring safeguarding policies are abided by. This is also monitored by the Project Steering Committee.

There were no safeguarding incidents or concerns in Year 2 of the project.

15. Project expenditure

Table 1: Project expenditure during the reporting period (1 April 2021 – 31 March 2022)

Project spend (indicative) si last Annual Report	2021/22 Grant (£)	2021/22 Total Darwin Costs (£)	Variance %	Comments (please exp significant variances)
Staff costs (see below)	[redacted]	[redacted]	[redacted]	[redacted] staff costs redeploye forest restoration (Opera Costs) (NAPV) Small staff and consultar cost used for travel (ICR/
Consultancy costs	[redacted]	[redacted]	[redacted]	Small staff and consulta cost used for travel (ICR/
Overhead Costs	[redacted]	[redacted]	[redacted]	
Travel and subsistence	[redacted]	[redacted]	[redacted]	Small staff and consultar cost used for travel (ICR/
Operating Costs	[redacted]	[redacted]	[redacted]	NAPV used for forest restoration
Capital items (see below)	[redacted]	[redacted]	[redacted]	
Monitoring & Evaluation (M&E)	[redacted]	[redacted]	[redacted]	
Others (see below)	[redacted]	[redacted]	[redacted]	
TOTAL	[redacted]	[redacted]		

16. OPTIONAL: Outstanding achievements of your project during the reporting period (300-400 words maximum). This section may be used for publicity purposes

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

The training workshop carried out by the project in Year 2 to promote agroforestry, is considered an outstanding achievement for during 2021-2022. The two-day workshop invited leaders from the 8 communes and key stakeholders involved in agriculture and environmental protection. On the first day, the participants visited agroforestry demonstration farms owned by farmers in Eco-village and Sra-aem Khang Cheung village. This provided excellent insights into the design types of agroforestry, and learn about the economic benefits being derived from farms managed through agroforestry. On the second day, technical sessions and the video displays provided an excellent opportunity for further technical exchanges amongst the participants and the project team. The participants were particulary impressed by the opportunities to diversify income generation, and high income generation from small agroforestry farms, in addition to better food safety and land use effectiveness.

The project also provided a manual on cultivation technique of fruit trees in Khmer translated from Vietnamese as well as a leaflet to guide agroforestry designs. The two documents provide a comprehensive resource to initiate agroforestry. Each commune received a copy of the manual and 50 copies of agroforestry guidance leaflet for further dissemination among their communities. In addition, the posters on project-related themes - value of the forest ecosystem, ecosystem and socio-economic impact of forest fire, planting trees in the villages and agroforestry models, present an excellent visual, public outreach resource.

As all of the communes are located in protected areas - Kulen Promtep Wildlife and Preah Roka Wildlife Sanctuary - where most of community members lack knowledge of cultivation through agroforestry and use land unsustainably, this workshop inspired the commune leaders, who have committed to further promote agroforestry with their communities.

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?	
Is the report less than 10MB? If so, please email to Darwin-Projects@ltsi.co.uk putting the project number in the Subject line.	
Is your report more than 10MB? If so, please discuss with Darwin-Projects@ltsi.co.uk about the best way to deliver the report, putting the project number in the Subject line.	
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.	
Do you have hard copies of material you need to submit with the report? If so, please make this clear in the covering email and ensure all material is marked with the project number. However, we would expect that most material will now be electronic.	
Have you involved your partners in preparation of the report and named the main contributors	
Have you completed the Project Expenditure table fully?	
Do not include claim forms or other communications with this report.	