

Darwin Initiative Capability & Capacity Annual Report

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

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

Submission Deadline: 30th April 2023

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

Darwin Initiative Project Information

Project reference	DARCC014
Project title	Enhancing the capacity and capability of orchid conservation in Armenia
Country/ies	Armenia
Lead Partner	RBG Kew
Project partner(s)	Nature Heritage NGO
Darwin Initiative grant value	£131,418
Start/end dates of project	1 st April 2022 to 31 st March 2024
Reporting period (e.g. Apr 2022 – Mar 2023) and number (e.g. Annual Report 1, 2, 3)	1 st April 2022 to 31 st March 2023
Project Leader name	Dr Aisyah Faruk
Project website/blog/social media	https://www.kew.org/science/our-science/projects/saving-armenias-orchids ; @AisyahFaruk
Report author(s) and date	Dr Aisyah Faruk; Dr Astghik Papikyan; Dr Anush Nersesyan; 30 th April 2023

1. Project summary

The urgency of protecting our world’s biodiversity is now becoming apparent, with an estimated 39% of all vascular plants threatened with extinction. A cost-effective way of conserving plants is through long-term seed banking; however, some species have seeds that are unsuitable for conventional seed banking techniques. These are known as “exceptional species”, which include orchids, therefore the approach to conserve orchids requires an integration of in situ and ex situ conservation methods. Alongside the practical difficulties in conserving orchids, the trade of orchid tubers in the Central Asian region has raised concerns over its effects on wild populations. The collection and use of orchids in Armenia are undocumented, further threatening local populations from illegal collections that can contribute towards species loss, as seen in neighbouring countries (e.g., Turkey and Iran). Armenia currently lacks an ex-situ strategy for orchids due to limitations in the capability and capacity to store and duplicate seeds of “exceptional species”.

The project aims to enhance the conservation of temperate, terrestrial orchids and their associated habitats in the Caucasus Biodiversity Hotspot through increasing the capability and capacity of local communities, civil institutions, and NGOs in Armenia to identify and conserve orchids in situ and ex situ. The project team will work closely with the Yenokavan community

(see Figure 1), situated within a high orchid diversity area situated within an area of high orchid diversity and increasing encroachment from farming and eco-tourism activities.

In situ conservation

The in-situ aspect of the project involves:

- 1) Raising awareness of orchid collecting and trade, and national and international legislation (e.g. CITES) via an in-country training workshop with members from the Armenian Ministry of Environment and the Institute of Botany of Armenia;
- 2) Enhancing the capability of in-country NGO on conducting community engagement for conservation through training and continued supervision;
- 3) Build empowerment towards rural communities through participatory mapping of key resources used by the communities and identifying mutually beneficial conservation management at the landscape level, indirectly contributing towards poverty alleviation through ensuring important areas for local livelihoods are not impacted by land-use planning;
- 4) Engagement of a local MSc student to enhance knowledge of orchid habitat quality, distribution, and population size, thereby simultaneously supporting biodiversity conservation and contribute towards increasing opportunity for potential employment at a higher salary; and
- 5) Sharing of project learning through a networking workshop, giving an opportunity for stakeholders to feedback proposed conservation strategies and discuss outcomes for local community. The results will also be reported to the CITES Authority in Armenia and the UK's CITES team.

Ex situ conservation

The ex-situ aspect of the project involves the following:

- 1) Ensuring the first viable seed collection of native Armenian orchids in cold storage in-country and at the Millennium Seed Bank through training of staff from the National Seed Bank and procurement of equipment for collecting, cleaning, drying and storing orchid seeds;
- 2) Development of a working protocol for temperate, terrestrial orchids of the Caucasus via storage experiments;
- 3) Global dissemination of project learning and outputs to an international seed banking community via the Millennium Seed Bank Partnership newsletter (e.g. Samara) and training programmes.

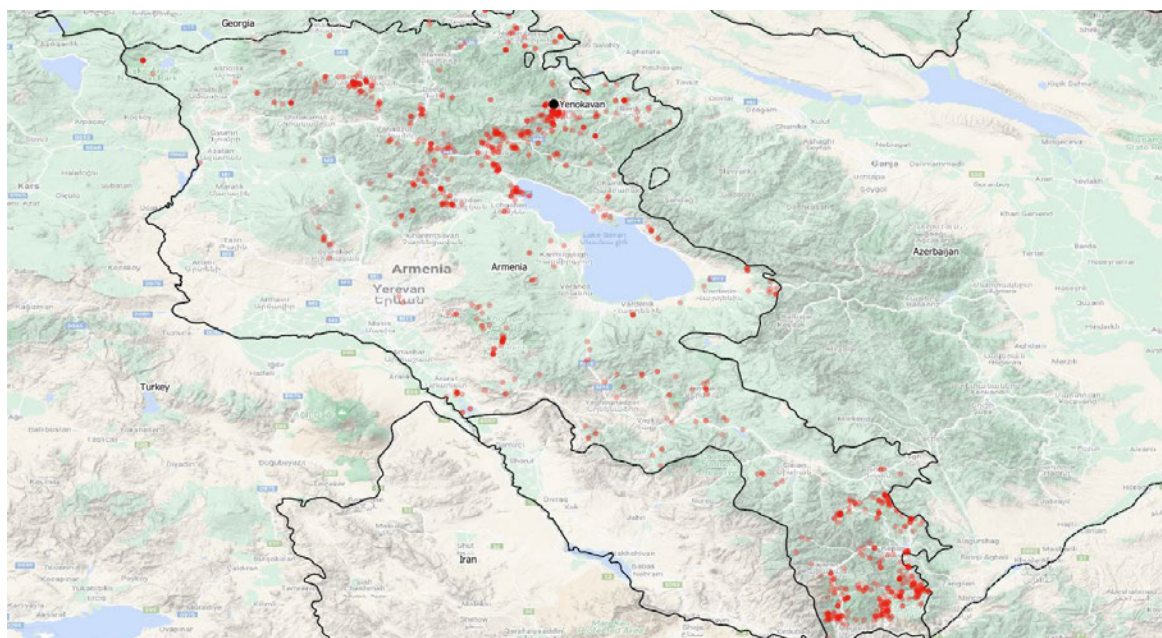


Figure 1 Map of the orchid localities (red dots) and target community (black dot) to the north of Armenia
Darwin Initiative C&C: Annual Report Template 2023

2. Project stakeholders/ partners

All formal partners and key stakeholders are actively engaged with the project. The in-country lead, Nature Heritage NGO members have been instrumental at developing the ongoing community engagement activities in Yenokavan and surveying orchid localities in collaboration with the Institute of Botany Herbarium (ERE <https://sweetgum.nybg.org/science/ih/herbarium-details/?irn=124850>). In-country partners have led on the choice of target community, based on their extensive knowledge of the current threats and challenges of the area. Similarly, in-country partners determined the selection of orchid species for both the seed conservation and MSc student research aspects of the project. Technical specialist based at the Institute of Botany and the National Seed Bank are actively engaged in providing access to key herbarium material to identify orchid populations and processing seeds post-collecting. Technical staff have also given their time for training sessions.

3. Project progress

3.1 Progress in carrying out project Activities

Output 1 Enhanced capability of local stakeholders within the Yenokavan community to protect orchid diversity in situ.

Activities:

1.1 Challenges and perspectives to orchid conservation training taking place in Yerevan in July 2022

Project PI and a member of the RBG Kew Policy and CITES department travelled to Yerevan in July 2022. During this trip, a training course led by the CITES team member was held, attended by 15 participants from the local botanical institution, 87% of whom were women, NGO staff and the department for environment of the Armenian government. This exceeded the target number of participants within the original log-frame (target: 10 people) and proportion of women represented (target: ~60%). A translation was provided throughout the training to make the material accessible to all participants. It was the first ever CITES course held in Armenia.

CITES Training Workshop – Ecoepicenter, A. Takhtajyan Institute of Botany, Armenia, 25 July 2022

N	Name, Surname	Organization	E-mail
1	<u>Alvard Aslanyan</u>	Ministry of Environment	Alva_aslanyan@mail.ru
2	Karen Hovhannisyan	Ministry of Environment	karen.hovhannisyan@env.am
3	<u>Nelli Muradyan</u>	Institute of Botany of NAS RA	nelly.muradyan12@gmail.com
4	<u>Manik Grigoryan</u>	Institute of Botany of NAS RA	Manikgrigoryan89@gmail.com
5	Anna Asatryan	Institute of Botany of NAS RA	A.asatryan@botany.am
6	<u>Alexandr Rudov</u>	Institute of Botany of NAS RA	atyalakal@gmail.com
7	<u>Gayane Nokoghosyan</u>	Ministry of Environment	g.nokoghosyan@mail.ru
8	<u>Hripsik Qosyan</u>	Institute of Botany of NAS RA	hripsik1998@gmail.com
9	Ashkhen Danielyan	Institute of Botany of NAS RA	ashkhen.danielyan.95@mail.ru
10	<u>Yevgenia Navasardyan</u>	Institute of Botany of NAS RA	y.navasardyan@mail.ru
11	<u>Gayane Shaboyan</u>	Institute of Botany of NAS RA	gayaneshaboyan@mail.ru
12	Sona Galstyan	Institute of Botany of NAS RA	galstyans@ymail.com
13	Astghik Papikyan	Institute of Botany of NAS RA	papikyanastghik@gmail.com
14	Anush Nersesyan	Institute of Botany of NAS RA	annersesyan1@gmail.com
15	Narine Hayrapetyan	Institute of Botany of NAS RA	narine.hayrapetyan@gmail.com
16			

Figure 2: Attendance register for the CITES training workshop in Yerevan



Figure 3: Representative of RBG Kew’s Policy Team leading the CITES training.

1.2 Recruitment and training of MSc student by partner institution on orchid identification and habitat assessment

Project partners have recruited an MSc student from the Armenian State Pedagogical University After Khachatur Abovyan. Syuzi Karapetyan (Figure 4) is currently supervised by Mrs Ruzan Simonyan from university and in-country collaborator Dr Anush Nersesyan (see Annex 4.1 and 4.2 for signed contract and translation between institutions). Ms Karapetyan has spent the last year working closely with the in-country team to familiarise herself with orchid identification. She has completed her literature review and will be focusing on three main orchid genera known to occur in the Tavush region, where the Yenokavan community is situated. In the coming months, she will be working in the herbarium of the Institute of Botany in Armenia, studying the taxonomy, distribution and identifying the habitats of nine species (*Cephalanthera damasonium* (Mill.) Druce; *C. longifolia* (L.) Fritsch; *C. rubra* (L.) Rich.; *Limodorum abortivum* (L.) Sw.; *Orchis coriophora* L.; *O. mascula* (L.) L.; *O. punctulata* Steven ex Lindl; *O. purpurea* Huds.; *Neotinea tridentata* (Scop.) R.M.Bateman, Pridgeon & M.W.Chase). Field excursion to verify populations of the nine species is planned at the beginning of May.



Figure 4: Photo of Ms Syuzi Karapetyan.

1.3 Best-practice on semi-structured interviews and community participatory mapping developed.

During the visit in July, project PI conducted a 1-day lecture introducing the in-country team on the theory and methods of participatory mapping. This has been supported through consultation by Dr Matthew Davies from the University of Cambridge prior to the meeting in July. Since then, the UK and Armenian project teams have been developing the first questionnaires and flyers that will be used during first official engagement and survey with the Yenokavan community.

The in-country teams will conduct door-to-door interviews during the times where agricultural activities are low (see 1.4), ensuring a maximum number of residents are free to take part. General introductions and Prior Informed Consent will be sought before asking the questions to gather general socio-demographic info and current baseline knowledge of conservation and orchid use around the area (Figure 5). As part of the questionnaire, the team will ask community members to identify if native orchids are found where they live/work using photos (Figure 6), their willingness to be part of the participatory mapping and best day/time to reach them. Photos of orchids not native to Armenia is also included, to enable us to give an indication of the level of accuracy for different individuals. Flyers of the project and knowledge about native orchids will then be distributed to the members to encourage community members to spread the word to others in the community (Figure 7).

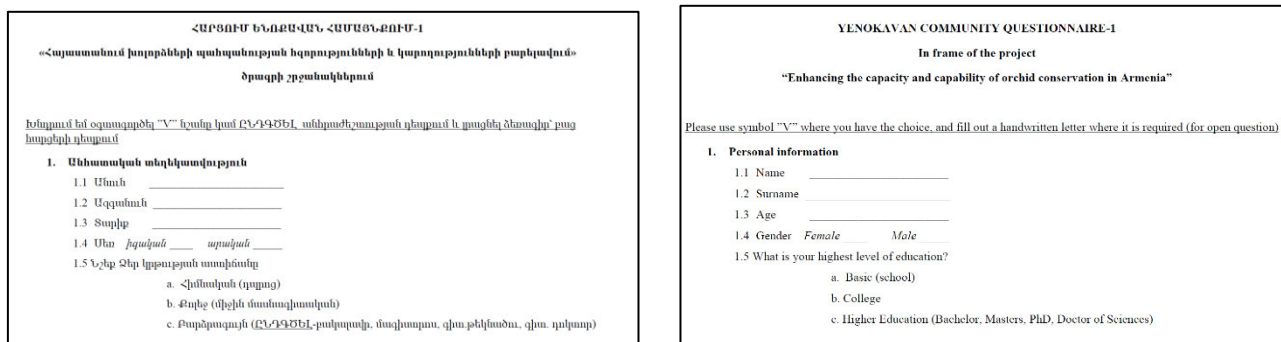


Figure 5: Screenshot of semi-structured questionnaire (Annex 4.3 & Annex 4.4 for full versions).



Figure 6: Photos of native and non-native orchids.

1.4 Partners and MSc student engage with and conduct semi-structure interviews.

One-hundred and twenty flyers in Armenian (plus 30 in English), and 100 semi-structure questionnaires have been printed ready for the community visit (Figure 7). The in-country team aimed to conduct the community interviews in the end of March, however, the head of the community advised to delay the survey until the end of April. March to April is the height of agricultural activities for the community and as Yenokavan is made up of many farming families, the delay would benefit the project greatly as it will allow the team to interview more of the community. A focus group will also be convened during the same trip, who will be formally introduced to the project by the Nature Heritage team.

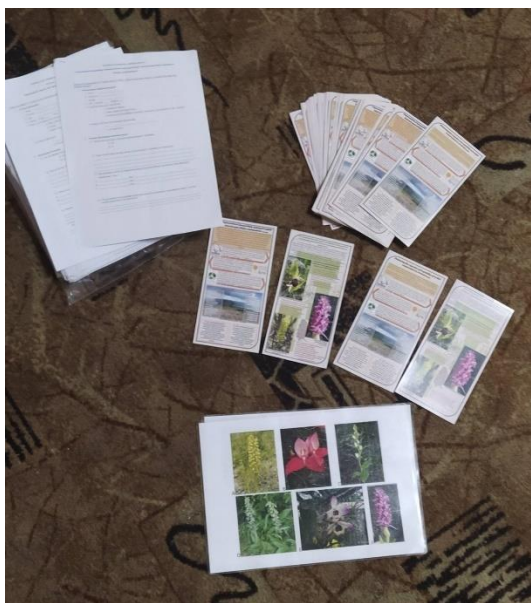


Figure 7: Material printed and ready for community surveys.

Activity 1.5 to 1.9 relates to Year 2.

Output 2 In-country Armenian institution have the capacity and capability to conserve native orchid species ex situ and able to duplicate to the MSB cryopreservation unit

2.1 Two Armenian seed bank team travel to MSB for 2-week training attachment programme.

In January 2023, Dr Anush Nersesyan travelled to the UK to attend the “Exceptional Species Technical Attachment Course” at the Millennium Seed Bank. Unfortunately, Ms Ashken Danielyan, who was also meant to attend the same training, did not receive her UK travel visa, and therefore unable to come for the training this year, but received training in-country (see 2.2).

The training was well received by all the participants. Trainees were shown how to collect orchids at the right stage of seed pod maturity from members of the UK team, had training on the best techniques for cleaning delicate seeds and spores by the Microseed Collection Team of the MSB and attended a guest talk from Dustin Wolkis of the National Tropical Botanical Garden from Hawai'i focused on different types of exceptional species and the strategies for their conservation. The training course also allowed the participants to share their backgrounds and research interests, as well as a chance to network with each other and continue to build their knowledge-base past the end of the course.



Figure 8: Dr Anush Nersesyan from Nature Heritage NGO preparing to give a presentation about orchids in Armenia to the Technical Attachment group.



Figure 9: Dr Dani Ballesteros, Honorary Research Associate of RBG Kew, teaching Dr Nersesyan how to excise embryos of chestnuts ready for cryopreservation.

2.2 Delivery of in-country training on orchid ex situ conservation.

In July, project PI travelled to the National Seed Bank of Armenia to conduct in-country training on ex situ conservation. Prior to this, the in-country team also conducted an introductory session with the seed bank group to introduce the project and discuss potential challenges (Figure 10; Annex 4.5).

Figure 10: Introduction meeting with team from National Seed Bank of Armenia



Figure 11: UK and Armenian project team members collecting orchid seeds in Dilijan, north of Lake Sevan



Figure 12: Project-PI showing the Armenian seed banking team how to clean and dry orchid seeds.

2.3 Procurement of equipment for collecting, cleaning and banking.

Main items for collecting, cleaning, and storing orchid seeds have been procured by the project team. Laptops, fine mesh sieves, field camera and -20 °C freezer were purchased in-country (Figure 13). Hiking boots and -80 °C freezer was purchased in the UK and shipped to Armenia.



Figure 13: -20 °C (left) and -80°C (right) freezers now at the National Seed Bank of Armenia. Although many orchids are able to be stored in -20°C, others lose viability quickly, and may require ultracool conditions (e.g. -80°C).

2.4 Locality survey of orchid populations for seed collection activity.

Surveys were conducted by the in-country team in the Spring of 2022 to locate populations of orchids for the seed collecting expeditions later in the year (see Activity 2.5). As many orchids have similar looking seed pods at the point of dispersal, recording the locality and population size of orchids when in flower was essential to ensure the correct species is collected later.

2.5 Seeds, herbarium, and data of 10 orchid species collected from multiple populations.

The first field collecting expedition was done in July 2022 during the PI's visit to Armenia. A total of 8 collections of 6 species were collected from three provinces (Aragatsotn, Gegharkunik, and Tavush). Herbarium specimens were also collected for correct identification along with data associated with each collection. A number of the populations were still found with unripe pods (e.g. *Dactylorhiza urvilleana* and *Epipactis helleborine*). These were still collected and ripened in the seed bank (see 2.6). In August, the in-country team made another collecting expedition to Gegharkunik and Tavush to collect another 4 collections of 4 species. In total, the project has seen the collection of 8 species from 12 populations (80% of overall species target; 60% of overall collection target).

2.6 Seeds are cleaned, dried and pre-storage viability determined in Armenia.

The 12 collections made by the project team were brought to the National Seed Bank of Armenia for processing. Unripe pods were placed in a ripening chamber set up during the PI's visit to Yerevan (Figure 14). Pre-storage viability is determined using fluorescent staining technique. Seeds were stained in-country, however, due to difficulties in obtaining

a fluorescent microscope in Yerevan, the slides with stained seeds were brought to the MSB for counting.

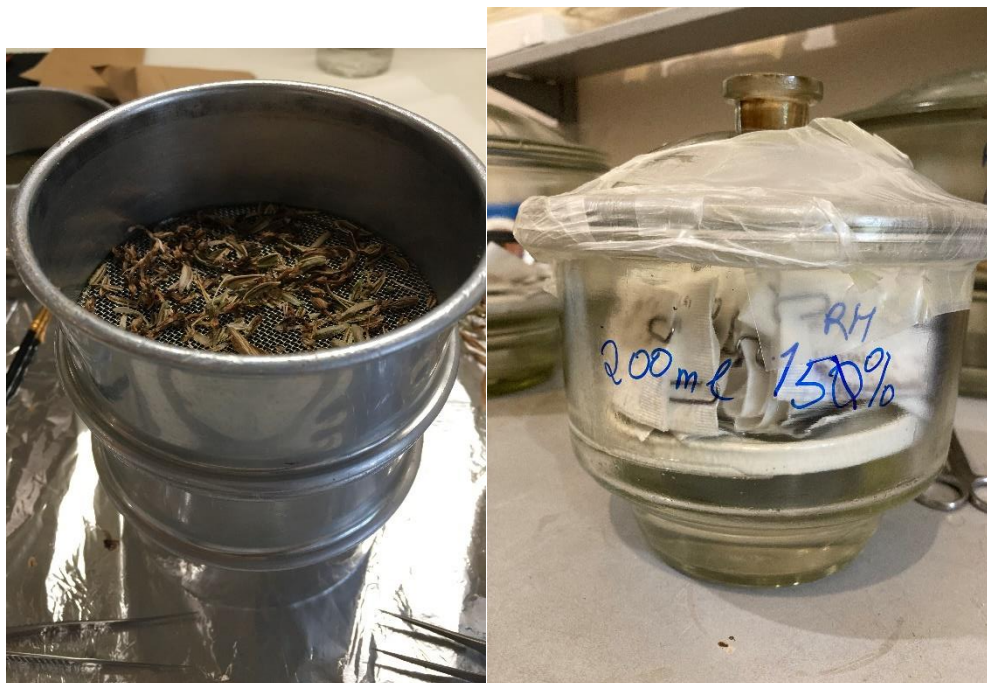


Figure 14: Seeds extracted from ripened pods using graduated sieves (left), after which seeds are then placed in drying chambers with differing solutions of Lithium Chloride (LiCl) to create specific relative humidity.

2.7 Seeds are stored in -20 degrees Celsius and -80 degrees Celsius in-country.

This activity is completed for the 12 collections in Year 1. Each collection was split after cleaning, dried to 15% eRH, 30% eRH or 50% eRH for ~48 hours for seeds to equilibrate. Once dried, seeds were placed in a -20C freezer and -80 freezer, both situated within the National Seed Bank of Armenia.

2.8 Subset of seeds are sent to the MSB.

A proportion of seeds from four collections made in August 2022 were sent to the MSB within 2-weeks of collection (see Annex 4.6). Whilst a proportion of seeds from the remaining 8 collections made in June stayed in their respective storage conditions for 6-months before being duplicated to the MSB in January 2023 (see Annex 4.7).

2.9 Seed viability determined upon arrival at the MSB.

Seeds sent to the MSB in both September 2022 and January 2023 were stained using fluorescent dye and their viability determined through a fluorescent microscope. This is the standard procedure for determining viability for orchids at the MSB.

2.10 Seeds at the MSB placed in -196 degrees Celsius.

50% of the seeds sent to the MSB has been placed in the cryo-facility at -196C. This was done for the 4 collections that arrived in September 2022 and the further 8 collections that arrived in January 2023.

Activities 2.11 and 2.12 will be completed in Year 2.

3.2 Progress towards project Outputs

Output 1 Enhanced capability of local stakeholders within the Yenokavan community to protect orchid diversity in situ.

Baseline: Minimal capacity for sustainable orchid conservation action within the local community and wider Armenia.

Change recorded: The project is making steady progress towards meeting Output 1. In Year 1, the project conducted a CITES training course in Yerevan to members of the Armenian Ministry of Environment and research institutions (see Figure 2 for attendance register). Prior to this project, no formal training on CITES has been conducted for members of the Ministry, who are responsible for the country's plant collection and export. At the end of the training, they marked at the usefulness of the information given and their confidence at carrying out their work more professionally. We will be conducting a survey in Year 2 to measure level of understanding and confidence. An MSc student has been recruited for the project and she is progressing well in her training and data collection (see Figure 4 and Annex 4.1 and Annex 4.2). Successful submission will enhance our understanding of local native orchids and increase the in-country capacity for plant conservation in Armenia. Plans are also underway for semi-structured interviews with local community members and subsequent participatory mapping of orchid threats and habitats scheduled for end of June 2023 (see Figure 7).



Figure 15 Environmental Ministry and Nature Heritage NGO members discussing challenges in plant conservation.

Output 2 In-country Armenian institution have the capacity and capability to conserve native orchid species ex situ and able to duplicate to the MSB cryopreservation unit.

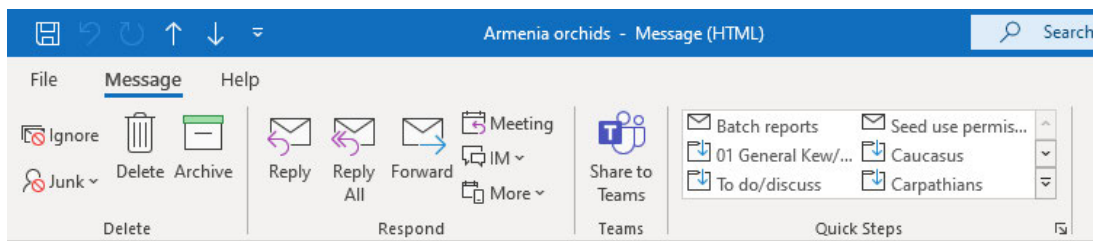
Baseline: No current capacity to conserve seeds of native orchids in Armenia and duplicate viable seeds to the MSB cryopreservation unit.

Change to date: The project is making good progress towards meeting Output 2. At the start of the project, no viable seeds of native Armenian orchids had ever been banked. At the end of Year 1, 67% of the collections duplicated to the MSB have viability above 70%, with 33% showing high viability (above 80%). We will repeat viability assessment in Year 2 to identify if there were any significant declines seen within a year of storage. Storage experiments with orchid seeds collected in Year 1 have all been viability tested after 6-months and analysis is underway to identify the most suitable storage conditions for future collections and species (Annex 4.8 for preliminary results).

Training conducted both in-country by project PI and at the MSB by the RBG Kew's team have ensured that conservation of native species is capable by current members of the National Seed Bank and Nature Heritage NGO.

Quote from Training Needs Assessment: *"All elements were very useful concerning our project on conservation of Armenian orchids. Most applicable are exceptional species seed processing"*.

The seed bank is now equipped with drying chambers and an ultra-cold -80°C freezer. The project will continue to monitor the equipment needs of the seed bank to ensure that the relevant protocol can be developed and taken up by the staff at the seed bank.



Armenia orchids



Sian McCabe
To Aisyah Faruk

You forwarded this message on 15/09/2022 10:21.

Hi Aisyah,

The microscope for FDA analysis can be used again and I have assessed the slides. The results are;

- SBAF-orchid-2022-1 Dactylorhiza euxina = 77% viability
- SBAF – orchid- 2022-2 Dactylorhiza arvilleana = 84% viability
- SBAF-orchid-2022-3 Cephalanthera damasonium = 55% viability
- SBAF-orchid-2022-4 Epipactis helleborine = 73% viability

I will put the collection to temporary storage and will bank them fully when they are accessioned.

Many thanks,

Sian

Figure 16 Evidence of viability assessment of seeds sent to the MSB from Armenia.

Science short courses – course feedback generic questions
Feedback form

Course title: Exceptional species technical attachment
Course date: 16.1. – 20.1.2023
Student name (not compulsory): *Anush Nersesyan*

Dear student

We would like to obtain your thoughts on the training course you have just attended. We would be grateful if you could take a few moments to fill out this form to help us to continue to improve quality across all Kew short courses. All feedback will be treated as confidential.

1. Please rate the following topics and add any comments:	Excellent	Good	Acceptable	Poor	Very poor
Your training needs					
How well did this course meet your training needs?		✓			
Course Content:					
Was the level of the course pitched correctly?		✓			
Was the amount of content covered in the course appropriate?		✓			
Teaching: Please rate the quality of teaching during the course					
Overall, were the presentations understandable?		✓			

When you complete with the aspect of teaching specify:

Figure 17 Part of Training Assessment of Dr Anush Nersesyan who attended training at the MSB. Remaining pages can be found in Annex 4.9a to Annex 4.9c.



Figure 18 Armenian team members collecting (left) and processing (right) orchids for the first time after receiving in-country training.

3.3 Progress towards the project Outcome

Outcome: Increase in capability and capacity of local communities, research institutions and private sector stakeholders to identify and conserve orchids in situ and ex situ

Indicator 1: By March 2023, 21 individuals working in conservation have an increased understanding on challenges and solutions for orchid conservation. **Baseline:** 0 individuals have insights over conservation solutions for orchids. To date, 19 (15 participants in the CITES training; 3 during the in-country meeting; 1 MSc student) have received training in the challenges and solutions of orchid conservation. Training Needs Assessment has been conducted for practical training at the MSB, and seed bank staff have awareness of proper conditions for ex situ conservation of seeds, leading to 67% of collections arriving with 70% viability. In Year 2, we will extend the project learning to a wider group of conservationists and re-engage with the 19 individuals to measure level of understanding at project end.

Indicator 2: By December 2023, 20 households will have contributed to identifying key areas for conservation and orchid collection/use, imparting this knowledge to environmental ministry, local NGOs, private sector stakeholders and 100 households within the Yenokavan community by March 2024. **Baseline:** 0 households contribute towards identifying orchid use and key conservation areas. No change as project activity is planned end of May.

Indicator 3: By January 2024, 10 species of orchids are conserved ex situ in their country of origin. **Baseline:** 0 species of orchid seeds conserved ex situ in Armenia. To date, 8 species of orchids have seeds conserved within the country of origin. Year 2 will target remaining species from different populations.

Indicator 4: By March 2024, an MSc thesis on key orchid habitats and their threats are made available to all relevant stakeholders. **Baseline:** No comprehensive study on orchid habitat and threats distributed to relevant stakeholders. No change, but progress is being made through the recruitment and training of student for data gathering.

Indicator 5: By March 2024, a working protocol for safe duplication of orchids to MSB, leading to their long-term conservation is adopted by staff members of the National Seed Bank. **Baseline:** No working protocol for safe duplication of orchids to the MSB. Preliminary data on response of seeds to different drying and storage conditions is being gathered.

3.4 Monitoring of assumptions

Assumption 1: Community members, rangers and private company staff are willing to take part in project activities and share information with project staff.

Comments: Assumption still holds true. Participation with local communities and other stakeholders will be essential to ensure the project Outcome is met. Currently, we have received favourable engagement with community members and tourist companies that organises trail walks in the region. As farming and tourism are key industries for the area, and potentially threaten local orchid populations, engagement is crucial.

Assumption 2: Suitable MSc student candidates can start by the proposed time, enabling key data collection to take place during the flowering season for orchids and complete a thesis within the time-frame of the project.

Comments: Suitable MSc student has been recruited and have started with project activities on time (see Section 3.1).

Assumption 3: Travel to and between the UK and Armenia is permitted to enable continuing training and project activities to take place. The ongoing dispute with Azerbaijan have made travel to Armenia slightly riskier than usual. Stricter visa controls with the UK have also made travelling to the UK for Armenian nationals difficult.

Comments: This assumption still holds true. Travel for MSB training was done for one member of staff and in-country training was done in July 2022. Community engagement training is scheduled for end of June 2023.

Assumption 4: Sufficient number of mature seeds available for collection, duplication and multiple storage facilities. Getting the timing right for seed collection is always difficult, particularly with a changing climate. We have mitigated this by setting up a ripening chamber in-country for unripe seed pods to ripen.

Comments: This assumption still holds true for the remaining 2 target species and 8 populations.

Assumption 5: Methods for viability assessment equally applicable across species. Staining techniques can vary across different species and interpreted differently depending on the member of staff. We are mitigating this by ensuring the same team member conducts the viability assessment at the MSB.

Comments: This assumption still holds true for the remaining 2 target species and 8 populations.

Assumption 6: National Seed Bank staff agree to accept working protocol and use equipment procured throughout the project's timeline.

Comments: This assumption still holds true. We are in the process of developing the protocol. Equipment is in-country and aims to be used for the coming seed collecting season.

3.5 Achievement of positive impact on biodiversity and poverty reduction

Training, equipment procurement and funding will allow 25% of Armenia's orchid flora conserved in-country. Currently, 19% of native orchid species in Armenia are conserved in Armenia and duplicated to the cryopreservation unit at the MSB, thereby increasing the percentage of orchids for future research, restoration, and species recovery.

Viability results from collections stored at different temperatures will generate novel data crucial for the development of working protocols. The experiment has now been set up and 6-month viability tests completed (see preliminary results Annex 4.8). The results from the work will be disseminated in the Millennium Seed Bank Partnership Newsletter by December 2024, extending the reach of project impact beyond current partners and region.

Key ecosystem services will be highlighted to stakeholders that utilise the local landscape and information on threats and orchid populations will contribute towards the Red Book of Armenia. The changes for this will be apparent in the second year of the project.

10 people from government, non-government and research institutions will have increased understanding of national and international legislation on orchid collection and trade, with 70% women being present, contributing towards gender equality. The project has exceeded this target with relation to available training (see Attendance Register Figure 2). A questionnaire in year 2 to the participants will measure level of understanding from the training.

Procurement will improve facilities and conservation outcomes, thereby attracting additional funds relating to biodiversity conservation and scientific research grants in-country. A significant change in the first year was the procurement and successful delivery of the -80C freezer, a first and only for the National Seed Bank (see Figure 13). This will allow the team to store species with potentially short-lived seeds and develop projects for long-term seed conservation.

One local student will gain a Masters degree during the project, contributing towards increasing potential employment in the long-term. Progress towards this is going well, with recruitment of an MSc student (Figure 4 and Annex 4.1).

Five in-country partners gain knowledge and skills in community engagement practices, benefiting ~20 households through participatory mapping exercise and 100 households aware of the links between biodiversity conservation in their community. Currently, three (Dr Nersesyan, Dr Papikyan and Dr Galstyan) have attended training and guided on the development of questionnaires. Further training of additional staff members (including MSc student) will take place in Year 2.

4. Project support to the Conventions, Treaties or Agreements

The training in exceptional species at the MSB and in-country training by PI in Year 1 has contributed towards Armenia's National legislation on Red List Species, and its Development Strategy 2014-2025, particularly Strategic Directions 2.6.1.b, to enhance training of specialists in biodiversity studies. The project activity aligns with the IUCN/SSC Orchid Specialist Group Conservation Action Plan (<https://portals.iucn.org/library/efiles/documents/1996-024.pdf>) through ex situ conservation of orchid seeds within the country of origin.

Armenia has been a signatory of the CBD since 1992 and a party since 1993. Progress towards contributions of the following strategic goals A-E are as follows:

Aichi Targets (AT) 1, 4 and 5 through identifying key stakeholders within important biodiversity areas and raising awareness of the biodiversity and threats to orchid diversity. Participatory mapping and project learning will disseminate key strategies that can ensure landscape level conservation whilst improving rural livelihoods at the local level. **Progress to date:** Baseline surveys on level of understanding and leaflets on project objectives have been developed and will be distributed by the end of May 2023.

AT 12: Through ex situ conservation activities, the project will contribute towards halting the extinction of threatened species. **Progress to date:** 19% of Armenian orchid have seeds currently in long-term conservation in-country and at the MSB.

AT 18: Open consultative process with one local community will ensure the project outputs respect the knowledge and practices of local communities. **Progress to date:** Engagement

with target community has begun and further engagement is planned at the end of May and June.

ABS: Kew’s Access to Genetic Resources and Benefit Sharing policy (<https://www.kew.org/sites/default/files/abs-policy.pdf>) has been in place since 2001 and ensures project material is legally acquired and any benefits are shared fairly as agreed with partners in Access and Benefit Sharing Agreements. These are currently in place with proposed project partner. **Progress to date:** Agreement continues to be in place and active (see Annex 4.10 ABSA extension letter).

CITES: All orchids are covered under Appendix II or I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (n.d.), <http://www.cites.org>). The project will enhance understanding of CITES within Armenia, with links made between protect teams and key project stakeholders. **Progress to date:** CITES training delivered by RBG Kew’s Policy team completed in June 2022, attended by members of the CITES focal point for Armenia within the Ministry of Environment (see Section 3.1).

SDGs 15: The project aims to halt the degradation of natural habitats, and to integrate ecosystem and biodiversity values into local planning and development processes, particularly land-use such as agriculture and tourism. **Progress to date:** Community participation mapping workshop is planned for end of June 2023.

5. Gender equality and social inclusion

The development of questionnaires for community engagement takes into account gender, to measure the level of understanding and confidence towards decision-making process within the project. Semi-structure interviews are currently being conducted by women at the end of May. Training events so far have shown a higher proportion of women attending, increasing the skills and knowledge for women within the workplace.

Please quantify the proportion of women on the Project Board ¹ .	100%
Please quantify the proportion of project partners that are led by women, or which have a senior leadership team consisting of at least 50% women ² .	100%

6. Monitoring and evaluation

The Outputs and Activities within the project have been designed to contribute towards the project’s Outcome. In the first year, this is most evident in the successful duplication of seeds to the MSB post-training, three out of four collections showing above 70% viability, thereby contributing towards the capability of local institutions able to conserve orchids *ex situ*. We employ both qualitative (e.g. responses of Training Assessments and workshop surveys) and quantitative (e.g. number of seed collections and number of people trained) indicators of success to measure on-going progress towards project Outputs. An implementation timetable has been developed together with project partners and reviewed monthly. Nature Heritage staff members have overall responsibility of capturing appropriate data sources in-country, while RBG Kew is responsible for analysing and reviewing progress. Information is shared through email exchanges and online partner meetings. RBG Kew has an internal project monitoring process to identify shortfalls in both activities and finances through a traffic light system (red, amber and green). There are no changes to the M&E plans.

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

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

7. Lessons learnt

Over the past year, the main lessons and recommendations for future similar projects are below:

Challenges due to financial market fluctuations: Fluctuations in the financial market impacting the GBP-ARM exchange rates has been a significant challenge in our project. When the project budget was agreed, the exchange rates were stable, however, due to on-going financial crises brought about by COVID and political instability between Azerbaijan and Armenia, the amount received by partners were significantly less than expected, which impacted the in-country partner salaries and fuel intended for field surveys. We now need to monitor exchange rates closely to ensure disbursement is done during favourable times for key activities. Future projects should incorporate adequate contingency within their budget to account for significant fluctuations in exchange rates and gather this information during turbulent periods of time.

Challenges relating to travel for training: The MSB has been coordinating training events for over a decade and are aware of the challenges in getting participants to the UK for training due to visa requirements and restrictions. We mitigated this risk for the project by allocating more than one space for training in the UK and incorporating extra in-country training for seed collecting and processing. Recent years have seen tighter restrictions and increased requirements for UK visas for international and European visitors, so future projects will need to incorporate contingencies for specific objectives related to travel and training. For this project, active contact between the teams in UK and Armenia via emails, Facebook messenger and Whatsapp messages was crucial to continue the support and guidance for both the orchid collecting (i.e. maturity stages), processing (i.e. how to split collections) and community questionnaire development (i.e. what data to gather).

Importance of pre-project data gathering: Prior to the project starting the PI received a small pilot grant to digitise herbarium labels of orchids from various sources (herbaria in Armenia, UK and St Petersburg, and GBIF). Considering the limited seasons for seed collecting within this project (summers of 2022 and 2023), the digitised data became significantly instrumental to the success of the collecting aspect of the project. Without this data, the collecting team remarked that they would not have been able to locate many of the populations at the correct seed ripening time. Similar future projects will need to have access to detailed locality data of their intended species and/or populations if the objective of said project is to have collections as an objective. Alternatively, capability projects could include objectives relating to digitising herbarium labels and/or groundtruthing activities, as this would greatly enhance the capability of nations to conserve their biodiversity.

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

N/A

9. Risk Management

There have been no new risks to add to the Risk Register that were not previously accounted for either at the start of the project or reported at the Half Year report. The Risk Register has been updated with the following changes:

Risk: Unable to deliver large equipment to Yerevan. **Risk Status Change:** From Open to Closed – the risk didn't materialise. **Comment:** All equipment delivered to Yerevan and accessible by local staff members. **Mitigation:** None.

Risk: Restricted access to community. **Risk Status Change:** From New/Emerging to Open. **Comment:** The main activities planned in Year 2 is community engagement through semi-standard interviews and participatory mapping activities. **Mitigation:** Close communication with key members of the local community is currently underway with in-country partners to ensure activities are targeted at the appropriate time, accounting for weather and availability of community members.

Risk: Visa not issued for Armenian participants to attend training at the MSB. **Risk Status Change:** From New/Emerging to Closed - the risk materialised. **Comment:** Due to ongoing issues with the visa office, only one out of the two staff members was able to travel to the UK for training. **Mitigation:** We mitigated this risk by ensuring that continued support was given remotely to the seed bank staff in Yerevan. PI conducted an in-country training that included seed processing and viability staining. The additional training and support contributed towards successful duplication of seeds to the MSB. An online Seed Conservation Training is being run, which the remaining staff member will get a chance to attend in September 2023.

Risk: MSc student unable to collect data. **Risk Status Change:** From New/Emerging to Open. **Comment:** Newly recruited MSc student is now in place and starting her training in orchid identification and habitat assessments. Risk relating to travel restrictions and unsuitability of student. **Mitigation:** We have developed a working agreement with the local university to ensure availability of students and identified multiple potential sites for data collection.

Risk: Landscape use not collected by community. **Risk Status Change:** From New/Emerging to Open. **Comment:** The main activities planned in Year 2 is community engagement through semi-standard interviews and participatory mapping activities. **Mitigation:** In-country partners are engaging closely with key members of the community to ensure trust is built before gathering landscape use data later in the year.

10. Other comments on progress not covered elsewhere

N/A

11. Sustainability and legacy

In-country collaborators remain motivated to continue the project, with discussions on how to enhance further capacity to include potential cryo-facilities (see Comment in Annex 4.9b). Partners have promoted the CITES training through the Botanic Garden's Facebook page (see Annex 4.12 Post in Facebook in Armenian and Annex 4.13 Post in Facebook in English). Capacity build through the project is on track to being maintained through the state's commitment towards biodiversity conservation and the retention of staff through permanent contracts. NH continues to be a long-term partner with the MSBP through the extended Access and Benefit Sharing agreement, with a view to seek further funding for projects related to banking short-lived species. The capacity built through this project will increase funder confidence and gain a stronger position for successful applications. The sustained legacy will be through the long-term conservation of native seed collections both in the country of origin and at the MSB. We intend to widen our impact and secure project legacy through dissemination of project learning through the Millennium Seed Bank Partnership newsletter, thereby benefiting orchid conservation action across the seed banking community.

12. Darwin Initiative identity

A project page on Kew.org is live, with the Darwin Initiative acknowledged as a funder: <https://www.kew.org/science/our-science/projects/saving-armenias-orchids>. The Darwin logo is being used in the leaflets for distribution to local community (see Annex 4.11 Orchid introduction flyer). Posts on Twitter are done through the PI's Twitter account (@AisyahFaruk), with links to @Darwin_Defra. The first introductory tweet was during the June fieldwork where the post received 555 impressions, 34 engagements, 17 likes and 4 retweets:

13. Safeguarding

Has your Safeguarding Policy been updated in the past 12 months?	No
Have any concerns been investigated in the past 12 months	No
Does your project have a Safeguarding focal point?	Yes. Dr Aisyah Faruk; [REDACTED]
Has the focal point attended any formal training in the last 12 months?	No, latest safeguarding training was completed on 22/06/2021
What proportion (and number) of project staff have received formal training on Safeguarding?	Past: 22% [2] Planned: 44% [4]
Has there been any lessons learnt or challenges on Safeguarding in the past 12 months? Please ensure no sensitive data is included within responses.	
None to report for far.	
Does the project have any developments or activities planned around Safeguarding in the coming 12 months? If so please specify.	
In-country project partner will be given a presentation on the Safeguarding Policy prior to the participatory mapping event and have opportunity to discuss concerns/issues.	

14. 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 Initiative Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)				
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				

Capital items (see below)				
Monitoring & Evaluation (M&E)				
Others (see below)				
TOTAL	71,517	73,125		

M&E was incorporated within standard budget lines during the application. To avoid double counting we have included a separate M&E table below:

M&E project spend (indicative since last Annual Report)	2022/23 Grant (£)	2022/23 Total Darwin Initiative Costs (£)	Variance
Staff costs			
Operating costs			
Other			
TOTAL			



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

	Matched funding secured to date	Total matched funding expected by end of project
Matched funding leveraged by the partners to deliver the project.		
Total additional finance mobilised by new activities building on evidence, best practices and project (£)		

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

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

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

				Yes / No
				Yes / No
				Yes / No
				Yes / No

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

Project summary	SMART Indicators	Progress and Achievements April 2022 - March 2023	Actions required/planned for next period
<p>Outcome Increase in capability and capacity of local communities, research institutions and private sector stakeholders to identify and conserve orchids in situ and ex situ</p>	<ol style="list-style-type: none"> 1. By March 2023, 21 individuals working in conservation have an increased understanding on challenges and solutions for orchid conservation 2. By December 2023, 20 households will have contributed to identifying key areas for conservation and orchid collection/use, imparting this knowledge to environmental ministry, local NGOs, private sector stakeholders and 100 households within the Yenokavan community by March 2024 3. By January 2024, 10 species of orchids are conserved ex situ in their country of origin. 4. By March 2024, an MSc thesis on key orchid habitats and their threats are made available to all relevant stakeholders 5. By March 2024, a working protocol for safe duplication of orchids to MSB, leading to their long-term conservation is adopted by staff members of the National Seed Bank. 	<ol style="list-style-type: none"> 1. In progress. So far, 16 people have received training on challenges and solutions for orchid conservation. 2. In progress. Target community engaged. 3. In progress. 8 species currently conserved in-country. 4. In progress. MSc student recruited and currently receiving training on orchid identification and habitat assessments. 5. In progress. Various orchid seeds have been dried and stored at different temperatures and viability assessed at 6-months. Data currently being analysed to identify best practice. 	<ol style="list-style-type: none"> 1. A further 4 people will be trained and an assessment of their understanding of orchid conservation for the 21 individuals conducted. 2. Interviews with 20 households to be conducted in May 2023, participatory event scheduled end of June 2023. 3. Team gather data for 2 species and further populations ready for collecting season at the end of August 2023. 4. MSc student will conduct field surveys and gather data for her thesis. 5. Data from storage experiments after 6-months analysed and draft of working protocol developed by December 2023.
<p>Output 1. Enhanced capability to identify and protect orchid diversity in situ by local stakeholders within the Yenokavan community</p>	<ol style="list-style-type: none"> 1.1. 10 in-country staff, including the environmental ministry, protected area rangers, eco-tourism operators and research institutions (>60% women) trained on challenges in orchid conservation and trade by July 2022. 1.2 MSc student in place by December 2022, and capable of conducting orchid identification and habitat 	<ol style="list-style-type: none"> 1.1 Completed. Photos and attendance register can be found in section 3.1 and 3.2 of this report. 1.2 Partially completed. MSc student recruited (see evidence in section 3.1). Currently conducting training and capability will be assessed once she finishes field surveys. 1.3 In-progress. Due to agricultural activities, Yenokavan community leader suggests delaying interviews until May 2023. 1.4 Planning stage. Gathering of information scheduled for end of June 2023. 	

	<p>surveys by March 2023.</p> <p>1.3 Semi-structured interviews with 90 community members (~25% of Yenokavan community) to identify socio-economic background, current knowledge of in situ plant conservation, perceived benefit from orchid protection and orchid use completed by February 2023 and analysed by March 2023.</p> <p>1.4 Key orchid populations and current threats (including land and species use) gathered through community participatory mapping with 20 households (~20 women and 20 men) identified by December 2023.</p> <p>1.5 Resources and information on orchid identification, botanical guides and conservation action developed and distributed to ~100 households, local guides, and protected area rangers.</p> <p>1.6 MSc and partner present project findings to local communities, local land managers, NGOs, and private eco-tourism companies in a networking workshop by March 2024</p>	<p>1.5 Not started.</p> <p>1.6 Not started.</p>	
<p>Activity</p> <p>1.1 Challenges and perspectives in orchid conservation and trade training taking place in Yerevan in July 2022</p> <p>1.2 Recruitment and training of MSc student by partner institution on orchid identification and habitat assessment</p> <p>1.3 Best-practice on semi-structured interviews and community participatory mapping developed</p> <p>1.4 Partners and MSc student engage with and conduct semi-structure interviews</p> <p>1.5 Partners participatory mapping exercise with community members</p> <p>1.6 MSc student conduct orchid and habitat surveys</p> <p>1.7 Orchid habitat and land use map finalised for final networking meeting</p> <p>1.8 Orchid guidebook developed and 100 copies printed for distribution</p> <p>1.9 Networking meeting delivered to key stakeholders within the area (community members, NGOs, private tourism companies and local land managers) for networking meeting</p>		<p>1.1 Completed</p> <p>1.2 Completed</p> <p>1.3 In progress</p> <p>1.4 In progress</p> <p>1.5 In progress</p> <p>1.6 In progress</p> <p>1.7 In progress</p> <p>1.8 In progress</p> <p>1.9 In progress</p>	<p>1.3 Scheduled for May 2023</p> <p>1.4 Scheduled for May 2023</p> <p>1.5 Schedule for end of June 2023</p> <p>1.6 Throughout June to August 2023</p> <p>1.7 Scheduled for August 2023</p> <p>1.8 Scheduled to be completed in January 2024</p> <p>1.9 Scheduled for March 2024</p>

<p>Output 2. Armenian institution have capacity to conserve native orchid species ex situ, able to duplicate to the MSB cryopreservation unit, and able to disseminate learning to other MSBP partners</p>	<p>2.1 Two Armenian seed bank team attend a 2-week orchid seed conservation technical attachment training programme at the MSB and capable of cleaning, banking, and evaluating viability by February 2023.</p> <p>2.2 Trained staff members imparting learned knowledge and skill in seed banking and duplicating orchid seeds to another 8 in-country conservationists (60% women) by March 2023</p> <p>2.3 At least two populations of 10 orchid species identified through completed locality surveys, and partners ready for collecting activities by December 2022</p> <p>2.4 Seeds, herbarium, and associated data collected from two populations per species for 4 species by December 2022 and a further 6 species by September 2023.</p> <p>2.5 100% of seed collections cleaned, dried, and stored using equipment available in-country and subset duplicated to the MSB showing no significant fall in viability for at least 70% of collections by March 2024</p> <p>2.6 Project related results disseminated throughout the Millennium Seed Bank Partnership through articles and a blog</p>	<p>2.1 Partially complete. Due to visa rejection, only one staff member was able to attend the MSB training course. Both have shown their capability of cleaning and banking seeds through successful staining of seeds and duplicating collections to the MSB in September 2022 and January 2023. Evidence can be found in section 3.1 and 3.2 and Annex 4.6 and 4.7.</p> <p>2.2 In progress. This will be carried out throughout the project. A presentation on the project objectives and challenges have been given to staff of the National Seed Bank. Photo evidence found in section 3.1 and presentation in Annex 4.5.</p> <p>2.3 Partially completed. Evidence can be found in Annex 4.6 and 4.7. Full data transfer sheet will be provided at project end.</p> <p>2.4 Partially completed. Evidence can be found in section 3.1 and 3.2, and Annex 4.6 and 4.7.</p> <p>2.5 Partially complete. 67% are currently showing over 70% viability.</p> <p>2.6 Not started but data being gathered for article and blog.</p>	
<p>Activity 2</p> <p>2.1 Two Armenian seed bank team travel to MSB for 2-week training attachment programme</p> <p>2.2 Delivery of in-country training on orchid ex situ conservation</p> <p>2.3 Procurement of equipment for collecting, cleaning and banking</p>		<p>2.1 1 out of 2 attended the training programme</p> <p>2.2 Completed</p> <p>2.3 Completed</p>	<p>2.1 Training was done in-country</p> <p>2.5 to 2.10 Further 2 species and 8 collections targeted in 2023-2024 collecting season.</p>

<p>2.4 Locality survey of orchid populations for seed collection activity</p> <p>2.5 Seeds, herbarium, and data of 10 orchid species collected from multiple populations</p> <p>2.6 Seeds are cleaned, dried and pre-storage viability determined in Armenia</p> <p>2.7 Seeds are stored in -20 degrees Celsius and -80 degrees Celsius in-country</p> <p>2.8 Subset of seeds from the different storage conditions are sent to the MSB</p> <p>2.9 Seed viability determined upon arrival at the MSB</p> <p>2.10 Seeds at the MSB placed in -196 degrees Celsius</p> <p>2.11 Article written for MSBP newsletter to outline project findings</p> <p>2.12 Blog post for Kew and local institution webpage</p>	<p>2.4 Completed</p> <p>2.5 In progress</p> <p>2.6 In progress</p> <p>2.7 In progress</p> <p>2.8 In progress</p> <p>2.9 In progress</p> <p>2.10 In progress</p> <p>2.11 Not started</p> <p>2.12 In progress</p>	<p>2.11 To be concluded before end of project.</p>
--	---	--

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

Project summary	SMART Indicators	Means of verification
<p>Outcome:</p> <p>Increase in capability and capacity of local communities, research institutions and private sector stakeholders to identify and conserve orchids in situ and ex situ</p>	<p>By March 2023, 21 individuals working in conservation have an increased understanding on challenges and solutions for orchid Conservation.</p> <p>By December 2023, 20 households will have contributed to identifying key areas for conservation and orchid collection/use, imparting this knowledge to environmental ministry, local NGOs, private sector stakeholders and 100 households within the Yenokavan community by March 2024.</p> <p>By January 2024, 10 species of orchids are conserved ex situ in their country of origin.</p> <p>By March 2024, an MSc thesis on key orchid habitats and their threats are made available to all relevant stakeholders.</p> <p>By March 2024, a working protocol for safe duplication of orchids to MSB, leading to their long-term conservation is adopted by staff members of the National Seed Bank.</p>	<p>Attendance register and Training assessment forms</p> <p>Attendance register, final map, distribution letter and photos</p> <p>Data transfer forms</p> <p>Thesis</p> <p>Collection transfer form, viability assessment form and draft protocol</p>
<p>Output 1</p> <p>Enhanced capability to identify and protect orchid diversity in situ by local stakeholders within the Yenokavan community</p>	<p>1.1 10 in-country staff, including the environmental ministry, protected area rangers, eco-tourism operators and research institutions (>60% women) trained on challenges in orchid conservation and trade by February 2023.</p> <p>1.2 MSc student in place by December 2022, and capable of conducting orchid identification and habitat surveys by March 2023.</p> <p>1.3 Semi-structured interviews with 90 community members (~25% of Yenokavan community) to identify socio-economic background, current knowledge of in situ plant conservation, perceived benefit from orchid protection and orchid use completed by February 2023 and analysed by March 2023.</p> <p>1.4 Key orchid populations and current threats (including land and species use) gathered through community participatory mapping with 20 households (~20 women and 20 men) identified by December 2023.</p> <p>1.5 Resources and information on orchid identification, botanical guides and conservation action developed and distributed to ~100 households, local guides, and protected area rangers.</p>	<p>1.1 Attendance register, Training Assessment</p> <p>1.2 Scan of MSc contract, data from field surveys</p> <p>1.3 Interview register and data</p> <p>1.4 Attendance register, scan of map</p> <p>1.5 PDF copy of guide, distribution declaration</p> <p>1.6 Attendance register, copy of presentation; minutes of meeting</p>

	1.6 MSc and partner present project findings to local communities, local land managers, NGOs, and private eco-tourism companies in a networking workshop by March 2024.	
Output 2 Armenian institution have capacity to conserve native orchid species ex situ, able to duplicate to the MSB cryopreservation unit, and able to disseminate learning to other MSBP partners	2.1 Two Armenian seed bank team attend a 2-week orchid seed conservation technical attachment training programme at the MSB and capable of cleaning, banking, and evaluating viability by February 2023. 2.2 Trained staff members imparting learned knowledge and skill in seed banking and duplicating orchid seeds to another 8 in-country conservationists (60% women) by March 2023. 2.3 At least two populations of 10 orchid species identified through completed locality surveys, and partners ready for collecting activities by December 2022. 2.4 Seeds, herbarium, and associated data collected from two populations per species for 4 species by December 2022 and a further 6 species by September 2023. 2.5 100% of seed collections cleaned, dried, and stored using equipment available in-country and subset duplicated to the MSB showing no significant fall in viability for at least 70% of collections by March 2024. 2.6 Project related results disseminated throughout the Millennium Seed Bank Partnership through articles and a blog	2.1 Attendance register, training assessments 2.2 Attendance register, training assessments 2.3 Field data, procurement receipts for collecting equipment 2.4 Data transfer form 2.5 Procurement receipt for processing equipment, viability assessment sheet, data, and collection transfer form 2.6 Link to online article and blog post, email correspondences
Activities 1.1 Challenges and perspectives in orchid conservation and trade training taking place in Yerevan in July 2022 1.2 Recruitment and training of MSc student by partner institution on orchid identification and habitat assessment 1.3 Best-practice on semi-structured interviews and community participatory mapping developed 1.4 Partners and MSc student engage with and conduct semi-structure interviews 1.5 Partners participatory mapping exercise with community members 1.6 MSc student conduct orchid and habitat surveys 1.7 Orchid habitat and land use map finalised for final networking meeting 1.8 Orchid guidebook developed and 100 copies printed for distribution 1.9 Networking meeting delivered to key stakeholders within the area (community members, NGOs, private tourism companies and local land managers) for networking meeting 2.1 Two Armenian seed bank team travel to MSB for 2-week training attachment programme 2.2 Delivery of in-country training on orchid ex situ conservation 2.3 Procurement of equipment for collecting, cleaning and banking 2.4 Locality survey of orchid populations for seed collection activity 2.5 Seeds, herbarium, and data of 10 orchid species collected from multiple populations 2.6 Seeds are cleaned, dried and pre-storage viability determined in Armenia 2.7 Seeds are stored in -20 degrees Celsius and -80 degrees Celsius in-country 2.8 Subset of seeds from the different storage conditions are sent to the MSB 2.9 Seed viability determined upon arrival at the MSB 2.10 Seeds at the MSB placed in -196 degrees Celsius 2.11 Article written for MSBP newsletter to outline project findings		

Important Assumptions

- Community members, rangers and private company staff are willing to take part in project activities and share information with project staff
- Suitable MSc student candidates can start by the proposed time
- Travel to between the UK and Armenia is permitted
- Sufficient number of mature seeds available for collection, duplication and multiple storage facilities
- Methods for viability (in vitro, vital stain) assessment equally applicable across species
- National Seed Bank staff agree to accept working protocol and use equipment

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	10 in-country staff, including the environmental ministry, protected area rangers, eco-tourism operators and research institutions (>60% women) trained on challenges in orchid conservation and trade by July 2022.	[DI-A01] Number of people from key local stakeholders completing relevant training on orchid trade and conservation. Baseline: 0 people trained on orchid trade and conservation	People	Men/Women	15 (2 men /13women)			15	10 (4 men/6 women)
DI-A02	Two Armenian seed bank team attend a 2-week orchid seed conservation technical attachment training programme at the MSB and capable of cleaning, banking, and evaluating viability by August 2022	[DI-A02] Number of training placement at the MSB completed by individuals of key national stakeholders on banking exceptional species. Baseline: 0 people on training placements for conserving exceptional species.	People	Men/Women	1 (0 men/1 women)			1	2 (no gender target)
DI-A03	100% of seed collections cleaned, dried, and stored using equipment available in-country and subset duplicated to the MSB showing no significant fall in viability for at least 70% of collections by March 2024	[DI-A03] Number of local organisations with improved facilities and staff knowledge for seed banking short-lived species Baseline: 0 local organisation with capability and capacity to bank short-lived species.	Institutions	National Seed Bank of Armenia	1			1	1
DI-A05	Trained staff members imparting learned knowledge and skills in seed banking and duplicating orchid seed to another 8 in-country conservationists	[DI-A05] Number of project partners reporting to have delivered further training to other members of staff on orchid conservation by project end Baseline: 0 trainers trained staff	People; Number trained	Men/Women	1 trainer; 0 trained			1	2 trainers; 8 trained (4 men /5 women)
DI-C04	Key orchid populations and current threats (including land and species use) gathered through community participatory mapping with 20	[DI-C04] New assessments of biodiversity resource use for the Yenokavan community published. Baseline: 0 assessment available	Number	Participatory mapping Semi-structure interviews	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
	households (~20 women and 20 men) identified by December 2023.								

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)

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.	
Have you included means of verification? You should not submit every project document, but the main outputs and a selection of the others would strengthen the report.	YES
Do you have hard copies of material you need to submit with the report? If so, please make this clear in the covering email and ensure all material is marked with the project number. However, we would expect that most material will now be electronic.	NO
If you are submitting photos for publicity purposes, do these meet the outlined requirements (see section 15)?	N/A
Have you involved your partners in preparation of the report and named the main contributors	YES

Have you completed the Project Expenditure table fully?	YES
Do not include claim forms or other communications with this report.	