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 2023

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

Darwin Initiative Project Information

Project reference	29-001
Project title	Embedding Sustainable Pollination Management into Nepalese Agricultural Systems
Country/ies	Nepal
Lead Partner	University of Bristol, UK
Project partner(s)	HERD International, Nepal, Local Initiatives for Biodiversity, Research and Development (LI-BIRD), Nepal Ministry of Land Management, Agriculture and Cooperatives (MoLMAC), Karnali Province Agriculture and Forest University (AFU), Nepal Central Department of Zoology, Tribhuvan University, Nepal UN Food and Agriculture Organisation (FAO) Nepal Nepal Agriculture Research Council (NARC) PACE, Nepal
Darwin Initiative grant value	£374,788
Start/end dates of project	Start date: 1st June 2022; End date: 30th November 2024
Reporting period (e.g. Apr 2022 – Mar 2023) and number (e.g. Annual Report 1, 2, 3)	June 2022 – March 2023 – Annual Report 1
Project Leader name	Professor Jane Memmott
Project website/blog/social media	https://libird.org/projects/pollination/ https://www.herdint.com/our-work/darwin/ https://www.facebook.com/groups/601083515388921
Report author(s) and date	Tom Timberlake, Sujan Sapkota, Shree Prasad Neupane, Deepak Joshi, Kedar Devkota & Jane Memmott – 26/04/2023

1. Project summary

Pollinators enhance the production of 75% of world crops, including many economically and nutritionally important fruits, vegetables, and seeds. Smallholder farmers in the developing world are disproportionately reliant on insect-pollinated crops for their livelihoods and for key dietary micronutrients such as vitamin A and folate. However, agricultural intensification, habitat loss and climate change are driving declines in pollinators worldwide, including in Nepal.

Little is known about the conservation status of individual pollinator species in Nepal, but rapid agricultural intensification and increasing pesticide use, combined with major crop yield losses from insufficient pollination, point towards widespread pollinator declines (Bhusal 2020). In addition to economic impacts, pollinator declines in Nepal are predicted to cause the loss of 26,000 years of healthy life each year as a result of malnutrition-related illnesses (Smith *et al.* 2015). It is very clear that if pollinator declines continue, levels of poverty and malnutrition in Nepal will worsen, further exacerbating the existing pressures on natural resources and biodiversity. Smallholder farmers in Nepal are often unaware of the importance of pollinators, but if provided with the knowledge needed for pollination management, they could increase their crop yields *and* simultaneously benefit biodiversity.

Our project is based in Karnali Province which is the largest and poorest province of Nepal, with only 23% of the population classified as food secure (UNDP 2020) and a high economic and nutritional reliance on pollinator-dependent crops (e.g., apples, beans and pumpkins). There is strong political will from the provincial and national-level government to promote biodiversity-friendly farming practices. However, various barriers including a lack of farmer awareness, a lack of capacity and limited evidence to inform policy, prevent this political will from translating into meaningful outputs for farmers on the ground.

Working with partners in Nepal and drawing on an evidence-base from our previous pollination project (2020-2022), this Darwin project will raise awareness of pollination, increase the capacity of individuals and institutions to research and manage pollination services, and facilitate the design of policies to conserve and enhance pollinator biodiversity in Nepal.

2. Project stakeholders/ partners

- The impetus for this project first came from project partner Dr Daya Ram Bhusal (Tribhuvan University, Nepal) who expressed a concern about pollinator declines in Nepal and a lack of any coordinated research and community/policy action to address it.
- In response, an interdisciplinary team of researchers, practitioners and development organisations was established and we collectively planned and wrote this project proposal.
- This process of collaborative planning, implementation and evaluation has continued throughout the project, facilitated by monthly team meetings and a recent team workshop in Pokhara, Nepal where each project partner presented their evaluation of the project so far and discussed ideas for the coming year.
- A particular strength of our team is its diversity, for example LI-BIRD provides agro-biodiversity expertise and is very well connected with agriculture and environmental policy makers; HERD provides public health, community engagement, and development expertise and has close relationships with health and development ministries; the universities provide technical ecological expertise and academic rigour whilst our partners at the ministry ensure that our project activities are mainstreamed at a provincial level. So far, the team dynamic has been excellent, and we have all formed valuable new connections and learnt from each other.
- Beyond the project team, we have identified, reached out to, and engaged with stakeholders at a local, district, and provincial level in Nepal through project inception workshops where we shared our project plans and requested feedback. We have subsequently incorporated this feedback into our project design (Annex 4a).
- To ensure clarity on the specific responsibilities of each partner and avoid overlap and duplication we held regular whole-team discussions (particularly in the beginning of the

project) in which each partner very clearly stated their expertise and vision for the project. Guided by this, we agreed upon a clear division of project activities to ensure successful project implementation.

3. Project progress

3.1 Progress in carrying out project Activities

All project activities scheduled for Year 1 have been completed and are outlined in detail below.

Output 1 (Pollinator awareness and stewardship program):

Following the recruitment of project field staff (5 women, 6 men) we conducted a 5-day Training of Trainers (ToT) course in Jumla (8-12 Sept 2022). This covered topics including pollinator biodiversity, drivers of decline, pollinator deficit information, impacts of climate change, pollination service management and the relevance of pollination to the food and nutritional security of smallholder farmers. Other major activities covered included education/outreach techniques and M&E requirements. All course content was detailed in a comprehensive ToT manual which was distributed to staff, and more widely (see Annex 4b).

Inception workshops were held at both the district and provincial level to get feedback and buy-in from local stakeholders, which was subsequently incorporated into project design (see Annex 4a).

Building on this feedback, an awareness class syllabus (see https://www.herdint.com/resources/introduction-to-pollination/) was co-designed by project staff and community farmers and field staff have subsequently delivered this course content to 4368 participants (71% women) in a total of 156 classes (Annex 4c). During these classes, a total of 1200 awareness leaflets have been distributed.

Three demonstration farms have been established (Annex 4d) to showcase pollinator friendly management practices of key crops, following the protocols outlined in the demonstration farm manual.

Following the establishment of these demonstration farms, we identified a group of 90 interested farmers (82% women) who have enrolled in our Farmer Field School (FFS) program and now attend fortnightly sessions on agroecological management practices, with a particular focus on pollination management. A total of 24 classes have been held so far, covering topics such as sustainable beekeeping, pollinator nesting site preparation, integrated pest management and apple tree pruning (see Annex 4e).

To enable us to monitor progress towards our project Outcomes, baseline surveys have been conducted to record: farmer's awareness of pollination and agrobiodiversity, baseline farming practices and crop yields, and plant & pollinator biodiversity (Annex 4f).

Our project team has recently established a Pollinator Facebook page to boost understanding and appreciation for pollinators and other biodiversity.

Output 2 (Pollinator capacity-building program):

A collaborative effort between all project partners enabled us to produce a comprehensive, locally-tailored pollination management handbook which has been translated into Nepalese and distributed to 46 stakeholders from 21 institutions by the end of Year 1. This professionally published 79-page handbook includes chapters on all aspects of pollination ecology and management, each of which has recommended lesson plans and teaching tips associated with it (Annex 4b).

A professionally produced pollinator education/promotion video for mass awareness amongst farmers and frontline extension workers is currently in-production and due to be released in Year 2.

According to our project timeline, two out of the seven capacity-building workshops have been completed; these have been attended 61 agriculture officers including some frontline extension workers (33% women) from 2 districts (Annex 4g).

Project partners from the Agriculture & Forestry University (AFU) have recruited and trained 10 students from the university to conduct pollinator surveys on 5 nutritionally and economically important but under-studied crops in Nepal: cardamon, coffee, citrus, mango and avocado (Annex 4h). Students are recording the key insect visitors to each crop and the degree of pollinator dependence and pollination deficits in each of the crops; this information will feed into the Digital Pollination Library (currently in development).

Output 3 (Pollinator Action Plan for Karnali province)

To initiate the process of formal engagement with project partners Ministry of Land Management, Agriculture and Cooperatives (MoLMAC), a memorandum of understanding (MOU) was signed between LI-BIRD and MoLMAC on 29/07/2022 (Annex 4i). MoLMAC has a mandate to formulate the provincial level policies and guidelines, and coordinates with municipal authorities in delivering the agricultural related strategies.

Following this, a 2-day provincial-level inception meeting and workshop was held on 4-5 Sept 2022 in the Karnali Province headquarters (Surkhet) chaired by MoLMAC and attended by 35 key stakeholders. The concept of a Pollinator Action Plan was initiated during the meeting and a Technical Working Group (TWG) of 14 stakeholder institutions was formed (Annex 4i).

A second round of Technical Working Group meetings were held in February 2023 to agree upon a clear set of priorities for the Pollinator Action Plan and devise an implementation timetable (Annex 4i).

3.2 Progress towards project Outputs

Output 1 (Pollinator awareness and stewardship program):

A total of 4368 farmers (71% women) attended one of our pollination awareness classes by the end of Year 1. This is a much higher number of participants than originally specified in the logframe (800 was the original target for year 1) and the reason for this is twofold: 1) during the inception workshops, local municipalities expressed strong interest in the project and requested that we try to reach ALL villages in the district so that no areas are overlooked – we decided to accommodate this request as it was still feasible within our budget; and 2) due to high levels of interest, participation has been greater than expected in each class (average of 28 participants per class). Feedback from the classes has been very positive, and awareness levels have increased from a baseline of only 6% of farmers being aware of pollination and knowing how to manage it, to 100% attendees having this knowledge (see Annex 4c and 06 for some pictures, statistics and quotes).

Alongside the pollinator awareness classes, we have held a total of 24 Farmer Field School (FFS) sessions, reaching a group of 90 lead farmers (82% women) who attend regular sessions. From a baseline of 18%, all 90 farmers (100%) now know how to construct and manage a beehive (82% increase), each of them constructing their own hive in the FFS program and placing it in their fields. Additionally, 100% of these farmers can now construct native pollinator nesting materials and can identify and cultivate the 10 best pollinator-friendly plants in this region (from a baseline of zero).

A total of 703 baseline farmer questionnaires have been completed to record baseline levels of ecological awareness, farming practices, crop yields and household nutrition (see summary results in Annex 4f); these surveys will be repeated after one year to record changes in each of these metrics and uptake of the pollinator stewardship scheme practices.

Whilst it is too early in the year to know whether the abundance and species richness of pollinating insects and wild plants have increased on demonstration farms (plants and pollinators only become active from April onwards), we recorded baseline levels of plant and pollinator diversity in a previous project (data in Annex 4f) and have established protocols and control/treatment monitoring plots which will enable us to measure changes in abundance and diversity in response to project activities.

We have recorded baseline yields of three key pollinator-dependent indicator crops (data in Annex 4f) and have established protocols and control/treatment monitoring plots to record changes in response to project activities.

The pollinator Facebook page has recently been established and currently has 47 members, 24 posts and 228 reactions. We have recently developed a social media strategy for the project which will be implemented over the coming month and is likely to greatly expand the membership and activity of the page.

Output 2 (Pollinator capacity-building program):

In Year 1 of the project (and in accordance with our logframe target), we conducted two capacity-building workshops reaching a total of 61 extension workers (33% women) in Surkhet and Dailekh districts. From a baseline of zero pollination management material in extension worker training programs, we provided comprehensive training in pollination ecology and management accompanied by a pollination management handbook (Annex 4b) which all participants said they would incorporate into their future extension work (this will be confirmed through follow-up surveys in 6 months' time).

The pollination management training materials produced through this project (Training of Trainer handbook) has been distributed to a total of 46 participants from 21 institutions including MoLMAC, Agriculture Development Directorate, Agriculture Knowledge Centre, Integrated Lab, Training Centre etc, Agriculture service centre of Municipalities and Rural Municipalities (Annex 4b). We will follow up with these individuals in 6 months to record how they have used the materials and how many additional people it has reached. These knowledge products will serve as the guiding document to learn and disseminate pollination related activities at a field level and we plan to continue their dissemination across every district and municipality of Karnali Province.

Most notably, we have produced these materials in collaboration with project partners MoLMAC which ensures local suitability and co-ownership. Key ministry civil servants including the head of agricultural training for the ministry have given their written assurance that these materials will be institutionalised and incorporated into future training schemes (Annex 4i) and we will continue to monitor this output.

In accordance with our implementation timeline, the pollinator awareness video and digital pollination library are both in development but have not been formally launched. Once they are launched, we will monitor their views and accesses through web analytics to assess their use.

Output 3 (Pollinator Action Plan for Karnali province)

Data analysis for the open access paper on economic & nutritional value of pollination in Nepal has been completed and manuscript writing has begun. We plan to submit the paper by October 2023 and will monitor its progress and access metrics as soon as it is published.

The province level sensitization and capacity building workshop was conducted in September, 2022, hosted by project partners from the ministry (MoLMAC) and attended by 35 key stakeholders from 14 different institutions (Annex 4i). The purpose of the workshop was to sensitise stakeholders to the importance of pollinators for biodiversity, human nutrition and livelihoods, and to launch the concept of a Pollinator Action Plan for Karnali Province.

Following on from this workshop, a Technical Working Group (TWG) was established to lead the development of the Pollinator Action Plan. So far, this TWG consists of 14 key members from various government, non-government and academic institutions, and more are likely to be invited (Annex 4i). During the first formal meeting of the TWG in February 2023, a set of key priorities were identified and agreed upon by all members (Annex 4i). Work is now underway on drafting the Pollinator Action Plan and this will be presented to the TWG in July 2023 for review and amendment. The permanent secretary of the province will remain updated on all of the actions and decisions of the TWG and he will ultimately present the pollinator strategy document to the cabinet for their approval and integration into their organic agriculture mission.

A signed MOU between LI-BIRD and MoLMAC (Annex 4i) and subsequent communication from the minister and permanent secretaries demonstrate commitment by the ministry to endorse the Pollinator Action Plan at a policy level once it is complete.

3.3 Progress towards the project Outcome

0.1 By the end of Year 1, a total of 4368 individuals (71% women) demonstrated increased ecological awareness and now understand what pollination is, why it is important, which insects are important and how to manage this service on their farms. A total of 703 baseline farmer questionnaires have been completed (approximately 4 from each awareness class) and we plan to follow up these farmers one year later and record their changes in farming practices and uptake rates of the Pollinator Stewardship Scheme.

0.2 Whilst it is too early in the year to know whether the abundance and species richness of pollinating insects and wild plants have increased on stewardship farms (plants and pollinators only become active from April onwards), we recorded baseline levels of plant and pollinator diversity in a previous project (data in Annex 4f) and have established protocols and control/treatment monitoring plots which will enable us to measure changes in abundance and diversity in response to project activities. Solitary bee nesting boxes have been established and will be monitored during the year to record occupation rates.

0.3 We have recorded baseline yields of three key pollinator-dependent indicator crops as well as household income from the sale of each of these crops (data in Annex 4f) and have established protocols and control/treatment monitoring plots to record changes in response to project activities. Follow-up farmer questionnaires will record changes in household income.

0.4 We have also conducted 703 baseline questionnaires to record baseline levels of household nutritional status and dietary intake of nutritious food groups (data in Annex 4f). We will follow up all of these participants after one year to record changes in their dietary diversity and intake of nutritious food groups.

0.5 A signed MOU between LI-BIRD and MoLMAC (Annex 4i) and a subsequent meeting of the Technical Working Group (TWG) highlights the commitment by the ministry to endorse the Pollinator Action Plan at a policy level once it is drafted and approved by the TWG. The first meeting of the TWG identified seven key priority areas for inclusion in the Pollinator Action Plan which are outlined in Annex 4i.

In addition to these outcomes already specified in the logframe, we have been asked by project partners MoLMAC to produce a pollination-focused Farmer Field School (FFS) syllabus which they will implement in other parts of the province using their own budget (see Annex 4e). This could give us one additional project outcome relating to enhanced pollinator awareness and management capacity amongst farmers at a whole-province level.

3.4 Monitoring of assumptions

Assumption: Farmers (especially women) have the authority, motivation, resources and information required to implement management changes.
Comments: Our experience has shown that farmers are very keen to attend our awareness classes and Farmer Field School sessions (evidenced by higher than expected participation, especially amongst women) and have expressed strong interest in replicating these activities on their own farms. We have increased farmer engagement by tailoring the classes to farmer feedback, for example including apple orchard management training in our sessions.

Assumption: Habitat management practices are effective at increasing pollinator abundance and diversity and farmer management actions have sufficient time to translate into a population-level effect on pollinators.
Comments: This assumption is still supported by evidence from other parts of the world which show population level responses to habitat management in the space of just 1-2 years (e.g., Carvell et al. 2016).

Assumption: Plant species which we are using as indicators of enhanced wild pollination services are present in/around all participating farms and benefit from cross pollination.
Comments: We have recorded at least 2 out of 3 indicator plants at all sites and their taxonomy predicts they have low self-compatibility and are therefore pollinator-dependent.

Assumption: Pollination deficits in crops and wild plants already exist in the region
Comments: Previous studies in Nepal and preliminary data from our study region strongly suggest this will be the case (Partap *et al.* 2012).

Assumption: Increased pollinator abundance leads to increased pollination services and resulting crop yields.
Comments: Whilst not yet tested in this region, it has been demonstrated many times in other parts of the world (e.g., Blaauw & Isaacs 2014)

Assumption: Additional produce from pollinator dependent crops is consumed or sold rather than given away.
Comments: Farmer questionnaire from our study region show that farmers intend to consume or sell any extra produce they get, rather than giving it away.

Assumption: Market price and consumer demand for pollinator-dependent crops remains stable throughout project lifespan.
Comments: Although impossible to predict future market activity, prices and demand have so far remained stable, with no indication that they are likely to change soon.

Assumption: Karnali Ministry of Land Management, Agriculture and Cooperatives remains committed to the promotion of biodiversity friendly farming practices.
Comments: Despite a change in minister since the project began, MoLMAC remains just as committed as ever to this cause, as evidenced by their enthusiastic participation in all project activities and their contributions to the Pollinator Action Plan.

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

Intended project impact: Pollinator conservation and management embedded into mainstream agricultural policy and practice in Nepal, with long term benefits for people and pollinators.

Our project has generated substantial dialogue on the importance of biodiversity and sustainable agriculture amongst numerous high-level policymakers, researchers and practitioners (see Annex 4i). New connections have been formed and new collaborations and project ideas are in-development, all of which are likely to contribute to long-term positive outcomes for biodiversity at a national-level. To quote the minister of Agriculture from Karnali Province, following our stakeholder workshop: *'Now I understand how insect diversity contributes agricultural production and human livelihoods'.* By raising pesticide regulations and promoting agroecological management practices at a provincial, and perhaps even national level, a wide range of biodiversity stands to benefit.

By engaging partners and stakeholders from the health and development sector, we have convinced them of the importance of pollination for human health and livelihoods. A recent peer-reviewed analysis from researchers at Harvard University showed that Nepal could increase its agricultural revenue by up to 30% if optimal pollination services were achieved across the country (Smith *et al*. 2022). Thus, by incorporating pollination management into agricultural policy and practice, our project will contribute towards achieving optimal crops yields, with associated benefits for human health and livelihoods.

4. Project support to the Conventions, Treaties or Agreements

Despite, their obvious relevance to Nepal's biodiversity and agriculture, pollinators and pollination are not explicitly mentioned anywhere in the NBSAP of Nepal (2014) or in its Agriculture Development Strategy. Our aim is to ensure that these topics are incorporated into Nepal's next revision of these strategies; this will help Nepal in meeting its commitment to the Convention on Biological Diversity (CBD), in particular Article 14/6 on: "The conservation and sustainable use of pollinators".

Moreover, by increasing the resilience of crop pollination services to climate change, we will contribute towards Nepal's Climate Adaptation Plan (Government of Nepal 2018).

We have made contact with the FAO's facilitator of the International Pollinator Initiative, Dr Abram Bicksler who has emphasised our project's alignment with the CBD (Annex 4j).

5. Project support to poverty reduction

Our project aims to contribute to poverty reduction amongst smallholder farming households in Jumla District, Nepal. We expect that household income from the sale of pollinator dependent cash crops (e.g., apples & beans) will increase 10% by project end, whilst the dietary diversity of these families will increase by 5%. We are measuring both of these indicators and will be able to report our progress towards them after this agricultural season (one year after the start of our project). Moreover, we have already greatly increased levels of biodiversity and nutritional knowledge amongst these farming households, empowering them to make their own agricultural and dietary decisions (see Annex 4c). Our team of 11 local field staff (all previously farmers from the local area) are already benefitting from greatly enhanced professional networks and skills, strengthening their future career prospects.

One of the most notable achievements of our project so far is to make 4386 people (71% women) aware of what pollinators are, why they are important and how to manage their services. This is expected to translate into improved pollination management and therefore increased crop yields and nutritional and economic outcomes amongst many of these people (monitoring in-progress).

6. Gender equality and social inclusion

Jumla district has high rates of seasonal out-migration of many men in search of jobs, and thus women have an important role in agricultural activities. Moreover, they stand to lose the most income if pollinators decline. Women in this region also face substantial challenges in obtaining, articulating, and acting upon agricultural knowledge, which both disadvantages them and their families and threatens the success of sustainable development initiatives. For this reason, we have particularly targeted women farmers throughout all of our awareness programs (71% women), Farmer Field Schools sessions (82% women) and Capacity-Building Classes (33% women which is higher than their current representation), to ensure they are the main recipients of our work. Five out of 11 of our field staff are women which is substantially higher than the proportion of women who applied for the role. Throughout all of our activities we aim to equip women with valuable knowledge and skills and empower them to make their own agriculture decisions.

Please quantify the proportion of women on the Project Board[1].	30%
Please quantify the proportion of project partners that are led by women, or which	20%

[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.

have a senior leadership team consisting of at least 50% women[2].	

7. Monitoring and evaluation

The project's M&E system is designed to provide the necessary data and information to measure progress against achieving the project outputs and outcomes and to make informed decisions about ongoing project activities. We are using both qualitative methods (e.g., focused group discussion, participant feedback, email communication and case studies) and quantitative methods (e.g., farmer questionnaires, biodiversity surveys, crop yield measurements) to collect this information. A gender disaggregated database of project activities, beneficiaries, outputs and outcomes is maintained and updated on a regular basis which provides important information to analyse and report against progress indicators.

Monthly whole-team meetings provide us with an opportunity to monitor the progress and success of each project activity and assess their contribution towards each output and outcome. Additionally, a two-day whole-team workshop was held in Nepal 9 months after project inception (April 2023) to critically evaluate the Activity>Output>Outcome pathway and adapt activities as required.

Although the project leader, Jane Memmott is ultimately responsible for the M&E process, each implementation partner is responsible for feeding in quantitative and qualitative data from their respective project Output and this is monitored and evaluated as a whole-team.

We have made two changes to our M&E plan since the project proposal was written:

1) We have reduced the number of monitoring farm sites from 100 to 30 as we realised that it would not be possible to conduct high quality biodiversity surveys and crop yield measurements at so many sites. Instead, we have focused on monitoring each of these 30 sites in more detail so that we can collect data on multiple metrics (e.g., insect pan traps, flowering plant surveys, pollinator scan sampling, wild plant seed set and crop yield), allowing us to build up a better picture of the outcome of our interventions. The farmer questionnaires nevertheless remain as widespread as we originally planned.

2) We have decided to collect all of our quantitative monitoring data (including activity reporting, farmer questionnaires, biodiversity surveys etc.) on tablets using Open Data Kit and immediately upload it to a secure central project server. This ensures a high level of data security, minimal transcription error or language barrier issues, and enables us to evaluate progress and view key statistics such as number of beneficiaries and geographic project reach in real-time.

8. Lessons learnt

Some important lessons we have learnt during Year 1 of the project are:

- It is essential to very clearly delineate the role and responsibilities of each project partner so that there is no overlap in activities and no budgetary confusion. Our team is a mix of existing partners from a previous project and new partners who have come on-board, so it was essential to understand each other's strengths and weaknesses and invest time in generating team cohesion and establishing clear roles. An in-person group workshop was an excellent way to cement the team together.
- One challenge we have had is a few of our field staff leaving their posts for personal reasons, or to pursue further study. This initially created some disruption to project activities, but we have now learnt to build in more overlap and collaboration between field staff roles so that if any future staff leave, others are immediately able to fill the gap whilst a replacement is found and trained.

[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.

- Working in a relatively remote and deprived region, we have learnt that the expectations of the community need to be very carefully managed. There is often a perception that development projects will deliver material resources or immediate monetary benefits, so we learnt to be very clear in all stakeholder engagement workshops and community mobilisation sessions that we are NOT distributing resources but are instead sharing new knowledge. Once this was realised, it was accepted and farmers are still very interested to be engaged, but it was essential to establish this fact early on.
- One of major challenges with our awareness classes was the realisation that it was very difficult to generate interest or engagement in pollination when most people don't know what pollination is. Therefore, we broadened the scope of our awareness classes to also include apple orchard management practices which we have expertise in, and farmers are very eager to learn (it is the most important cash crop in this region). This served as a useful hook for increasing engagement in our activities and has the added benefit of improving broader farming practices.
- We have learnt that in order to influence policy and get our recommendations integrated into provincial strategy documents, it is essential to build close relationships with ministry officials and understand their needs and agendas. For this reason, our team has invested a lot of time in communicating with provincial officials and has ensured that we involve them closely in all activities. For example, they are co-authors of our Pollination Training Manual which has resulted in greater ownership of the material and the commitment to incorporate it into their training programs.

Overall, our advice to future projects would be: 1) to understand and build cohesion within your team as early as possible; 2) to carefully manage community and stakeholder expectations; 3) to invest time in understanding the needs of the community and other stakeholders and find ways to accommodate at least some of these needs in order to strengthen trust and engagement.

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

NA – this is our first annual report.

10. Risk Management

No new risks have arisen since the last revision of the risk register 6 months ago. We have attached an up-to-date version of the risk register with this report.

11. Other comments on progress not covered elsewhere

Project coordinator Tom Timberlake has secured an additional £18,409 of funding through a Bristol University Policy Support Award to enhance the policy change component of the Darwin Initiative project. This award includes funding for extra policy training and extra staff time to allocate to policy engagement activities.

12. Sustainability and legacy

Our project has been designed to ensure long-term sustainability through three main strategies:

1) PARTNERSHIP –project partners are developing strong institutional capacity in pollinator conservation and management and have already begun to integrate these approaches into their ongoing work and future project planning.

2) MAINSTREAMING – comprehensive pollination training, information and awareness materials have been produced in the Nepalese language and distributed widely (Annexes 4b & 4k). These are the first such materials produced in the Nepalese language, so they are likely to leave a long-term legacy in Nepal. Already, we have received requests from government institutions including the Agriculture Knowledge Centre (AKC), Agriculture Development

Directorate and Ministry Training Centre to include this material into their regular programs. Additionally, we have received commitment from our ministry partners that they will endorse the recommendations of our Pollinator Action Plan at a policy level, ensuring long-term impact.

3) SCALABILITY – all project materials and recommendations are designed with scaling in mind and our project partners are already considering a subsequent project proposal which would scale our activities and outcomes to a national or even regional level, ideally resulting in a National Pollinator Strategy for Nepal.

Overall, the feedback we have received multiple times from ministry officials, researchers and community stakeholder is that *'there is no other project like this – this is the first time we have thought about the importance of pollination and realised how much it can benefit agricultural productivity.'.* This kind of feedback demonstrates the legacy we are creating in Nepal and convinces us that our project impact will continue after the project end.

13. Darwin Initiative identity

All of our project awareness and information materials have clearly acknowledged the UK Darwin Initiative – these include workshop banners, training manuals, awareness leaflets, results posters, an awareness video and project t-shirts (Annex 4b & 4k).

Additionally, our project Facebook page and websites clearly link to the Darwin Initiative and all project tweets have used the @UKBCFs handle as well as the Darwin Initiative hashtag, where relevant.

Although this Darwin Initiative (DI) project builds upon the findings of a previous 3-year research project in Nepal, it is a separate project with a distinct identity – a fact which is reflected in all materials and events. The project websites are solely dedicated to the DI project and the project is referred to by partners ad stakeholders as '*The Darwin Initiative Pollination Project'*.

The Darwin Initiative is already relatively well recognised within Nepal and indeed project partners LI-BIRD had previously led a DI project. Many of our other stakeholders however have learned about the DI program for the first time through our project.

14. Safeguarding

Has your Safeguarding Policy been updated in the past 12 months?		No
Have any concerns been investigated in the past 12 months		No
Does your project have a Safeguarding focal point?	Yes – Ramesh Pathak [redacted]	
Has the focal point attended any formal training in the last 12 months?	Yes - in July 2022	
What proportion (and number) of project staff have received formal training on Safeguarding?		Past: 76% [16 people] Planned: 10% [2 people]
Has there been any lessons learnt or challenges on Safeguarding in the past 12 months? Please ensure no sensitive data is included within responses. Whilst working with communities and local field staff at our remote project site, we have had to be very mindful of the power-imbalance between local and national-level staff. Initially this can ead to a reluctance by local staff to speak up and speak out and make their opinions heard. We have overcome this by creating an open and safe forum for staff to voice their views and ensuring that these are taken seriously so that trust and confidence is established.		

To ensure that staff and community members feel comfortable reporting any safeguarding ssues, we have allocated a safeguarding contact person who is external to the immediate project team and can anonymously report any safeguarding issues, should they occur.
Does the project have any developments or activities planned around Safeguarding in the coming 12 months? If so please specify. Yes, a new staff member will be appointed in 1 month and they will attend a formal Safeguarding training as part of their induction. Additionally, a safeguarding focal person from HERD International will hold a monitoring visit to the implementation site and interact with all staffs and selected community stakeholders to understand the process and to ensure the safeguarding policy is adhered to.

15. Project expenditure

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

Project spend (indicative) since last Annual Report	2022/23 Grant (£)	2022/23 Total Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)	[redacted]			
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items (see below)				
Monitoring & Evaluation (M&E)				
Others (see below)				
TOTAL	**£108,020.4**	**£102,806.6**		

***Please Note that M&E costs were not a separate budget line in our original application – they are covered under other headings such as 'Operating Costs' and 'Travel & Subsistence'. We have reported them here, but not included them in the total cost as this would be double accounting.*

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

	Matched funding secured to date	Total matched funding expected by end of project

Matched funding leveraged by the partners to deliver the project.	[redacted]
Total additional finance mobilised by new activities building on evidence, best practices and project (£)	

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

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

In Year 1 of the Darwin Initiative Pollination Project, we have made significant progress towards embedding pollinator conservation and management into Nepalese agricultural policy and practice. For many stakeholders – including over 4000 farmers (71% women) and a range of ministry officials, we have introduced them to the concept of pollination for the very first time and convinced them that this is something worth promoting. A group of 90 core farmers have attended a regular Farmer Field School program on pollination management and are now integrating these practices into their own farming activities, the results of which we will closely monitor. Meanwhile, at the provincial level, we have provided intensive training and guidance documents to 61 agricultural extension workers who will incorporate these approaches into their ongoing work. The minister for agriculture in Karnali Province, as well as the permanent secretaries for agriculture and the environment have attended two pollination workshops delivered by our team and have declared their commitment to incorporating our project materials and recommendations into provincial policy and training programs. Overall, we have substantially raised the profile of pollination in Nepal and created a network of researchers, organisations and policymakers who are eager to take forward our ideas and incorporate them into mainstream policy, research and development work in Nepal. Increased pollinator diversity and resulting crop yields will ultimately lead to improved biodiversity as well as human health and livelihood outcomes in Nepal, helping the country to meet its commitments to the Convention on Biological Diversity and the UN Sustainable Development Goals.

Image, Video or Graphic Information:

File Type (Image / Video / Graphic)	File Name or File Location	Caption, country and credit	Online accounts to be tagged (leave blank if none)	Consent of subjects received (delete as necessary)
Image	Awareness class	Project staff member delivering a pollination awareness class to farmers in a rural mountain village in Jumla District, Nepal. Credit: Sujan Sapkota	@BristolBioSci @TomTimberlake92 @HERDIntl	Yes
Image	Farmer inspecting apple blossom	Apple farmer inspecting the pollinators visiting his crop flowers in Huri village of Jumla District	@BristolBioSci @TomTimberlake92 @HERDIntl	Yes

		Nepal. Credit: Tom Timberlake		
Image	Apple pollinator_hoverfly	A hoverfly pollinator visiting an apple flower in Jumla District, Nepal. Credit: Daya Ram Bhusal	@BristolBioSci @TomTimberlake92 @HERDIntl	Yes

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

Project summary	SMART Indicators	Progress and Achievements April 2022 - March 2023	Actions required/planned for next period
Impact Pollinator conservation and management embedded into mainstream agricultural policy and practice in Nepal, with long term benefits for people and pollinators		Already we have seen a substantial increase in biodiversity awareness in our project area and a commitment by provincial policymakers to incorporate pollinator conservation & management into their policy strategies. This should ultimately lead to increased pollinator biodiversity and crop yields in Nepal, resulting in positive outcomes for biodiversity, human health and livelihoods.	
Outcome: Widespread uptake of an evidence-based strategy for enhancing pollination services in Karnali Province Nepal, leading to increased pollinator biodiversity, increased yields of pollinator dependent crops and improved livelihoods and nutrition	0.1 Increased ecological awareness and resulting uptake of the Pollinator Stewardship Scheme (reduced pesticide use, wildflower margin plantings, nesting resource provision, habitat preservation & increased crop diversity) by 1000 farmers (at least 40% women) in Jumla District by project end.	0.1 Increased pollinator awareness and management capacity by 4368 farmers (71% women).	0.1 Record changes in management practices & longer-term knowledge retention.
	0.2 Abundance and species richness of pollinating insects (solitary bees, social bees, flies, butterflies, wasps, beetles, and moths) on participating stewardship farms increases 15% by project end relative to baseline, whilst reproductive success of Himalayan alpine shrub and meadow flora increases 10% on participating farms (sample = 20 participating & 20 control farms).	0.2 Baseline data collected (Annex 4f) and quantitative monitoring protocols, as well as control/treatment monitoring sites established.	0.2 Record changes in plant & pollinator biodiversity on control and treatment farms.

	0.3 Yield of pollinator-dependent crops on participating stewardship farms increases 10% by project end relative to baseline, translating into 10% increase in household income from sale of pollinator dependent cash crops (sample = 50 participating and 50 control farms). Data from similar work in this region suggests this increase is realistic (Devkota et al. 2021).	0.3 Baseline data on crops yields and household income collected and monitoring protocols and sites established.	0.3 Record changes in crop yield and household income in control and treatment sites.
	0.4 Dietary diversity index and vitamin A & folate intake of women (who are the most vulnerable adults) on participating farms increases 5% relative to baseline (sample = 50 participating and 50 control farms). Data from ongoing project shows current diet diversity is extremely low thus scale of change is realistic.	0.4 Baseline data on dietary diversity collected and monitoring protocols as well as study population established.	0.4 Record changes in dietary diversity amongst study population.
	0.5 Strategies to promote pollinator conservation and management (e.g., pesticide regulation, pollination training and research capacity) integrated into provincial policy by project end.	0.5 Commitment by project partners in the provincial ministry to endorse the recommendations of the Pollinator Action Plan at a policy level and incorporate training materials into agricultural programs (Annex 4i).	0.5 Draft the Pollinator Action Plan with ministry officials for review, amendment and ultimate endorsement. Monitor the uptake of new policies and training materials in provincial programs.
Output 1. Pollinator awareness and stewardship program in Jumla district to increase public understanding of pollination services and demonstrate evidence-based pollination-management practices	1.1 By project end, 3000 participants (50% women) attend a pollinator awareness class (800 in Y1, 1200 in Y2 & 1000 in Y3) and 500 farmers (>30% women) attend a Farmer Field School session on the demonstration farms. Following classes, 80% of attendees can explain value of pollination services to livelihoods & nutrition, list key pollinator-dependent crops, identify major pollinator groups and specify ways to support pollinators and improve their nutrition.	1.1 4368 farmers (71% women) have attended an awareness class and 90 farmers (82% women) have attended regular FFS sessions and are now implementing some of the practices on their own farms. All participants now know what pollination is, why it is relevant to them, which insects are most important, and how they can manage pollination services.	

	1.2 By project end, abundance and species richness of pollinating insects (solitary bees, social bees, flies, butterflies, wasps, beetles, and moths) and wild plant species on demonstration farms increases 20% (c.8% each year), relative to baseline, demonstrating biodiversity value of stewardship scheme to stakeholders.	1.2 We have not yet reached the main field season when crops are flowering and pollinators are active, but the indicators remain appropriate, and we have finalised all monitoring protocols and control/treatment sites.	
	1.3. By project end, yields of pollinator-dependent crops on demonstration farms increase by 15% (5% each year) relative to baseline. Nutritional value of pollinated vs unpollinated crops increases 5%, demonstrating pollination value to stakeholders.	1.3 We have not yet reached the main field season when crops are harvested, but the indicators remain appropriate and we have finalised all monitoring protocols and control/treatment sites, as well as collecting necessary baseline data (Annex 4f).	
	1.4 2000 pollinator-related images and artworks submitted to the project Facebook group by at least 500 different people in Karnali by project end.	The Facebook page has only been recently established but more than 50 images have already been submitted and the membership is growing (currently 41 members). We have established a social media strategy which we expect to substantially increase our following and activity over the coming year.	
Activities:		**Progress so far:**	**Plans for next project period:**
1.1 Recruit field staff and conduct a five-day Training of Trainer (ToT) course for all project staff on agroecosystem services, pollinator biodiversity and management, ecological data collection, teaching methods etc.		1.1 Completed	
1.2 Devise an evidence-based Pollinator Stewardship Scheme for Jumla District, based on data from ongoing pollination project in Jumla. Produce and distribute 3000 booklets outlining the Stewardship Scheme.		1.2 Stewardship Scheme completed and a total of 1200 information leaflets so far distributed.	1.2 Continue distributing leaflets and monitor uptake of stewardship scheme
1.3 Stakeholder engagement workshops to get buy-in and strategic feedback at start and end of project.		1.3 Stakeholder inception workshops held at provincial, district and municipality level.	1.3 Keep stakeholders updated and engaged in our project activities.

1.4 Establish three demonstration farms showcasing the evidence-based Pollinator Stewardship Scheme through cultivation of high-value pollinator-dependent crops. Establish pollinator friendly habitat and management practices on the farms.		1.4 All 3 demonstration farms established and pollinator management practices initiated.	1.4 Continue expanding the pollinator-friendly management and monitor the outcomes.
1.5 Run pollinator education/awareness/training classes for a total of 3000 participants from across Jumla District. Promote the Pollinator Stewardship Scheme in these classes and advertise Farmer Field School sessions (see next activity).		1.5 A total of 156 awareness classes completed, attended by 4368 participants (71% women).	1.5. Continue running awareness classes to reach new areas and monitor the uptake of our recommendations through follow-up questionnaires.
1.6 Run weekly Farmer Field School (FFS) style sessions on demonstration farms to showcase and experiment with pollination management practices and traditional beekeeping.		1.6 A total of 24 FFS sessions completed and attended by a consistent group of 90 farmers (82% women)	1.6 Continue running FFS sessions and monitor uptake and outcomes of the methods.
1.7 Establish a Pollinator Facebook group for Karnali Province to boost understanding and appreciation for pollinators and other biodiversity. Members encouraged to share pollinator pictures, pollinator-themed art and we will share conservation/management tips.		1.7 Facebook group established with 47 members.	1.7 Implement our social media strategy to expand the group and reach new members.
1.8 Conduct baseline and follow-up surveys of farms participating in the Pollinator Stewardship Scheme and matched control farms, recording biodiversity and livelihood outcomes. Data used for M&E purposes and published as open-access paper.		1.8 Baseline surveys completed. Monitoring protocols and control/treatments established.	1.8 Start the monitoring surveys in April 2023 and continue throughout the season.
1.9 Conduct follow-up surveys of 10% of farmers attending the awareness courses/Farmer Field School sessions (c.200 total) to record rates of Pollinator Stewardship Scheme uptake.		1.9 703 baseline farmer questionnaires completed (approximately 10% of all participants)	1.9 Conduct follow-up surveys of these same farmers to record rates of stewardship scheme uptake.
1.10 Nutritional analysis (lab test) of control and treatment crop samples to assess the nutritional value of pollinator-enhanced and unpollinated fruits/vegetables – to be used as a project indicator.		1.10 Not yet completed	1.10 Due to be completed this year
Output 2. Pollinator capacity-building program to equip individuals and institutions with the knowledge, resources and tools to identify,	2.1 By project end, 175 extension workers, researchers and trainers (50	**<u>Progress towards each indicator:</u>**	

research and manage crop pollinators, enabling them to train and advise others.	in Y1, 100 in Y2 & 25 in Y3; >30% women) from across 10 districts of Karnali Province have the expertise & resources to identify & monitor key crop pollinators and advise on crop pollination management.	2.1 A total of 61 extension workers (33% women) have attended a capacity building course and now have the expertise and information resources to implement pollination management training.	
	2.2 Course content from pollinator training package incorporated into training programme & course syllabus of 20 schools, colleges & NGOs working on agriculture & biodiversity in Karnali, reaching 3,000 farmers/ students by end of project.	2.2 Pollination training materials distributed to a total of 46 people from 21 institutions. We will monitor the use and uptake of these materials over the coming year, as well as continuing to distribute them widely.	
	2.3 Pollinator awareness video uploaded to YouTube by end of 2023 and viewed 3000 times by project end.	2.3 Awareness video in-production, but yet to be released	
	2.4 Online digital crop pollination library (with taxonomic guide) established by end of 2023 and accessed by at least 500 individuals by end of project.	2.4 Digital Library in development with much of the content already generated. It is on schedule to be completed by the end of Project Year 2	
	2.5 Pollination management practices incorporated into standard issue training manual for new extension workers in Karnali province by project end.	2.5 Provincial Agriculture Training Centre and head of Agriculture Knowledge Centre (AKC) have requested to integrate our pollination training materials into their course content which trains extension workers. We will continue to monitor this uptake.	
Activities:		**Progress so far:**	**Plans for next project period:**
2.1 Produce handbook for managing crop pollination services in Nepal, including information on pollinator dependent crops, key pollinators and pollination management guidance. Distribute to researchers and extension workers across Karnali Province.		2.1 Handbook completed and available here. Already distributed to 46 stakeholders.	2.1 Continue distributing this resource and monitor its use and uptake.

2.2 Produce a pollinator education/promotion video for mass awareness amongst farmers and frontline extension workers and for use in the pollinator awareness classes.		2.2 Video in production	2.2 Complete and publicise the video
2.3 Deliver seven capacity-building workshops across Karnali Province, enabling participants (extension workers, researchers etc.) to identify, research & monitor key crop pollinators and advise on their management.		2.3 Two capacity building workshops so far delivered	2.3 Deliver 4 more workshops in Year 2
2.4 Produce and distribute a generic pollinator training package (including lesson plans, pollinator management handbook, outreach materials and video) to 200 institutions in Karnali Province.		2.4 Training resources so far distributed to 21 institutions	2.4 Continue distributing resources and monitor their use and uptake
2.5 Train and employ masters' students from Agriculture and Forestry University (AFU) to photograph and database pollinator specimens and conduct short periods of fieldwork to fill in gaps crop pollination knowledge, for the Digital Pollination Library (see Activity 2.6)		2.5 Ten students already recruited and trained and fieldwork is underway on 5 crops (Annex 4h)	2.5 Continue the work in Year 2 and complete surveys of 3 more crops.
2.6 Establish a Digital Pollination Library for Nepal, with details of each crop's pollinator-dependence, its nutritional and economic value, its key pollinators (along with a taxonomic identification resource for each one), and guidance for enhancing its pollination.		2.6 Still in development	2.6 Aim to publish by end of project Year 2, or soon after
2.7 Organize a travelling seminar for provincial and district level stakeholders to achieve wider dissemination of project activities & visit the pollinator-friendly demonstration farms to showcase the Pollinator Stewardship Scheme.		2.7 In planning phase	2.7 Yet to be completed
Output 3. Pollinator Action Plan for Karnali province to embed pollinator conservation & management into provincial policy, advocating this as a blueprint for a National Pollinator Strategy for Nepal	3.1 Open access paper on economic & nutritional value of pollination in Nepal published by end of 2023 & accessed by 500 people by project end.	3.1 Paper analysis completed and manuscript writing underway. Submission is likely by October 2023	
	3.2 Workshop in 2023 co-hosted by partners from Ministry of Land Management, Agriculture and Cooperatives (MoLMAC), Karnali and attended by 25 high-level provincial-level stakeholders. Key pollinator	3.2 Workshop completed and attended by 27 high-level stakeholders. Technical Working Group established and key priorities for the Pollinator Action Plan agreed upon (Annex 4i).	

	conservation strategies identified & agreed upon.		
	3.3 Publication of policy-prescriptive Pollinator Action Plan for Karnali Province by end of 2023. Document viewed by 300 key provincial and federal-level stakeholders including policymakers, researchers and practitioners by project end.	3.3 Draft Pollinator Action Plan due to be presented to Technical Working Group (including key ministry officials) for review in July 2023.	
	3.4 National-level workshop in 2024 attended by 50 high-level stakeholders. Attendees are receptive to the concept of a National Pollinator Strategy and take actions to promote it.	3.4 Yet to be completed	
Activities:		**Progress so far:**	**Plans for next project period:**
3.1 Publish a team-authored, open-access paper quantifying the economic and nutritional value of pollination services in Nepal, providing an evidence base for the value of pollinators to human health and livelihoods.		3.1. Analysis completed and writing underway	3.1 Proposed submission date: October 2023
3.2 Form a project steering committee chaired by Secretory of Karnali Ministry of Land Management, Agriculture and Cooperative (MoLMAC) Establish a technical working group to bring policy level officers on-board for drafting the Pollinator Action Plan.		3.2 Technical Working Group established with 14 members. Two meetings already held	3.2 Next meeting in July 2023 when draft Action Plan will be presented
3.3 Hold a 2-day provincial-level workshop of experts and stakeholders led by the technical working group to identify policy solutions for conserving and enhancing pollination services.		3.3 Completed	NA
3.4 Draft Pollinator Action Plan and circulate amongst participants for comment.		3.4 Yet to be completed	3.4 Due to be presented to Technical Working Group in July 2023
3.5 Publish a policy-prescriptive Pollinator Action Plan for Karnali Province drawing on workshop outputs and the evidence base from our ongoing project in Nepal. Promote widespread uptake through advocacy work.		3.5 Yet to be completed	3.5 Planned for Year 3

3.6 Hold a 2-day national-level pollination workshop in Kathmandu to propose the concept of a National Pollinator Action Plan for Nepal, using the Karnali Pollinator Action Plan as a flagship/blueprint example.	3.6 Yet to be completed	3.6 Planned for Year 3
3.7 Publish the national level workshop proceedings, highlighting key policy solutions and action-points for ongoing activities, following project end. Circulate proceedings amongst workshop attendees for feedback.	3.7 Yet to be completed	3.7 Planned for Year 3

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: Pollinator conservation and management embedded into mainstream agricultural policy and practice in Nepal, with long term benefits for people and pollinators (Max 30 words)			
Outcome: (Max 30 words) Widespread uptake of an evidence-based strategy for enhancing pollination services in Karnali Province Nepal, leading to increased pollinator biodiversity, increased yields of pollinator dependent crops and improved livelihoods and nutrition	0.1 Increased ecological awareness and resulting uptake of the Pollinator Stewardship Scheme (reduced pesticide use, wildflower margin plantings, nesting resource provision, habitat preservation & increased crop diversity) by 1000 farmers (at least 40% women) in Jumla District by project end. 0.2 Abundance and species richness of pollinating insects (solitary bees, social bees, flies, butterflies, wasps, beetles, and moths) on participating stewardship farms increases 15% by project end relative to baseline, whilst reproductive success of Himalayan alpine shrub and meadow flora increases 10% on participating farms (sample = 20 participating & 20 control farms). 0.3 Yield of pollinator-dependent crops on participating stewardship farms increases 10% by project end relative to baseline, translating into 10% increase in household income from sale of pollinator dependent cash crops (sample = 50 participating and 50 control farms). Data from similar work in this region	0.1 Follow-up surveys of 10% of farmer course attendees (c.200 total) to record evidence of Pollinator Stewardship Scheme uptake. 0.2a Annual pollinator surveys carried out in fixed survey plots using tried-and-tested pollinator survey app customised for this region under existing project. 0.2b Solitary bee nest box occupation rate 0.2c Annual census of seed set in three Himalayan alpine wild plant indicator species (*Rosa sericea, Berberis aristata, Spiraea canescens*) 0.3 Annual farmer questionnaires to record quantity of produce sold and price obtained for each pollinator-dependent crop.	Farmers (especially women) have the authority, motivation, resources and information required to implement management changes. We aim to remove as many of these barriers as possible. Farmer management actions have sufficient time to translate into a population-level effect on pollinators Habitat management practices are effective at increasing pollinator abundance and diversity – demonstrated in other parts of the world (e.g., Blaauw & Isaacs 2014) Plant indicator species are present in/around all participating farms and benefit from cross pollination (highly prevalent species, whose taxonomy predicts they have low self-compatibility were selected) Pollination deficits in crops and wild plants already exist in the region - suggested by available data (Partap *et al.* 2012) Increased pollinator abundance leads to increased pollination services and resulting crop yields.

	suggests this increase is realistic (Devkota *et al*. 2021). 0.4 Dietary diversity index and vitamin A & folate intake of women (who are the most vulnerable adults) on participating farms increases 5% relative to baseline (sample = 50 participating and 50 control farms). Data from ongoing project shows current diet diversity is extremely low thus scale of change is realistic. 0.5 Strategies to promote pollinator conservation and management (e.g., pesticide regulation, pollination training and research capacity) integrated into provincial policy by project end.	0.4 Annual dietary recall surveys to record food intake. This information can be used to calculate a dietary diversity index and estimate vitamin A and folate intake. 0.5a Presence of new policies in provincial policy document and with associated budget. 0.5b Provincial government training course schedule for new extension workers	Additional produce from pollinator dependent crops is consumed or sold (suggested by high demand for many of these crops e.g., apples & beans) rather than given away or fed to animals. Market price and consumer demand for pollinator-dependent crops remains stable throughout project lifespan. Karnali Ministry of Land Management, Agriculture and Cooperatives remains committed to the promotion of biodiversity friendly farming practices (see letter of support)
Outputs: **1**. **Pollinator awareness and stewardship program** in Jumla district to increase public understanding of pollination services and demonstrate evidence-based pollination-management practices	1.1 By project end, 3000 participants (50% women) attend a pollinator awareness class (800 in Y1, 1200 in Y2 & 1000 in Y3) and 500 farmers (>30% women) attend a Farmer Field School session on the demonstration farms. Following classes, 80% of attendees can explain value of pollination services to livelihoods & nutrition, list key pollinator-dependent crops, identify major pollinator groups and specify ways to support pollinators and improve their nutrition.	1.1a Attendance certificates & annual project reports 1.1b Quiz-style survey at end of each outreach session (different versions available to suit range of ages & literacy levels) to test understanding. Baseline data on levels of pollinator awareness has already been collected.	Farmers and other stakeholders have the time and motivation to engage in outreach and training sessions (non-monetary incentives provided) District officials continue to support the project and grant permission to conduct outreach classes. Participants are engaged in the classes & understand course content (level will be tailored to group ability).

	1.2 By project end, abundance and species richness of pollinating insects (solitary bees, social bees, flies, butterflies, wasps, beetles, and moths) and wild plant species on demonstration farms increases 20% (c.8% each year), relative to baseline, demonstrating biodiversity value of stewardship scheme to stakeholders. 1.3. By project end, yields of pollinator-dependent crops on demonstration farms increase by 15% (5% each year) relative to baseline. Nutritional value of pollinated vs unpollinated crops increases 5%, demonstrating pollination value to stakeholders. 1.4 2000 pollinator-related images and artworks submitted to the project Facebook group by at least 500 different people in Karnali by project end.	1.2 Quarterly plant and pollinator surveys carried out in fixed survey plots using tried-and-tested pollinator survey app customised for this region under existing project. 1.3a Pollinator exclusion experiments (following standardised FAO protocol) to quantify additional crop yield derived from pollination services. 1.3b Laboratory-based nutritional analysis of pollinator-enhanced crops. 1.4 Facebook metrics	Habitat management practices are effective at increasing pollinator abundance and diversity – demonstrated in many other parts of the world (Blaauw & Isaacs 2014; Carvell *et al.* 2017) Crop pollination deficits already exist in this region - suggested by available data (Partap *et al.* 2012) Nutritional quality of crop produce is increased by cross pollination – previously shown by Brittain *et al.* (2014) Substantial numbers of people in Karnali Province have Facebook accounts and access to internet (project partners have confirmed this).
2. **Pollinator capacity-building program** to equip individuals and institutions with the knowledge, resources and tools to identify, research and manage crop pollinators, enabling them to train and advise others.	2.1 By project end, 175 extension workers, researchers and trainers (50 in Y1, 100 in Y2 & 25 in Y3; >30% women) from across 10 districts of Karnali Province have the expertise & resources to identify & monitor key crop pollinators and advise on crop pollination management. 2.2 Course content from pollinator training package incorporated into	2.1a End of course field and desk-based assessment to test levels of understanding and proficiency. 2.1b Follow-up surveys to offer further support and record attendees' ongoing use of the course materials. 2.2a Course syllabus documents written and published.	At least 80% of all agricultural extension workers in Karnali Province are given permission to attend training courses. Course attendees are engaged in the classes, understand their content and can access/use the internet on a phone or computer Individuals/institutions have the time, resources, and motivation to

	training programme & course syllabus of 20 schools, colleges & NGOs working on agriculture & biodiversity in Karnali, reaching 3,000 farmers/ students by end of project. 2.3 Pollinator awareness video uploaded to YouTube by end of 2023 and viewed 3000 times by project end. 2.4 Online digital crop pollination library (with taxonomic guide) established by end of 2023 and accessed by at least 500 individuals by end of project. 2.5 Pollination management practices incorporated into standard issue training manual for new extension workers in Karnali province by project end.	2.2b Student/farmer attendance records from participating organisations/individuals 2.3 YouTube metrics 2.4 Existence of pollination website and Google analytics to record website views 2.5 Published extension worker training manual	implement the training package and deliver it to their target communities Researchers, practitioners and policy-makers are aware of the digital pollination library and have the incentive to use it; promotional activities will be used to increase its visibility. The Karnali Ministry of Land Management, Agriculture and Cooperatives remains committed to the promotion of biodiversity friendly farming practices
3. **Pollinator Action Plan for Karnali province** to embed pollinator conservation & management into provincial policy, advocating this as a blueprint for a National Pollinator Strategy for Nepal	3.1 Open access paper on economic & nutritional value of pollination in Nepal published by end of 2023 & accessed by 500 people by project end. 3.2 Workshop in 2023 co-hosted by partners from Ministry of Land Management, Agriculture and Cooperatives (MoLMAC), Karnali and attended by 25 high-level provincial-level stakeholders. Key pollinator conservation strategies identified & agreed upon.	3.1 ResearchGate and publisher metrics, including AltMetric. 3.2a Published workshop proceedings. 3.2b Social media posts	Collaborators from Nepal remain willing to participate as co-authors and share data (this is currently the case) Ministry of Land Management, Agriculture and Cooperatives (MoLMAC), Karnali Province remains committed to the promotion of biodiversity friendly farming practices.

	3.3 Publication of policy-prescriptive Pollinator Action Plan for Karnali Province by end of 2023. Document viewed by 300 key provincial and federal-level stakeholders including policymakers, researchers and practitioners by project end. 3.4 National-level workshop in 2024 attended by 50 high-level stakeholders. Attendees are receptive to the concept of a National Pollinator Strategy and take actions to promote it.	3.3a Presence of action plan on Ministry of Land Management, Agriculture and Cooperatives website. 3.3b Google analytics and results of pop-up survey on website 3.4a Published workshop proceedings including stakeholder comments 3.4b Downloads of workshop proceedings	Stakeholders reach agreement on most important pollinator conservation actions. Pollinator Action Plan is widely distributed and publicised by project partners and MoLMAC National government upholds its CBD commitment to promoting sustainable farming practices. Key stakeholders are motivated to attend

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)
Note that our Activity numbering below does not relate to the numbering of Output Indicators above
OUTPUT 1:
1.1 Recruit field staff and conduct a five-day Training of Trainer (ToT) course for all project staff on agroecosystem services, pollinator biodiversity and management, ecological data collection, teaching methods etc.

1.2 Devise an evidence-based Pollinator Stewardship Scheme for Jumla District, based on data from ongoing pollination project in Jumla. Produce and distribute 3000 booklets outlining the Stewardship Scheme.

1.3 Stakeholder engagement workshops to get buy-in and strategic feedback at start and end of project.

1.4 Establish three demonstration farms showcasing the evidence-based Pollinator Stewardship Scheme through cultivation of high-value pollinator-dependent crops. Establish pollinator friendly habitat and management practices on the farms.

1.5 Run pollinator education/awareness/training classes for a total of 3000 participants from across Jumla District. Promote the Pollinator Stewardship Scheme in these classes and advertise Farmer Field School sessions (see next activity).

1.6 Run weekly Farmer Field School (FFS) style sessions on demonstration farms to showcase and experiment with pollination management practices and traditional beekeeping.

1.7 Establish a Pollinator Facebook group for Karnali Province to boost understanding and appreciation for pollinators and other biodiversity. Members encouraged to share pollinator pictures, pollinator-themed art and we will share conservation/management tips.

1.8 Conduct baseline and follow-up surveys of farms participating in the Pollinator Stewardship Scheme and matched control farms, recording biodiversity and livelihood outcomes. Data used for M&E purposes and published as open-access paper.

1.9 Conduct follow-up surveys of 10% of farmers attending the awareness courses/Farmer Field School sessions (c.200 total) to record rates of Pollinator Stewardship Scheme uptake.

1.10 Nutritional analysis (lab test) of control and treatment crop samples to assess the nutritional value of pollinator-enhanced and unpollinated fruits/vegetables – to be used as a project indicator.

OUTPUT 2:

2.1 Produce handbook for managing crop pollination services in Nepal, including information on pollinator dependent crops, key pollinators and pollination management guidance. Distribute to researchers and extension workers across Karnali Province.

2.2 Produce a pollinator education/promotion video for mass awareness amongst farmers and frontline extension workers and for use in the pollinator awareness classes.

2.3 Deliver seven capacity-building workshops across Karnali Province, enabling participants (extension workers, researchers etc.) to identify, research & monitor key crop pollinators and advise on their management.

2.4 Produce and distribute a generic pollinator training package (including lesson plans, pollinator management handbook, outreach materials and video) to 200 institutions in Karnali Province.

2.5 Train and employ masters' students from Agriculture and Forestry University (AFU) to photograph and database pollinator specimens and conduct short periods of fieldwork to fill in gaps crop pollination knowledge, for the Digital Pollination Library (see Activity 2.6)

2.6 Establish a Digital Pollination Library for Nepal, with details of each crop's pollinator-dependence, its nutritional and economic value, its key pollinators (along with a taxonomic identification resource for each one), and guidance for enhancing its pollination.

2.7 Organize a travelling seminar for provincial and district level stakeholders to achieve wider dissemination of project activities & visit the pollinator-friendly demonstration farms to showcase the Pollinator Stewardship Scheme.

OUTPUT 3:

3.1 Publish a team-authored, open-access paper quantifying the economic and nutritional value of pollination services in Nepal, providing an evidence base for the value of pollinators to human health and livelihoods.

3.2 Form a project steering committee chaired by Secretory of Karnali Ministry of Land Management, Agriculture and Cooperative (MoLMAC) Establish a technical working group to bring policy level officers on-board for drafting the Pollinator Action Plan.

3.3 Hold a 2-day provincial-level workshop of experts and stakeholders led by the technical working group to identify policy solutions for conserving and enhancing pollination services.

3.4 Draft Pollinator Action Plan and circulate amongst participants for comment.

3.5 Publish a policy-prescriptive Pollinator Action Plan for Karnali Province drawing on workshop outputs and the evidence base from our ongoing project in Nepal. Promote widespread uptake through advocacy work.

3.6 Hold a 2-day national-level pollination workshop in Kathmandu to propose the concept of a National Pollinator Action Plan for Nepal, using the Karnali Pollinator Action Plan as a flagship/blueprint example.

3.7 Publish the national level workshop proceedings, highlighting key policy solutions and action-points for ongoing activities, following project end. Circulate proceedings amongst workshop attendees for feedback.

Annex 3: Standard Indicators

Table 1 Project Standard Indicators

DI Indicator number	Name of indicator using original wording	Name of Indicator after adjusting wording to align with DI Standard Indicators	Units	Disaggregation	Year 1 Total	Year 2 Total	Year 3 Total	Total to date	Total planned during the project
DI-A01	Number of people from key national and local stakeholders completing structured and relevant training	Number of people trained in sustainable pollination management practices to enhance crop yields & conserve biodiversity	individuals	Male: 28% Female: 72% Smallholder farmers: 98% Extension workers: 2% Training typology: biodiversity & sustainable agriculture	4530			4530	10,000
DI-A03	Number of local/national organisations with improved capability and capacity as a result of project.	Number of organisations attending a pollination training workshop or capacity-building course who now have information resources and capacity to deliver training themselves.	organisations	Organisation type: National NGOs: 3 Universities: 2 Provincial government: 2 Local governments: 11 Industry/business: 3	21			21	200
DI-A07	Number of government institutions/departments with enhanced awareness and understanding of biodiversity and associated poverty issues	Number of government institutions with enhanced awareness of the value of pollinator biodiversity and its links to human health and livelihoods	institutions	Govt. Organisation Type: Provincial government: 3 Local government: 11 Health sector: 7% Environment: 7%	14			14	50

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
				Agriculture: 86%					
DI-C01	Number of best practice guides and knowledge products published and endorsed	Number of pollinator awareness, management and training documents produced and endorsed by the provincial ministry.	number	Knowledge area: Agroecological awareness and management Product typology: x1 Training of Trainer manual, x1 Farmer Field School syllabus, x1 Awareness leaflet x4 posters	7			7	12
DI-C14	Number of decision-makers attending briefing events.	Number of policymakers attending pollination & human nutrition briefing events	number	Gender: (F:20, M: 41) Types of decision-makers: National NGOs: 9 Universities: 5 Provincial government: 18 Local governments: 23 Industry/business : 6 Number of events: 3	61			61	175
DI-B04	Number of new/improved sustainable livelihoods/ poverty reduction management plans available and endorsed	Number of policy strategies relating to agroecological management, human nutrition and	number	Languages: English & Nepali	0			0	2

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
		sustainable livelihoods available and endorsed		Typology of plans: Pollinator Action Plan Jumla Nutrition Plan?					

Table 2 Publications

Title	Type (e.g. journals, manual, CDs)	Detail (authors, year)	Gender of Lead Author	Nationality of Lead Author	Publishers (name, city)	Available from (e.g. weblink or publisher if not available online)
* Understanding and Managing Pollination Services in Nepal.	Training of Trainer Manual	Neupane S.P., T. Timberlake, K. Devkota, S. Sapkota, D. Bhusal, C.B. Rokaya, T. Devkota, A. Bhusal, N. Pudasaini, S. GC & J. Memmott. (2023)	Male	Nepalese	LI-BIRD, Pokhara	https://libird.org/pollination-manual
* Pollinator Awareness Leaflet	Awareness Leaflet	S. Sapkota, K. Devkota, T. Timberlake, D. Joshi & J. Memmott. (2023)	Male	Nepalese	HERD, Kathmandu	https://www.herdint.com/resources/introduction-to-pollination/
* Pollination and Nutrition Awareness poster series	Poster	S. Sapkota, K. Devkota, T. Timberlake, D. Joshi, N. Saville & J. Memmott. (2023)	Male	Nepalese	HERD, Kathmandu	https://www.herdint.com/resources/iec-materials-on-pollination-and-its-management-strategies/

Checklist for submission

	Check
Different reporting templates have different questions, and it is important you use the correct one. Have you checked you have used the **correct template** (checking fund, type of report (i.e. Annual or Final), and year) and **deleted the blue guidance text** before submission?	Yes
Is the report less than 10MB? If so, please email to BCF-Reports@niras.com putting the project number in the Subject line.	Yes
Is your report more than 10MB? If so, please discuss with BCF-Reports@niras.com about the best way to deliver the report, putting the project number in the Subject line.	No
Have you included means of verification? You should not submit every project document, but the main outputs and a selection of the others would strengthen the report.	Yes
Do you have hard copies of material you need to submit with the report? If so, please make this clear in the covering email and ensure all material is marked with the project number. However, we would expect that most material will now be electronic.	No
If you are submitting photos for publicity purposes, do these meet the outlined requirements (see section 16)?	Yes
Have you involved your partners in preparation of the report and named the main contributors	Yes
Have you completed the Project Expenditure table fully?	Yes
Do not include claim forms or other communications with this report.	