

## Darwin Initiative Main and Post Project Annual Report

To be completed with reference to the “Writing a Darwin Report” guidance: (<http://www.darwininitiative.org.uk/resources-for-projects/reporting-forms>). It is expected that this report will be a **maximum** of 20 pages in length, excluding annexes)

**Submission Deadline: 30<sup>th</sup> April 2020**

### Darwin Project Information

Project reference	26-005
Project title	Green Health: improving indigenous participation through the CBD's ABS
Host country/ies	Guatemala
Lead organisation	University College London
Partner institution(s)	Universidad del Valle de Guatemala
Darwin grant value	324.056 GBP
Start/end dates of project	01 May 2019 – 30 November 2021
Reporting period (e.g., Apr 2018 – Mar 2019) and number (e.g., Annual Report 1, 2, 3)	May 2019 – March 2020 Annual Report 1
Project Leader name	Michael Heinrich
Project website/blog/Twitter	<a href="https://twitter.com/HealthDarwin">https://twitter.com/HealthDarwin</a>
Report author(s) and date	Monica Berger, Francesca Scotti, Michael Heinrich, Alan Hesketh, Martin Hitziger– 20 <sup>th</sup> April 2020

### 1. Project rationale

Many global trends relevant in the context of challenges to global biodiversity and its sustainable use are exemplified by the developments in Guatemala. Biodiversity loss in the Guatemala's Petén lowlands and central highlands is rapidly increasing due to urbanization, African palm plantations, and cattle farms (Torres, 2018). Our previous projects in these areas (MACOCC, Berger et al., 2016) co-researching use of medicinal plants with Q'eqchi' and Kaqchikel healers (Hitziger et al., 2016) show many species are at risk due to habitat loss and degradation, having a negative impact on livelihoods of vulnerable and impoverished indigenous populations. Up to 60% of the local populations with poor access to official healthcare services rely mainly on traditional Maya practitioners (Hitziger, Berger et al., 2017), which is compromised by losing this natural capital. Biodiversity loss hinders access, while marginalization excludes traditional knowledge holders from benefits. Through a transdisciplinary platform involving indigenous groups, government, UK and Guatemalan academia, and the private sector, we collaboratively research Mayan medical use of biodiversity, develop mechanisms protecting this knowledge, augmenting access and sustainable use, assessing its potential, and defining mechanisms for benefit sharing to increase health and prosperity of marginalized groups. The consortium is researching medicinal plant knowledge in order to protect it, and to develop strategies for ascertaining the equitable and sustainable use of biodiversity. With limited research capabilities in Guatemala, this requires international collaboration and equitable access to such biological resources for the purpose of research, requiring importantly implementing international

biodiversity policies at a national level based on a community driven approach (document Raxnaq'il-Nuk'aslemal: Maya Medicine in Guatemala, 2016). This project follows on a collaboration which involved some of the key researchers during their PhD (Monica Berger Gonzales and Martin Hitziger) and the project's overall coordinator (Michael Heinrich). It uses a transdisciplinary process with five Councils of Maya Elders, Guatemalan and European academics, health practitioners, and government representatives that since 2010 has addressed equitable access to healthcare supporting cultural perseverance. Guatemala ratified the Nagoya protocol, but lacks procedures for putting access and benefit sharing (ABS) into practice. The project aims at mutually acceptable implementation procedures that comply with pertinent national and international regulations. Implementing ABS mechanisms, linked to ongoing empirical research on traditional medicine and intercultural health, will foster mutual appreciation of the procedures. We specifically address the challenge to secure the benefits of biodiversity for the most vulnerable, poor communities. Petén in particular has a Human Development Index of 0.33 (IDH report UNGua 2018), one of the lowest in the regions. Alternative sources of income related to sustainable use of biodiversity are of great importance.

The project is located in Guatemala, mainly in the Petén Department in the North of the country. The local indigenous partner is the ACGERS Council (Association of Councils of Spiritual Guides Releb'aal Saq'e') based in the Poptún Municipality (red area coloured in the map). However, the network of Q'eqchi' indigenous healers working in this project extends to the regions of Izabal, Alta Verapaz and Baja Verapaz (red stars).



Figure 1. Map of Guatemala showing location of the project activities.

**2. Project partnerships**

UCL has developed a formal partnership with Universidad del Valle de Guatemala (UVG) as the local leading institution in charge of most research activities in the Petén, and with Indígena Biodiversity Ltd., an industrial partner (SME) that provides the know-how and links relevant for future ABS agreements with the relevant sectors of industry (esp. pharmaceutical, supplements, cosmetic sectors). Through UVG the transdisciplinary platform has extended collaboration with the Indigenous Council of Elders ACGERS, the Guatemalan Government authorities responsible of the regulation of biodiversity use (CONAP, MARN) and other interest groups, such as the Kaqchikel Maya University. Additionally, it has established collaborative

links with the CITES office of the United Nations in Geneva, a partner facilitating collaboration with multilateral cooperation offices based in Guatemala (Indicators 0.1, 0.2, 1.2, evidence 1.1b, 1.1c).

This research design and collaboration is based on clearly identified and prioritized problems at the local level. The Transdisciplinary (TD) platform created for project management affords equal footing to all partners, allowing an open discussion of interests and facilitating the joint development of operational plans, implementation methods and monitoring responsibilities. Decision-making follows a consultative process through a Steering Committee, which is integrated by all project partners, created at the kick-off TD meeting in August 2019. This can be seen in the memoire of the meeting presented in file 1.1b (Indicator 1.2).

The partnership has been successful in conducting research activities according to the operational plan agreed at the TD meeting (evidence file 1.3b), but it has encountered management/administration challenges (see details in Section 9, under “Administrative Level”).

### **3. Project progress**

#### **3.1 Progress in carrying out project Activities**

##### **Output 1:**

##### **1.1 A ‘round table’ comprising all relevant stakeholders to sign a cooperation agreement for the project’s duration, following a TD format.**

This activity took place on the 26-27 Aug 2019 in the manner and time planned. A successful meeting with all the relevant stakeholders was held with intensive discussions about the project’s purpose and a general agreement on future activities. The government agency CONAP completed its institutional process to adhere to this project formally in September 2019, assigning two officials.

Evidence: Attendance sheets file 1.1a, minutes file 1.1b, cooperation agreement 1.1c, agenda 1.1d, UVG request for CONAP involvement and cooperation in the project 1.1e, CONAP agreement to cooperate 1.1f

##### **1.2 Writing and submission of IRB protocols for UK, Guatemala and Maya Council.**

This activity has been completed in terms of writing and submitting in the time and manner planned, but approval from UVG has not been obtained yet. The president of UVG ethics board finished his term in 2019 and the process to appoint a new one delayed the usual review process of submitted protocols. On April 2020 the IRB of UVG responded to the request for ethical approval and requested minor changes that have already been re- submitted. Final approval is expected by the end of April.

It was established that there was no need to submit an application for the UK partner as none of the UCL team members is to lead activities involving research with human subjects. Ethical protocol for Maya council was followed according to consuetudinary Q’eqchi’ law (evidence file 1.2a).

Evidence: Submitted and resubmitted ethical protocol for UVG including Annexes, evidence folder 1.2b, and latest formal response letter from UVG Ethics Board (Apr 2020), file 1.2c

##### **1.3 Appointment/election of a TD steering board constituted by at least 30% women and 25% indigenous leaders, signing of MOU with operational plan for year 1.**

This activity took place on the 26-27 Aug 2019 in the time and manner planned. Currently the Board includes six women out of 13 members, accounting for 46%, and 7 indigenous people accounting for 54%. An operational plan based on the logframe was revised by all parties present at the workshop.

Evidence: List of elected TD Board members file 1.3a, operational plan file 1.3b.

Refer back to files 1.1a and 1.1b for minutes and attendance sheets.

##### **1.4 Steering board meetings are conducted to discuss the development of the framework with all stakeholders (including preparation of materials for discussion).**

This activity took place on the 26-27 Aug 2019 in the time and manner planned. More meetings are scheduled for Y2 and Y3.

Materials prepared for the steering board discussion included several PowerPoint presentations by each member, explaining the project and the framework, issues, aims and objectives, skills

and knowledge available. Such ppt files are available on request but, as they are considerably lengthy, have not been included in this report file. A booklet explaining terminology across cultures and introducing the concept of TransDisciplinary workshop was prepared ahead of the first meeting.

Evidence: Explanatory booklet file 1.4a.

Refer back to files 1.1a and 1.1b for minutes and attendance sheets.

### **1.5 Conduction of eight TD workshops for discussion and negotiation of components for implementing Addis Ababa's principles and Nagoya.**

The first TD workshop took place on the 26-27 Aug 2019 in the time and manner planned.

The second took place on 23 Nov 2019 in the frame of a convention of many other indigenous associations discussing the impact of destroyed Maya sites, where the project team consulted potential implications of regulating biodiversity use and ancestral knowledge.

The third was scheduled for June 2020, but due to the COVID-19 outbreak it was cancelled (to be rescheduled).

Evidence: Minutes and participant list for second TD workshop file 1.5a

Refer back to files 1.1a and 1.1b for the first TD workshop evidence.

## **Output 2:**

### **2.1 Organisation of community meetings via ACGERS Council to present project details to elders, individual enrolment of healers, creation of participants' list within Maya ceremonial protocol.**

This activity took place in the time and manner planned and it is now concluded. The project has been presented to the elders, healers have been enrolled, following Maya ceremonial protocol.

Evidence: June 2019 report (including pictures) file 2.1a, December report (including pictures) file 2.1b, List of enrolled healers file 2.1c.

Please note that the December report (2.1b) includes data on the parallel (partner) project InterHealth (led by Prof. C. Maake, Uni Zuerich, CH, which includes Dr. Berger as a partner, but not the lead of Green health M. Heinrich or Indigena Ltd); for easier understanding the parts relative to the Darwin project have been highlighted in green.

### **2.2 Initial ethnographic research of most-common referred plant lists per ailment (syndromic and cultural ailments).**

From July to December 2020, ethnographic fieldwork took place through the ACGERS Council where 16 enrolled Q'eqchi' healers from four Departments (see Figure 1) documented all treated patients using "Cultural Epidemiology Booklets". These booklets produced a database of over 200 entries of patient consults to Maya Ajilonel and the consequent treatments followed by healers, providing a list of 319 plants in local terminology. This integrated list was the basis for the initial ethnobotanical fieldwork trips.

Evidence: booklets information database (until Dec 2019) file 2.2a, list of plants mentioned in the booklets (names in Q'eqchi') file 2.2b.

### **2.3 Participatory observation, interviews and focus groups to build up medical case studies.**

This activity is ongoing. The Q'eqchi' Ajilonel, traditional healers, recorded initially about 200 patient case stories as referred in section 2.2. Following this exercise, the Council received training for implementing Phase 2 of the research protocol, where selected patient cases are to be systematically recorded to follow-up detailed Maya medical treatment and use of local plants. In late February healers started referring the first patient cases, which need the clinical verification process of a Medical Doctor from our team. We were awaiting ethical approval from UVG's IRB in order to start this process when COVID-19 alert was implemented in Guatemala. All activities involving patients being moved across municipal lines are suspended until at least June 2020.

Evidence: Initial clinical files of referred patients for in-depth case reconstruction, folder 2.3a

Refer back to file 2.2a for the database of case studies from booklets

### **2.5 At least 90% of plants used by the healers in the medical case studies are collected, deposited and identified at UVG herbarium.**

This activity has started and is scheduled to be completed by the end of Q3 of Y2. So far, the epicultural booklets list 319 plants (see file 2.2b) used by 16 Ajilonel. In all prior fieldwork trips, 138 specimens have been collected, curated, and are under study at the UVG herbarium for species identification.

For March more collection field trips were scheduled in 3 territories: 8-13 March, Petén; 24-29 March, Izabal and Alta Verapaz. In those instances, the UVG Team would have had the chance to collect the remaining plants referred to in the cultural epidemiology booklets from the pending healers but due to emergency measures against coronavirus, these field trips had to be postponed. There is the hope that the situation might improve in early May to allow the collection of plants that only bloom in this specific time of the year. As flowering occurs usually in March-April and Nov-Dec each year, there might be a need to expand collection times in Y2 and Y3.

Evidence: Database of plant listed-identified-deposited up to March 2020 file 2.5a.

## **2.6 Integration of academic knowledge on the species collected through literature research on traditional uses, toxicological and pharmacological assessment (safety and efficacy) based on bibliographic evidence.**

This activity has started and is due to continue until the end of Y2. Not all plant specimens could be collected in the scheduled time (as explained in section 3.1 – Activity 2.5). Therefore, at the moment the list of plants identified is incomplete. Nonetheless existing scientific evidence on selected species has been researched in relation to the list of plants already available.

Evidence: Literature information available on plants identified (as of Feb 2020) file 2.6a.

### **Output 3:**

#### **3.1 Sharing information on medicinal species (from Output 2) with industrial partners and identification of species with commercial potential, protectable by IP rights.**

This activity has started, and is due to continue into the first quarter of Y2. For the reasons mentioned for Activity 2.5, the list of identified plants is still incomplete at the moment.

Nonetheless the information gathered in regards to the many, already identified, species have been shared with the industrial partners, who have started their evaluation.

Evidence: Anonymised report on the first species file 3.1a

#### **3.3 Stakeholders meetings/workshops lead by the industrial partners to build a model ABS agreement.**

Next stakeholders' meeting was scheduled for May 2020 but, due to the COVID-19 outbreak, this activity had to be delayed to a date yet to be established. It is likely that initial discussions will take place on online platforms but it is considered fundamental to interact in person to keep engagement and trust between stakeholders (please see the document on COVID-19 impact on the Green Health Project, provided in Annex 4).

#### **3.5 Stakeholders' meetings to discuss examples of non-monetary benefits of interest to the communities involved or propose new ones.**

Two meetings have been conducted with the ACGERS Council to develop relevant mechanisms demanded by the Q'eqchi' Ajilonel (healers and spiritual guides) to improve access to rapidly endangered medicinal plants. The first meeting occurred in Nov 2019 to hear the Council's idea for a plant nursery and to draft the initial land use distribution of the Council's headquarters. The second meeting took place on 5 Jan 2020 to discuss the building of a small room that would serve as office and to store nursery materials, the installation of electricity and introduction of water. A Guatemalan partner obtained a small private donation for the Council to begin implementation of those three aspects and obtained in-kind donation of a local architectural firm to donate blueprints for the measurement of the land and posterior co-design of the Council's house amidst the garden. An expert in permaculture and subtropical specimens' reproduction has been hired to formally continue the medicinal plant nursery and garden implementation with the Council once COVID-19 quarantine is revoked.

Evidence: Garden progress report file 3.5a.

Refer back to file 1.5a for minutes of the first meeting.

## **Output 4:**

### **4.1 Establish the baseline of access and availability of medicinal plants to the healers**

During plant collection walks, GPS coordinates were collected and could be triangulated to extrapolate the distance from the healer's village. Collection walking time was also recorded. Evidence: Tables of time and general location is available on file 2.1b; GPS coordinates are available on request.

### **4.3 Creation of medicinal plant gardens and seed repository (following technical assessment of the areas, suggested by ACGERS, and adaptation needs for reproduction of selected species)**

This activity is scheduled to start in Y2, meanwhile planning has already started, as mentioned above in Activity 3.5.

Evidence: Garden progress report file 3.5a

## **Output 5:**

### **5.2 Writing of academic papers**

A meeting with scientists from Latin American countries was held in October 2019, at UCL with the intent to build a larger collaboration on the Nagoya protocol and the CBD. An academic paper on the relative perspectives on access and benefit sharing (ABS) was produced and submitted for publication on *Frontiers in Pharmacology* (Open Access). As of 26 Apr 2020 it has been accepted pending minor revisions. This publication is based on a meeting co-funded by UCL's Global Engagement Office offered the opportunity to develop a wider understanding of the different approaches in four major Spanish Speaking American countries (Chile, Colombia, Peru and México), as well as two smaller ones (Guatemala and Panama). It will inform the project's strategy on how to implement change in Guatemala.

Evidence: Agenda of the meeting 5.2a, minutes file 5.2b, abstract of ABS paper 5.2c.

### **5.4 Conference presentations**

An abstract, describing the Green Health project, its aims and results so far, has been accepted for an oral presentation at the International Society of Ethnopharmacology meeting of 2020 (the ISE2020, has been postponed, due to the COVID-19 outbreak, from April to November). Another abstract for a paper discussing the limits of collaboration, with focus on international scientific collaboration in light of the CBD and Nagoya has been submitted for the annual meeting of the Association of Social Anthropologists (ASA2020, to be rescheduled) and is currently awaiting response. Our main activities have been planned for years 2 and 3, and, obviously, there currently is considerable uncertainty regarding the scheduling of scientific meetings.

Evidence: Abstract for ISE2020 file 5.4a, abstract for ASA2020 file 5.4b.

## **3.2 Progress towards project Outputs**

*Output 1: Policy Framework: an implementation framework for a policy on biodiversity and ABS is developed through a dialogue between government, local indigenous groups, academia and industry, which could break down barriers and misunderstandings that have opposed the ratification of Nagoya, and serve as a basis for future research collaboration on traditional medical Maya knowledge, sustainable use of biodiversity, intellectual property recognition and other forms of benefit sharing*

Currently, the project has successfully managed to bring together all stakeholders. Each stakeholder has agreed to participate and has met in person with the others at least once at the steering board election and Transdisciplinary (TD) Workshop held in August 2019 (Indicator 1.2). A dialogue was initiated and maintained. During the workshop a TD steering board, matching Indicator 1.1, was elected. A second TD workshop took place in November 2019 without the European collaborators.

Evidence for Indicators 1.1. and 1.2: Attendance sheets 1.1a, minutes of first TD workshop file 1.1d, elected TD Board list file 1.3a, operational plan for Y1 file 1.3b, minutes of second TD

workshop file 1.5a Additional minutes have been summarized in file 1.6a, the original minutes are available on request.

Contact with CONAP (as the Agency representative of the Guatemalan government in this project) and the indigenous community involved in the project has been constantly maintained by the UVG Team, through meetings, emails and activities. The European collaborators have been maintaining coordinated contact with the UVG Team via email and conference calls. A third TD Workshop, the second with the participation of all stakeholders, was scheduled to take place in the beginning of June 2020, but, due to the uncertainty brought by the COVID-19 outbreak, it had to be cancelled. The policy draft for ABS (Indicator 1.3) is to be preliminarily drafted in Y2 Q1, and was to be discussed with the TD steering board in the June TD workshop. The workshop will be rescheduled and possible dates and alternative logistical avenues are being investigated at the moment.

Ethical approval for the project (Indicator 1.4) has been obtained from the Maya council in Sep 2019. Submission of plant collection permits to the CONAP Council were completed in 2019. Due to long waiting periods for approval of multi-site collection, researchers used the license awarded on an annual basis to UVAL-UVG herbarium. Ethical approval from UVG has not been obtained yet, despite protocol submission in September 2019 and a 1-2 months forecast for feedback. See explanation in Section 3.1 – Activity 1.2.

Evidence for Indicator 1.4: Letter of ethical approval from the IRB of Guatemala, signed agreement with Releb'aal Saq'e stating approval of Maya protocol compliance (equivalent to an IRB) file 1.2a, submitted ethical protocol folder 1.2b, UVG Ethics Board feedback (13 Apr 2020) file 1.2c.

Finally, agreement on guidelines for accessing traditional ecological knowledge (Indicator 1.5) is an activity that is core to Y2 work, which is based on the results of Y1 research, therefore there has not been any progress in this regard yet.

*Output 2: Information Collection: ethnomedical body of information on selected Maya phytomedicine is produced.*

Published literature on Maya medicinal plant knowledge, with special reference to Guatemalan data, is being researched and this activity will continue in Y2 (Indicator 2.1). Literature-based safety assessment has been started based on the list of species mentioned in the database of the epicultural booklets collected to date. This database includes all patient case studies undertaken by the healers enrolled. Cases collection is now over, even though collecting booklets from some healers was scheduled but was not possible due to the COVID-19 pandemic containment measures. They will be collected and uploaded in the database as soon as activities can be resumed. In the next term all the data from this database will be examined to select 25 patient cases to research in depth (Indicator 2.2). The 319 plant species listed in the epicultural booklets are being collected, identified and catalogued by the collectors and UVG Herbarium staff (Indicator 2.3). Established information in reference to the specimens collected are uploaded in a database (please note that due to COVID-19 outbreak, UVG is closed and any activity in the Herbarium is currently on hold, it is not clear when activity could be resumed but we expect delays in the identification of the latest specimens collected, which will delay updates in the database). This activity will continue in Y2.

Evidence for indicator 2.1 – information collected on species identified file 2.6a. Database of 319 plant species listed per healer in the epicultural booklets, file 2.2b

Evidence for indicator 2.2: Database epicultural booklets for the period Jul-Dec 2019 file 2.2a

Evidence for indicator 2.3: Database of botanical collection (up to March 2020) file 2.5a

*Output 3: Access and Benefit Sharing Proposal: proposal for access and benefit sharing and protection of intellectual property, based on mutually agreed terms, coordinated is defined by*

*the industrial partner, and reviewed by an independent ABS expert (to be coordinated by M. Hitziger).*

The information collected to date has been shared with the industrial partner who has started the evaluation of commercial potential (Indicator 3.1). More information should be provided in the next quarter, following updates on the Herbarium database. The scheduled TD workshop in June has been cancelled due to the COVID-19 outbreak and, provided it is not clear when it will now take place it is possible that agreement and approval of the proposal for benefit sharing (scheduled to happen by the end of Y2) might be delayed.

Evidence for Indicator 3.1: Anonymised report on the first species evaluating commercial potential file 3.1a

*Output 4: Local Framework: improved (from baseline) and sustainable access and availability of key medicinal plants for indigenous healers/communities based on locally defined strategies and terms, ensuring equal participation of women*

Increased access and availability will only be achieved later in the project, in the meantime planning of a locally managed medicinal garden has started.

Evidence for Indicator 4.1: Garden progress report file 3.5a

*Output 5: Dissemination: dissemination of the project's results and strengthening of the national dialogues on biodiversity and traditional knowledge. The dissemination will include CBD processes.*

One academic paper has been accepted pending minor revisions by Frontiers in Pharmacology which is an Open Access Journal (Indicator 5.1).

Two abstracts have been submitted for oral presentation in international conferences: the International Society of Ethnopharmacology (ISE, abstract accepted) and the Association of Social Anthropologists annual meeting (ASA, abstract submitted). Please note that ISE 2020 has been rescheduled for November, due to COVID-19 outbreak, ASA 2020 is being rescheduled for a date to be established (Indicator 5.5).

Evidence for Indicator 5.1: Frontiers paper abstract file 5.2c

Evidence for Indicator 5.5: Abstract for ISE 2020 file 5.4a, abstract for ASA 2020 file 5.4b

### **3.3 Progress towards the project Outcome**

***Outcome: Implementation framework for sustainable use, access and benefit-sharing in Guatemala involving consensus between indigenous groups, government, academia and industry, based on natural capital and traditional knowledge to sustain healthy livelihoods.***

*0.1 Participation of indigenous people within the project increased by at least 40% in relation to prior similar initiatives led by CONAP. Of these, by the project end, at least one fourth are women.*

This project is the first one of its kind in Guatemala, where indigenous peoples are invited to work with CONAP authorities, the private sector and academia in order to develop policy avenues related to ABS mechanisms. CONAP had previously conducted two initiatives with Tzutujil indigenous peoples in San Juan la Laguna and with Achi' peoples of Rabinal. In both cases they only did a cultural inventory of relevant plant uses in each region, guarded by Municipal Governments, but did not move forward into any concrete forms of ABS mechanisms (CONAP\_ABS program report 2018). The only other experience of CONAP with biodiversity use was with UVG and an international partner interested in precious woods, but it did not



involve any indigenous groups. Due to these circumstances, the baseline was estimated at zero participation of indigenous peoples in concrete ABS mechanisms, which makes this project ground-breaking in providing the first-ever case study to include the Q'eqchi' and Kaqchikel people in its negotiation process. Currently, the Steering Committee and Advisory Board for this project is integrated 54% by indigenous peoples. Of these, almost half (6/13) are women, which is well above the initial 25% the project is committed to.

*0.2 A multi-stakeholder, transdisciplinary process to foster dialogue at equal footing between government, academia, industry and indigenous communities has resulted in a new framework of collaboration by project end and is documented for replication.*

The process outlined in this indicator has been fostered throughout Y1, especially since the beginning of activities in 2019. This is very important as it lays the foundations for the development of a framework for collaboration, which is being documented throughout the whole project and will be the founding part of the manual which will be put together in the final stages of the project.

Evidence: June 2019 report file 2.1a, December report 2019 2.1b, minutes of August 2019 TD workshop file 1.1b (further minutes are available on request, see file 1.6a).

*0.3 New scientific information on indigenous Maya medical knowledge and on the relevance of natural capital to sustain healthy livelihoods (ethnography and plant collections in herbarium) based on collaborative research is produced by the end of the project.*

Collection of key information about indigenous medical practices (utilising local natural resources) through the use of epicultural booklets is complete and the information is translated into Spanish and added to a database. The species mentioned are being investigated in published scientific literature. The plants mentioned have been partly collected (collection has come to a halt due to the COVID-19 outbreak but the activity will continue as soon as possible) and are being identified. Deep ethnography using participatory methods alongside the Q'eqchi' Ajilonel will resume after quarantine is lifted by Guatemalan authorities. This TD process of joint-research following in-depth case reconstruction of selected patient cases will allow a deeper understanding into the links between forest use, the dependency on local plants of the indigenous medical system, the real access, or lack of it, to key ethnobotanical specimens, and the risks the Q'eqchi' ethnomedical system faces to continue providing critical healthcare to local populations. Overall, we expect that the convergence of multiple emic and etic views brought together through a TD mechanism improve trust building and will provide more scientifically and socially robust data by the end of the project.

Evidence: Booklets database file 2.2a, Botanical database file 2.5a.

*0.4 Maya healers have increased access to medicinal plants by at least 20% more through biodiversity protection initiatives in the study area by year 3, as evidenced through local repositories of biodiversity and knowledge about them.*

This indicator is at the core of the project and will be met as a result of the project activities, therefore at this stage the only real progress towards this indicator is in relation to the medicinal plant garden starting to be built (see section 3.1 of this report).

*0.5 A concrete strategy for benefit sharing opportunities for indigenous groups is defined and ready for implementation by project end.*

Initial assessment of a priority group of species have been undertaken by the industrial partner and one species has been prioritised by them for further assessment, while others are clearly not suitable. Thanks to our industrial partner experience this indicator is very likely to be met within the timeframe expected.

*0.6 A concrete strategy for implementing the Addis Ababa principles for the sustainable use of biodiversity, by eliciting pertinent traditional knowledge and incorporating into CITES decision-making processes, is defined and partially implemented by project end.*

During the first year, fieldwork activities and liaisons between the project team in Guatemala, CONAP and councils of elders have set up a resilient multi-stakeholder platform and initiated the elicitation of traditional knowledge. These processes are a concrete implementation of participative multi-level collaboration for the sustainable use of biodiversity, which is envisioned in the Addis Ababa principles. The existing platform and its collaborative processes can thus serve as a pilot model and starting point to develop operational guidelines that are transferable to sustainability assessments and management of CITES-listed species. The second and third TD workshops with the presence of all stakeholders to be held in 2020 and 2021 will provide opportunities to present the process and its outcomes to CONAP as the Authority charged with CITES implementation in Guatemala. The workshops will also provide opportunities to initiate discussions regarding the elements and shape of a concrete strategy for participatory processes, which will then be elaborated as part of the scientific documentation of the project.

In general, the measurable indicators are still adequate to evaluate progression towards the desired Outcome. The COVID-19 outbreak is a completely unforeseen Force Majeure, which has and will have an impact on the timeline agreed for the activities. Currently it is not possible to forecast how long this disruption will continue and therefore it is not possible to estimate whether the Outcome can be fully achieved. The Team will adapt to online resources but the field activities and the transdisciplinary dialogue will need to happen in person for the project to achieve all its goals. It may require some amendment requests once we have greater clarity over the situation. At this stage, we consider face-to-face meetings in Guatemala to be the best way forward, but this requires changes to the current travel restrictions.

### **3.4 Monitoring of assumptions**

#### **OUTCOME**

*Assumption 0.1: The polarized political climate in Guatemala still allows participation of all stakeholders under a Transdisciplinary format that fosters dialogues at equal footing.*

Comments: In spite of the change of government in January 2020, there is still political will to continue in the transdisciplinary dialogue.

*Assumption 0.2: Government authorities in charge of CBD-Nagoya and CITES remain dedicated to facilitate consensus building to overcome the temporal suspension of the Nagoya protocol and CITES implementation.*

Comments: Government authorities continue in their efforts to reach consensus to develop ABS mechanisms through instruments devised under the CBD's core articles. They have made it clear that restarting the debates around the Nagoya protocol in Congress is unlikely to take place and, if pushed, could contaminate positive advancement made by this project under new pathways of National policy. The project can reach the goals of this project independently of whether the Nagoya protocol is ratified or not. In fact, a great part of its importance lies in providing alternative avenues to develop ABS mechanisms for indigenous peoples' knowledge. The academic paper published in collaboration with other partners offers perspectives on what options there may be in the case of Guatemala

*Assumption 0.3: Organized indigenous Communities participating in the process remain open to dialogue with all other stakeholders and continue to actively participate in joint research efforts.*

Comments: Still holds true. The transdisciplinary process that respects the consuetudinary law referred to as "The Maya Protocol" has positively built trust among project partners.

*Assumption 0.4: The represented industry sector is capable of finding reasonable and viable avenues for access and benefit sharing for the Guatemala context and for indigenous groups in particular.*

Comments: still holds true. The information shared with the industrial partners until now have already sparked some interest.

*Assumption 0.5: Enough matching funding is allocated by project partners to secure newly identified and defined project activities derived from the dialogue and consensus-building process.*

Comments: Still holds true. Specifically, UVG has co-funded several field activities with the support of the InterAct Health project lead with the University of Zurich, also securing smaller private donations for the building of the Medicinal Plant Garden of the ACGERS Council in Poptun.

*Assumption 0.6: Legitimacy of the dialogue is reached/afforded by all stakeholder representatives at the onset of and during the project's development.*

Comments: Still holds true.

Assumption 0.7 (NEW): It will be possible to resume our fieldwork and regular meetings within the next four months (i.e. by September 2020)

## **OUTPUT 1**

*Assumption 1.1: The ethical approval will be granted (this process follows a Transdisciplinary (TD) approach solidly based on ethical approval consented by all partners, as well as y ethical approval by UVG and UCL's IRB procedures and/or the IRB representing government in Guatemala. It will also follow consuetudinary law as defined by Maya participants in the project, in order to ensure that design and implementation of project activities has the buy-in and ethical acceptance of all involved). We will be in a pre-campaign year for presidential elections, some IRB procedures within government might take longer than usual, or negotiations with Mayan authorities may take longer than planned.*

Comments: The ethical approval from UVG has not been obtained yet, due to Ethics Board delay in the appointment of a new IRB director. However, an official response requesting minor changes to the protocol was obtained in mid-April 2020, which makes us certain the final approval will be obtained no later than May 2020 (see explanation provided in Section 3.1 – Activity 1.2).

*Assumption 1.2: Upcoming electoral process in Guatemala half-way into the project does not hinder participation of government stakeholders into the project, nor does it polarize indigenous representatives in a way that prevents them from reaching consensus to participate in the entire project life.*

Comments: CONAP officials have not been changed and they maintained their involvement in the project, despite the change of government after the elections.

*Assumption 1.3: The constitutional court of Guatemala resumes the judicial process to restore the Nagoya protocol validity, or at least allows the national authority to implement joint research under approved CBD statutes.*

Comments: The government will not ratify the Nagoya protocol, given the political strife that can be caused by pushing it in Congress, but it is committed to developing alternative pathways for developing ABS mechanisms under CBD statutes and the development of specific national legislation.

*Assumption 1.4: CITES scientific authority of Guatemala, and CITES Secretariat in Geneva maintain priority on attending transdisciplinary roundtable.*

Comments: still holds true

*Assumption 1.5: All participants understand and value sustainable use of biodiversity as resulting from fair and equitable access and benefit sharing and integration of traditional knowledge into biodiversity assessment, monitoring and management.*

Comments: still holds true

## **OUTPUT 2**

*Assumption 2.1: Ethical approval is granted (is part of Output 1 but applies here too).*

Comments: see 1.1

*Assumption 2.2: CONAP grants all legal permits to academic partners and indigenous groups for plant collection.*

Comments: These permits have been obtained for 2019/2020 for academic partners, but the process to grant licenses to the Council are still being revised since December 2019. We are circumventing this problem by doing joint collection of UVG team with ACGERS members in all fieldtrips, using UVG licenses.

*Assumption 2.3: Maya healers continue to lead collaborative research for secure documentation of plant medicines and lead expeditions into habitats for their collection.*

Comments: Still holds true, even though every field activity is on stall because of the emergency measures taken by Guatemala in view of the COVID-19 outbreak.

*Assumption 2.4: Climatic conditions allow for the timely collection of full specimens (during flowering times) to facilitate process of species' identification.*

Comments: Climatic conditions did not impede precious collection trips, even though due to the COVID-19 outbreak two very important collection trips in March had to be postponed until the travel restrictions are lifted. Given there is no data for flowering periods of specimens, the UVG team is having a hard time finding most species in bloom. A total of 138 specimens have been collected up to date, of which only 20 have flowers. Full species identification is therefore compromised for the majority of specimens collected. Consequently, collection efforts will have to be doubled or tripled year-round in order to have a larger percentage of flowers in specimens. Given the budget does not allow for such an intervention, UVG has proposed to shift to bi-weekly exploration trips by trained Maya Ajilonel from ACGERS targeting specific plants in our lists, per region. This depends on indigenous partners obtaining licenses and on the COVID-19 quarantine being lifted.

## **OUTPUT 3**

*Assumption 3.1: Presence of species with commercial potential.*

Comments: still holds true, this point is based on an ongoing activity with the industrial partners.

*Assumption 3.2: The political climate does not hinder participation of industry in the consortium.*

Comments: Still holds true.

*Assumption 3.3: Communities and stakeholders agree on IP and ABS principle proposals.*

Comments: Still holds true.

*Assumption 3.4: The project consortium will identify an independent expert from academia or international policy arenas with demonstrated expertise in ABS policy and implementation processes, who will review the developed documents and guidelines for their adherence to pertinent international standards.*

Comments: Ian Thompson (an independent consultant with an expertise in the implementation of the NP) and Martin Hitziger from CITES are supporting the project by providing such expertise.

*Assumption 3.5: Key indigenous leaders adhere to commitments made within the TD stakeholders' platform and abstain from smearing campaigns which previously impeded advancing dialogues, such as the misinformation campaign of 2016 placing Nagoya regulations in the same law-package informally known as the "Monsanto" law (allowing benefits to multinational companies in detriment of small farmers), which generated great opposition.*

Comments: Still holds true. Our project partners are committed to this project. However, other indigenous leaders not currently in the partnership have requested to adhere to the initiative when discussing the policy implications in Y2. This needs to be carefully assessed to weigh risks and benefits.

#### **OUTPUT 4**

*Assumption 4.1: A satisfactory process of Outputs 1 and 2 is able to be transformed into direct actions for protection and increased availability of medicinal plant species selected as by indigenous healers and other stakeholders.*

Comments: Still holds true

*Assumption 4.2: Population adjacent to the medicinal garden site do not interfere with the establishment/extension of the garden.*

Comments: Still holds true

*Assumption 4.3: Data showing the value of natural capital for improving health in Maya communities is legitimate and recognized by project partners, allowing implementation.*

Comments: Still holds true

*Assumption 4.4: Enough funding is available to implement the main activities chosen by this consortium (TD platform).*

Comments: Delays in funding sent overseas to the UVG partner in Guatemala in 2019 put at risk the implementation of the project. This was circumvented by using a larger amount of complementary funding from the InterAct Health partner project in the first six months of the Green Health project, which reduced availability of matching funds for 2020. We are exploring additional sources of funding at national Guatemala levels in order to guarantee that all the additional research activities brought by the need to increment collection trips to catch flowering specimens, and extended periods of post-COVID-19 ethnography, can be met.

#### **OUTPUT 5**

*Assumption 5.1: Discussions and agreements on intellectual property rights of indigenous groups follow due-process as described in the CBD/NAGOYA and local TD table agreements during the course of this project and allow for the timely publication and dissemination of results.*

Comments: Still holds true

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

One species has already been preselected (Indicator 3.1, evidence file 3.1a, ), but it is too early to decide whether it holds the potential we anticipate. This project has been implemented over the last twelve months and it is too early to provide specific indicators or impact on biodiversity conservation.

The stakeholder meetings (Indicators 1.1, 1.2, 3.1, evidence file 1.1b), have increased the awareness of the opportunities of linking biodiversity conservation with R&D. The project aims to positively impact both biodiversity conservation and poverty alleviation of vulnerable indigenous groups through a strategy that creates positive feedback loops between the two components.

Petén lowlands have rapidly deteriorating ecosystems due to land-use change activities seeking rapid income generation. There continue to be few incentives to engage in conservation amidst immense poverty. The activities led by the local group of healers in the Petén showcase to the local population the importance of biodiversity conservation and offer a platform for discussing challenges to biodiversity locally. It is too early to have any documented evidence, but the number of reported treatments (evidence file 2.2a) provides indirect evidence.

Currently, there are no operational policy frameworks allowing for the creation of pathways for the sustainable use of biodiversity. This project provides evidence that, within its lifetime, could act as an incentive to reverse the trend (ongoing). Furthermore, traditional Q'eqchi' healers in the region that provide healthcare to up to 60% of the population, are having immense trouble accessing medicinal plants that are key to their treatments. We continue to gather evidence on these questions.

This project is built to support the currently stagnant implementation of the Nagoya protocol in Guatemala by working within provisions made within the CBD, in a platform that unites key stakeholders from government, academia, industry and indigenous peoples (Indicator 1.5). Core will be changes at government level especially CONAP and at this stage. It is too early to assess the impact of the change in government and at this stage there is no evidence for a change either way.

Additionally, the project will meet concrete demands of the ACGERS Council by developing a plant nursery and seed repository that will facilitate access to key medicinal species employed in the ethnomedicine of Q'eqchi' Ajilonel (healers). In addition, efforts to map the current location of plants collected in the forest will prompt the production of biodiverse-rich areas that can be presented to the local government and other key stakeholders for negotiating municipal and/or private protected areas (Indicators 3.1, 4.1, 4.2, 4.3; evidence file 3.5a).

## **4. Contribution to the Global Goals for Sustainable Development (SDGs)**

The project strongly supports SDG 3 (healthy lives and well-being for all), particularly by addressing access to traditional medicinal plants for the most marginal sector of society: impoverished indigenous populations. In the first year of the Green Health project we have created the baseline to document forest use in the ethnomedicine of the Q'eqchi' population, showing a high dependency on biodiverse-rich areas currently threatened. Initial inventories have been analyzed for the implementation of a medicinal plant garden that will increase access to key plant species used by traditional healers.

Green Health also addresses SDG 16 by promoting “just, peaceful, and inclusive societies” through offering those traditionally marginalized a mechanism to participate in the public policy domain. The Transdisciplinary platform created for this project testifies to the equal participation of the Q'eqchi' and Kaqchikel indigenous groups in the negotiations started with CONAP and other stakeholders.

The project also supports SDG 17, “revitalize the global partnership for sustainable development” through the concrete North-South TD platform between European and American

(NA, CA and SA) for strategic alliances in research and opening opportunities for benefit sharing.

## 5. Project support to the Conventions, Treaties or Agreements

Contribution to CBD: The first paper published with partial support through this project, uses a SWOT analysis in order to define what is needed to implement the Nagoya Protocol (NP) in the six countries assessed (Indicator 5.1, evidence file 5.2c). This analysis offers a solid basis for concrete improvements to implementing the objectives of these international agreements. It will require specific examples of species potentially to be developed to result in such outcomes. This is expected to be achieved by the end of the project. At this stage it directly feeds into ongoing discussions within CITES (see below).

More generally, the implementation of the provisions related to Indigenous Peoples and Local Communities (IPLCs) is recognized as one of the key challenges by the first assessment and review of the effectiveness of the NP, which was conducted by the CBD Secretariat in 2018. Recommendations include to build the capacity of Parties related to IPLCs, and of IPLCs with respect to ABS. This may include national mechanisms for the participation of IPLCs in the NP, coordination and institution building within and among IPLCs (e.g. through community protocols), and support to IPLCs for developing minimum requirements for mutually agreed terms and model contractual clauses.

Guatemala, with about 50% of the national population being indigenous, is a particularly challenged Party due to the fraught relations between these groups and national institutions. The implementation of the NP protocol in Guatemala has thus been particularly challenging, with no implementation processes in place, and the validity of the NP currently suspended by the constitutional court. Consequently, and despite the countries rich biodiversity resources and rich traditional knowledge associated to it, there currently are only two internationally recognized certificates of compliance published by the international ABS clearing house.

In the run-up to this project, four CBD focal points the Guatemalan competent authority (CONAP) were involved in several personal meetings with Dr. Monica Berger, and in regular follow-up by phone. Two specialists of CONAP's unit on indigenous affairs were assigned as permanent representatives of CONAP to the project (evidence file 1.1f). They participated in the first transdisciplinary workshop held in 2019 (Indicators 1.1, 1.2, evidence files 1.1b, 1.3a), and will participate in the second such meeting that was to be held in June 2020 but needs to be rescheduled due to the COVID-19 emergency. Around these two workshops, further meeting between the projects European and overseas representatives and CONAP executives will be held to discuss policy issues. The inclusion of CONAP in project discussions thus builds capacity related to IPLCs. Throughout the first year of the project, discussions between Q'eqchi' representatives and the project team, in particular Dr. Berger, have been conducive to elicit concerns of indigenous people regarding ABS, and aided the Q'eqchi' representative's understanding of CBD and ABS processes.

As per what was meant to be the workshop in early June 2020 (to be rescheduled), discussions on policy implications of fieldwork processes will commence between CONAP and UCL, and also benefit from the support of NP implementation expert Ian Thompson. These discussions will centre on national mechanisms for the participation of IPLCs in the NP, encompass the development of community protocols with the Q'eqchi', and result in minimum requirements for mutually agreed terms (Indicator 3.1). Initial fieldwork during the first year is a crucial precondition for these efforts, since it strengthened networks between the project team, CONAP and the Q'eqchi', and gathered key information that serves as case studies for policy relevant project work packages (Indicators 2.1, 2.2, evidence file 2.2a, folder 2.3a).

Contribution to CITES: The CITES Secretariat, via Martin Hitziger, is participating in most discussions of the project core team, and Martin Hitziger will attend the second transdisciplinary workshop scheduled for after June 2020 (depending to the current travel restrictions). Therefore, CITES participation in this project increases the understanding of CITES staff of access and benefit sharing and CBD provisions, and of an exemplary case study of participative research and transdisciplinary collaboration that involves traditional and indigenous knowledge of biodiversity. Decisions of the recently held 18<sup>th</sup> meeting of the CITES Conference of Parties request such methods for guidance on sustainability assessments (‘non-

detriment findings', Decisions 18.132 - 134), for enhanced engagement of rural and indigenous communities in CITES processes (Decisions 17.57 (Rev. CoP18), 18.31 - 18.32), to ensure livelihood benefits from protection of and commodity trade in biodiversity (Decisions 18.,33 - 18.37), as well as improved CITES implementation for medicinal and aromatic plant species (Decision 18.300 - 303). Therefore, insights derived from the collaborative process implemented in this project will be one of manifold inputs to the Secretariat's reporting to the 25<sup>th</sup> meeting of the CITES Plants Committee, which is scheduled for July 2020.

In Oct 2019, with additional funding obtained through UCL's Global Engagement Office (<https://www.ucl.ac.uk/global/strategy>), a stakeholder meeting with partners from some of UCL target countries in Southern America (Mexico, Chile, Colombia, Peru) could be organised, which raised awareness among stakeholders in the UK and the participating institutions.

## **6. Project support to poverty alleviation**

The project will alleviate poverty through a) a direct mechanism measurable within the life of this project and (b) a direct mechanism not measurable within the life of this project (b):

- a. The medicinal plant garden implemented will be run by women who are members of the Association using a model previously implemented by the Q'omaneel association in San Juan La Laguna (Berger et al., 2006). In this model, the women tend to the garden in shifts and receive a salary. The salary is paid by income generated through i) the sale of medicinal plants to the surrounding communities and ii) a complementary strategy of community-based tourism around medicinal plant knowledge, linked by the Ajilonel men of the association in an alliance with the local tourism sector. Given that the plant nursery will be only minutes away from a strong tourism sector that comes to ancient archaeological sites in the area, initial agreements are being made to develop and sell "experiences" to tourists. This model has successfully been implemented in San Juan La Laguna, Chimaltenango, Patzun and many other areas by one of the UVG members in the consortium. In this way, the garden can not only guarantee access of key medicinal plants to healers, but can also generate income for women and men through complementary activities (for the model see <http://www.turismodespierto.com/2018/07/el-turismo-asociativo-de-la-etnia-maya-tzutujil> ). In the Year 1 of the Green Health no income has yet been generated. It is expected that by the last month of the project, in Y3, initial income may already be possible.

Evidence of progress: Garden progress report file 3.5a

- b. The ABS mechanisms being developed will yield concrete opportunities for a contract between Indigena Biodiversity Ltd and the ACGERS council. However, the period of time to see one of such agreements turning into measurable income for the Q'eqchi', will most likely materialize after the conclusion of this project.

## **7. Project support to gender equality issues**

The project is actively impacting gender equality at two levels. Firstly, gender equality is being promoted at the level of leadership positions within the Steering Board of the TD platform, making a point to reach as close to 50% as possible. Currently the Board is integrated 46% by women (Indicator 1.1, file 1.3a), with no female representation on behalf of the Maya Council of Elders or the Maya University. After explaining gender equity to indigenous partners, they agreed to invite and appoint a midwife to the Board in the next meeting of the steering committee (to be held post COVID-19). Secondly, the project is actively promoting the involvement of women in the project at the community level. In the first meetings with the Council only men participated, relegating women to kitchen activities for making food for male participants. After addressing needs to have this project be more inclusive of women, the Council proposed that all women in the families of the Q'eqchi' Council interested, would form a group to receive training as midwives and to tend to the medicinal plant garden. This training took place in May 2019 (evidence folder 2.1d). These women are now officially participating in the overall project activities in Poptun and elected two representatives to participate in the Health Commission of the ACGERS Council.



Also, all main junior researchers funded directly through the project (most notably Monica Berger-Gonzalez and Francesca Scotti as well as other junior staff at UVG) are female.

## **8. Monitoring and evaluation**

The logframe of the project presented careful indicators against which to measure outputs and activities, showing directly how these relate to Outcomes. We have presented in great detail in the prior sections how these are indicators of objective advancement of the Green Health project. Our monitoring mechanism has to be very specific because of the Transdisciplinary platform. When looking carefully at the operational plan stemming from the kickoff meeting, one can see that each activity has appointed responsible parties (see file 1.3b). These responsibilities are checked every semester by members of the steering board to discuss needed adaptations. Monthly activities are scheduled and supervised by UVG staff given that cash flow from the administration unit in charge of the grant funds requests careful fieldwork plans in order to allocate funds per activity. Additionally, the academic partners from UCL and UVG created an internal document with a timeline and responsibilities to track the operational advances of the project. Official evaluation of the overall project will be conducted by the partner of CITES using a specific methodology, upon request of the PI.

## **9. Lessons learnt**

Administrative Level:

The late arrival of funds to the Guatemalan partners was due to delays in the setting up of the agreements between the partners and DEFRA, but also delays in the internal arrangements of both academic partners. It is also linked to the delayed start date and the complexities of setting up the relevant agreements, caused internal tensions given that many researchers had to work without a contract for up to six months in order to uphold the tight fieldwork schedule, with UVG having to approve late internal loans that increased bureaucratic procedures for the team. As a consequence of a one-month delay in the start of the funding only UCL but not UVG requested a contract amendment, due to concerns about internal administrative problems at UVG. However, in the end this resulted in some administrative challenges at UVG. These required hiring extra personnel in Guatemala and finding students that worked voluntarily in order to complete all Year 1 activities one month earlier. The COVID-19 situation further compromised three weeks of key research for plant collection activities (see “Impact of COVID-19 on green Health activity” provided in Annex 4).

The delay in fund transfer caused a severe disruption in the planned cash flow for adhering to operation plans and fieldwork activities in Guatemala. The only way to save the situation was to request consultants to work without a contract and to fund activities from complementary funds of another project held between UVG and Zurich University. This situation caused some mistrust among indigenous consultants from the regions of study who had a hard time working without a salary paid at the end of each month. However, these situations triggered open discussions led by the anthropologists in UVG, who helped build trust by openly discussing administrative and financial stress being endured by all project partners. The prior bonds of trust held between the Council and Dr. Berger helped solve the situation and triggered a solidarity fund that supported team members by allowing them to borrow funds for special and urgent needs. As a recommendation to other projects working in delicate social contexts: disruption of the cash flow can hinder a project’s rapport with minorities because they are expecting to be treated unfairly according to historical trauma, so back up emergency funds should be a pre-condition when working in North-South settings. These should not only fall on the shoulders of the Southern partner (in this case UVG), but should be shared by partners in the UK.

Management Level:

Assigning specific roles to each team member in a participatory manner has facilitated monitoring advancement of activities, reporting changes in order to adapt to new situations, and tracing products associated to indicators for reporting. The decision to have the UVG team manage Guatemalan activities independently of UCL using their normal planning & execution platform, has kept all activities on track and to rapidly manage changes needed. The lesson

learned is that trust and responsibility seem to be enhanced when there is no excessive micromanagement working in N-S partnerships.

Working on this international collaboration has brought each member of the team to acknowledge the complexity in terms of interactions and communication. The development of the research, and its implantation as such, posed very limited challenges. On the other hand, developing adequate communication structures, understanding different administrative procedures and organising the legal administrative part required considerable investment in time and effort. Establishing trustful relationships and team building within this international team is ongoing, especially as it relates to understanding and overcoming mutual misconceptions not only personal and cultural, but also about procedures and protocols. It is easy to do plant inventories. It is complicated to communicate about the processes needed. Disagreements between partners have arisen and were discussed openly as this is the best way to overcome them. Communication via electronic media has important limitations and most of the discussions could easily be resolved during face-to-face meetings.

Technical Level:

Our understanding that communication is a key factor in complex transdisciplinary settings has been reinforced. Consequently, measures have to be carefully implemented to guarantee that no disparities are induced when working across cultures and languages. Investing in on-site translations in all languages needed at the same time, has improved the ability to communicate at equal footing (the kick-off meeting had a Q'eqchi'-Spanish and an English-Spanish translation booth). It also improved the planning of activities and reaching agreements all could understand.

General:

We are in an ongoing fast change of the research environment resulting from the current pandemic. This has required a range of modifications at all levels, but importantly relating to communication and we will need to adapt the project further also based on the government regulations in the UK and Guatemala.

## **10. Actions taken in response to previous reviews (if applicable)**

NA

## **11. Other comments on progress not covered elsewhere**

There is no project-specific risk, but the current global Force Majeure situation will result in changes to the planned schedule.

## **12. Sustainability and legacy**

The project has kept a low profile, so far, at the National Guatemalan level at the request of CONAP authorities, who fear the history of conflict associated to the Nagoya ratification may harm this collaboration. So far, all meetings have been kept within the institutional borders of the partners conforming the transdisciplinary process. Specific request by other indigenous groups to be included in the dialogue have been kept marginal. The strategy negotiated between partners is to open up participation and visibility towards the end of the project, when most of the Q'eqchi' field activities are completed and pathways for ABS mechanisms are advanced. In this way, the project can already show results as a case study that can positively impact scepticism or direct opposition of other sectors. The project partnership discussed at one point making the policy dialogue more ample, but several local think tank directors recommended at the kick-off meeting of 2019 to keep a low profile at the beginning and open the platform only when the main outputs were achieved. Local interest is strong, so we are certain that upon opening communication to a wider audience there will be increased participation and impact. This is to become the first 'proof of concept' project showing evidence

of an ABS pathway that can benefit traditionally marginalized indigenous populations, which is a hot topic of great interest in Guatemala's current policy arena.

The project has a commitment to promote Open Access to the project activities and results, not only through academic formats such as conference presentations and academic publications, but also in lay publications for wider audiences. At present, a short film is being produced that describes the Green Health project's TD platform and goals, to be shared with a more ample audience.

So far, our exit strategy is still valid, although it is evident that there are sectors interested on continuing investing in the scalability and replicability of the project's outcomes.

### 13. Darwin identity

The project was highlighted on UCL's news website (Pharmacy, as the first bilingual news item; see <https://www.ucl.ac.uk/pharmacy/news/2019/may/plants-and-health-how-achieve-equitable-access-and-benefits>), it has been tweeted by UCL School of Pharmacy and has feed into internal discussions at UCL about the implementation of the NP (<https://www.ucl.ac.uk/research/integrity/nagoya-protocol>) and UCL's wider South-North links (in the context of UCL's Global Engagement Office).

In Guatemala, the UK government was approached through the UK embassy. The project was presented to two of their project officers and one of them participated in the kick-off meeting of 2019, offering to support communication mechanisms when requested.

We maintain a Twitter account (@HealthDarwin) where the Darwin Initiative funding is mentioned in the profile description, we tweeted about Darwin's website, initiatives and newsletter.

Submitted papers acknowledge Darwin funding, as well as each presentation or poster, either in writing or through the display of the Darwin logo.

Martin Hitziger will use the project (with the relative acknowledgement of support and funding from the Darwin Initiative) during a summer school he is teaching in August 2020 as one of several case studies on knowledge integration. The summer school is convened by the network of German federal scholarship institutions for talented students.

Aspects of Darwin work will contribute to documents that will be submitted to the CITES Plants Committee scheduled to take place in July 2020.

### 14. Project expenditure

**Table 1: Project expenditure during the reporting period (1 April 2019 – 31 March 2020)**

Project spend (indicative) since last annual report	2019/20 Grant (£)	2019/20 Total Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)				
Consultancy costs				
Overhead Costs				
Travel and subsistence				Due to COVID-19 some activities had to be cancelled (see below for info)
Operating Costs				
Capital items (see below)				A computer has been purchased (see below for info)
Monitoring & Evaluation (M&E)				

Others (see below)				
<b>TOTAL</b>				

The changes have not yet been discussed with Darwin. An urgent change request form, with thorough explanations, is being submitted at the same time as the Y1 report.

The last Change request was submitted in December 2019. Since then, there were some unforeseen dramatic developments (Force Majeure). Normal activities were planned mid Feb, from then on we entered a time of uncertainty and planned costs for March 2020 could not be expended due to the pandemic. This includes costs to travel to the Peten (fieldtrips) and for the transdisciplinary workshop. As a consequence, there is an underspend in the Travel budget. For what concerns Staff costs, UVG had planned to readjust salaries in the last two months of this financial year, in order to compensate for the late arrival of the funds at UVG; however, this proved impossible under the current situation.

Due to major unforeseen IT problems, in Feb 2020, the UVG Team had to purchase a computer last minute to continue the research activities. While we acknowledge that this was not in the agreed budget, it was essential to keep the project going. The Team at UVG had no other funds to cover for this expense.

## Annex 1: Report of progress and achievements against Logical Framework for Financial Year 2019-2020

Project summary	Measurable Indicators	Progress and Achievements April 2018 - March 2019	Actions required/planned for next period
<p><b>Impact</b></p> <p>Guatemala's national policies related to ratified international conventions for biodiversity protection and access/benefit sharing are strengthened and have operational implementation mechanisms inclusive and respectful of indigenous people's knowledge and priorities.</p>		<p>A process of negotiation between policy makers and indigenous representatives has been started, facilitated by the project partners from industry, academia and the international cooperation sector, that have set the foundations for developing an ABS framework within the CBD as part of a national policy effort.</p>	
<p><b>Outcome</b></p> <p>Implementation framework for sustainable use, access and benefit-sharing in Guatemala involving consensus between indigenous groups, government, academia and industry, based on natural capital and traditional knowledge to sustain healthy livelihoods.</p>	<p>0.1 Participation of indigenous people within the project increased by at least 40% in relation to prior similar initiatives led by CONAP. Of these, by the project end, at least one fourth are women.</p> <p>0.2 A multi-stakeholder, transdisciplinary process to foster dialogue at equal footing between government, academia, industry and indigenous communities has resulted in a new framework of collaboration by project end and is documented for replication.</p> <p>0.3 New scientific information on indigenous Maya medical knowledge and on the relevance of natural capital to sustain healthy livelihoods (ethnography and plant collections in herbarium) based on collaborative research is produced by the end of the project.</p> <p>0.4 Maya healers have increased access to medicinal plants by at least 20% more through biodiversity protection initiatives in the study area</p>	<p>0.1 Registered participation in project meetings, conformation of steering board by gender and ethnicity – this has been achieved, in the way and with the conformation planned</p> <p>0.2 Signed cooperation agreement by all project partners, meeting reports, final written publication of the process in the form of manual and tools – the agreement has been signed, meeting reports are available.</p> <p>0.3 Digital ethnographic reports, plant collections in UVG herbarium, reports of identified species shared with CONAP, UCL and UVG – ethnographic reports are available with the most recent collected data, collected specimens are being identified and a botanical database is being kept updated. Initial reports have been shared between UCL and UVG.</p> <p>0.4 A report on the number of species accessible from Year 1 (baseline) and a final report in Year 3, per healer in each area, which can be compared –</p>	<p>0.1 Steering board meetings will continue throughout the project as they are a fundamental part of the TransDisciplinary process that drives this project. Some meetings will be managed virtually, in response to the COVID-19 emergency but workshops and training will have to be run in person.</p> <p>0.2 Ethnographic reports will be produced based on the findings.</p> <p>0.3 UVG Herbarium will do more collection trips (as delayed due to COVID-19) and will continue identification of specimens.</p> <p>0.4 No action planned for the next period</p> <p>0.5 The industrial partner will produce a proposal for ABS which will be discussed among the TD Board.</p> <p>0.6 No action planned for the next period</p>

	<p>by year 3, as evidenced through local repositories of biodiversity and knowledge about them.</p> <p>0.5 A concrete strategy for benefit sharing opportunities for indigenous groups is defined and ready for implementation by project end.</p> <p>0.6 A concrete strategy for implementing the Addis Ababa principles for the sustainable use of biodiversity, by eliciting pertinent traditional knowledge and incorporating into CITES decision-making processes, is defined and partially implemented by project end.</p>	<p>the baseline has been established for the species collected.</p> <p>0.5 Report by Indigena Biodiversity Ltd. (in English and Spanish) - The industrial partner has started the evaluation of the commercial potential for some species.</p> <p>0.6 Report on guidelines for operationalization of the Addis Abbeba principles for traditionally used medicinal species are elaborated (in English and Spanish) – no progress.</p>	
<p><b>Output 1.</b></p> <p>Policy Framework: an implementation framework for a policy on biodiversity and ABS is developed through a dialogue between government , local indigenous groups , academia and industry , which could break down barriers and misunderstandings that have opposed the ratification of Nagoya, and serve as a basis for future research collaboration on traditional medical Maya knowledge, sustainable use of biodiversity, intellectual property recognition and other forms of benefit sharing.</p>	<p>1.1 The appointed/elected TD steering board with at least 30% women and 25% indigenous leaders is active by month 3</p> <p>1.2 Dialogues and achieved agreements on project objectives based on at least 2 TD meetings per year starting from year 1, where European collaborators will be expected to take part in person once a year; any additional meeting will be joined via proxy, using conference calls</p> <p>1.3 Production of a policy draft for ABS, reviewed by an independent ABS expert by month 18.</p> <p>1.4 Ethical approval is completed in academia, government and Indigenous</p>	<p>Indicator 1.1 Achieved – MOV 1.1 evidence mentioned in section 1.3 of report (provided in Annex 3)</p> <p>Indicator 1.2 Ongoing, two TD workshops were successfully conducted – MOV 1.2 evidence mentioned in sections 1.1, 1.3, 1.4 and 1.5 of report (provided in Annex 3)</p> <p>Indicator 1.3 (MOV 1.4) Action to be taken in the next period</p> <p>Indicator 1.4 IRB protocols have been submitted in a timely manner and approval has been obtained by the Maya council, while UVG approval was delayed as outlined in section 1.2 of report; finally feedback was obtained in April 2020 (minor changes) and the protocol was resubmitted, currently awaiting approval. MOV 1.3 evidence mentioned in sections 1.2 of report (provided in Annex 3)</p> <p>Indicator 1.5 Action to be taken in the next period</p>	

	<p>consuetudinary practice and is approved by month 8.</p> <p>1.5 Stakeholder's agreement on the guidelines for accessing traditional ecological knowledge for sustainability assessments (NDFs), monitoring and management of biodiversity by month 24</p>		
<p>Activity 1.1</p> <p>A 'round table' comprising all relevant stakeholders to sign a cooperation agreement for the project's duration, following a TD format.</p>		Completed	Completed
<p>Activity 1.2</p> <p>Writing and submission of IRB protocols for UK, Guatemala and Maya Council.</p>		Almost complete	Awaiting official endorsement from UVG
<p>Activity 1.3</p> <p>Appointment/election of a TD steering board constituted by at least 30% women and 25% indigenous leaders, signing of MOU with operational plan for year 1.</p>		Completed	Completed
<p>Activity 1.4</p> <p>Steering board meetings are conducted to discuss the development of the framework with all stakeholders (including preparation of materials for discussion).</p>		Ongoing	Meetings will continue throughout the project. Our latest TD workshop had to be rescheduled due to the COVID-19 emergency (potentially for Nov 2020).
<p>Activity 1.5</p> <p>Conduction of eight TD workshops for discussion and negotiation of components for implementing Addis Ababa's principles and Nagoya.</p>		Ongoing	
<p>Activity 1.6</p> <p>Drafting of procedural protocols for inclusive application of Addis Ababa principles in sustainability assessments (NDFs), monitoring and management of medicinal plant resources.</p>		Not scheduled for this period	Not scheduled for the next period but M. Hitziger from CITES will be starting drafting the protocols in Y2Q4
<p>Activity 1.7</p> <p>Production and dissemination of procedural tools (manuals and documents) for implementing Guatemala's Nagoya protocol including the proposed ABS pathways for Guatemala and Q'eqchi' participating communities.</p>		Not scheduled for this period	Not scheduled for the next period
<p><b>Output 2.</b></p>	<p>2.1 General list of most used plants and ethnomedical bibliographic</p>	Indicator 2.1 The list is being compiled, in line with updates from the epicultural booklets and the herbarium identified specimens	MOV 2.1 Evidence mentioned in

<p>Information Collection: ethnomedical body of information on selected Maya phytomedicine is produced.</p>	<p>research (including safety assessment) is completed by year 2.</p> <p>2.2 A minimum of 25 patient cases are researched through ethnography and traditional Maya medical treatment comprehensively documented by month 24.</p> <p>2.3 Plants collection, identification and cataloguing is completed by year 2 (the number of species collected cannot be specified prior to case studies completion).</p>	<p>section 2.5 of report (and provided in Annex 3) MOV 2.3 Evidence mentioned in section 2.6 of report (and provided in Annex 3)</p> <p>Indicator 2.2 Epicultural booklets have been compiled by the healers, providing a collection of case studies. Selection of cases to investigate further is being undertaken and will continue in the next period MOV 2.2 Evidence mentioned in section 2.2 and 2.3 of report (and provided in Annex 3). Additionally, all of the booklets and recordings are available on request.</p> <p>Indicator 2.3 Ongoing. Evidence mentioned in section 2.5 of report (and provided in Annex 3)</p>	
<p>Activity 2.1 Organisation of community meetings via AGERS Council to present project details to elders, individual enrolment of healers, creation of participants' list within Maya ceremonial protocol.</p>	<p>Completed</p>	<p>Completed</p>	
<p>Activity 2.2 Initial ethnographic research of most-common referred plant lists per ailment (syndromic and cultural ailments).</p>	<p>Completed</p>	<p>Completed</p>	
<p>Activity 2.3 Participatory observation, interviews and focus groups to build up medical case studies.</p>	<p>Ongoing</p>	<p>As soon as activity resumes after the COVID-19 emergency selection of case studies for follow up will continue and will be completed by the end of Y2.</p>	
<p>Activity 2.4 Analysis of the ethnomedical and ethnobotanical data to assess how gender, age and socio-cultural background affect access and use of medicinal plants.</p>	<p>Ongoing</p>	<p>As soon as data gathering is completed (depending on time of recovery from COVID-19), data analysis will start</p>	
<p>Activity 2.5 At least 90% of plants used by the healers in the medical case studies are collected, deposited and identified at UVG herbarium.</p>	<p>Ongoing</p>	<p>Collection trips have been delayed into Y2 due to late blooming species and COVID-19 emergency preventing 2 trips in March. Herbarium activities are on halt during the emergency, therefore in the next period more collection trips will take place and identification of plants as well.</p>	
<p>Activity 2.6</p>	<p>Ongoing</p>	<p>In parallel to the further identification of specimen from the herbarium,</p>	



<p>Integration of academic knowledge on the species collected through literature research on traditional uses, toxicological and pharmacological assessment (safety and efficacy) based on bibliographic evidence.</p>		<p>collection of published knowledge will continue in the next period</p>
<p>Activity 2.7 Production of maps highlighting areas of medicinal plant diversity, risk assessment and proposed areas for protection.</p>	<p>Not scheduled for this period</p>	<p>This activity can only take place towards the end of the project, starting towards the end of Y2</p>
<p><b>Output 3.</b> Access and Benefit Sharing Proposal: proposal for access and benefit sharing and protection of intellectual property, based on mutually agreed terms, coordinated by the industrial partner, and reviewed by an independent ABS expert (to be coordinated by M. Hitziger).</p>	<p>3.1 Stakeholders' agreement on the proposal for benefit sharing (including non-monetary benefits relevant to local priorities), in the event that a commercial product is developed, by the end of month 20 and indigenous community approval by month 24.</p>	<p>Indicator 3.1 Information on the species is being shared with the industrial partner (following updates from the herbarium) who has started the evaluation of the commercial potential for the first species. The proposal for benefit sharing is due to be drafted in the next period MOV 3.1a Evidence is mentioned in section 3.1 of report (and provided in Annex 3)</p>
<p>Activity 3.1 Sharing information on medicinal species (from Output 2) with industrial partners and identification of species with commercial potential, protectable by IP rights.</p>	<p>Ongoing – information on medicinal species is being shared with the industrial partner</p>	<p>Information sharing will continue in parallel to updates on identified species (from herbarium), considering that activities had come to a halt, it is possible that this activity will take extra time. In the meantime, it is possible to work with the material already available, without jeopardising delivery</p>
<p>Activity 3.2 Selection of 1 or 2 plants from the list produced by the industrial partners in 3.1 that will be used as a proof of concept.</p>	<p>Ongoing – evaluation of commercial potential of medicinal species has started</p>	<p>This activity will continue and the species will be selected in the next period. As mentioned above it is possible that this activity will take extra time. In the meantime, it is possible to work with the information already available, without jeopardising delivery.</p>
<p>Activity 3.3 Stakeholders meetings/workshops lead by the industrial partners to build a model ABS agreement.</p>	<p>Ongoing - a workshop to discuss the building of the ABS agreement was scheduled for early June 2020, but it had to be rescheduled for later in 2020 (date unknown) and therefore the</p>	<p>The workshops on this topic will take place in the next period and an ABS model will be developed during such workshops and remote discussions</p>

		relative preparation and discussions will be delayed.	
Activity 3.4 Workshops to present the model agreement to the broader indigenous groups to facilitate consensus and agreement on potential pathways to benefits.		Not scheduled for this period	Once drafted and agreed on by the stakeholders, the model will be presented to the broader indigenous community, during a TD workshop. This will take place towards the end of Y2, considering the potential delays mentioned earlier.
Activity 3.5 Stakeholders' meetings to discuss examples of non-monetary benefits of interest to the communities involved or propose new ones.		The Q'eqchi ACGERS community has already discussed with the stakeholders the non-monetary benefits, in the form of a local medicinal garden (and seed repository) to be led and managed by their community. This garden and its facilities are currently being prepared	Garden building will continue
<b>Output 4.</b> Local Framework: improved (from baseline) and sustainable access and availability of key medicinal plants for indigenous healers/communities based on locally defined strategies and terms, ensuring equal participation of women	4.1 The number of species to which individual healers have direct access by the end of year 3 is increased by at least 20% in relation to the baseline at the onset of the project.  4.2 Participation in medicinal garden cultivation and management is over 50% by knowledgeable women by the end of year 3.  4.3 A municipal proposal for potential implementation of one protection area still holding biodiversity of medicinal plants is drafted by month 22 and evaluated and potentially agreed by the government by year 3.	Indicator 4.1 The baseline of access has been established, but increased access cannot be calculated until the end of the project. Though, through the construction of a medicinal garden (which already started), access to certain species will be increased MOV 4.1 Baseline is being measured as walking time Evidence mentioned in section 4.1 of report (and provided in Annex 3) – collection trips have not been completed yet, due to COVID-19 shut down, so further location data will be collected as soon as activities resume in Guatemala.  Indicator 4.2 not scheduled for this period  Indicator 4.3 not scheduled for this period	
Activity 4.1 Establish the baseline of access and availability of medicinal plants to the healers		Ongoing – the baseline has been calculated as walking distance (time) from healers' households.	Some plant collection trips have been delayed due to the emergency measures for COVID-19 and therefore in the next period remaining information on baseline will be collected.
Activity 4.2		Not scheduled for this period	Agreement on a list of key species to plant will be obtained through local

Consensus meeting with ACGERS Council elders to choose local options for assisted (artificial) reproduction of key species		meetings of the healers, starting the list produced by the result of Output 2.
<b>Activity 4.3</b> Creation of medicinal plant gardens and seed repository (following technical assessment of the areas, suggested by ACGERS, and adaptation needs for reproduction of selected species).		Not scheduled for this period but ongoing – the garden is currently being developed, the land is available, a small warehouse and office has been built, an engineer visited the site to prepare a blueprint
<b>Activity 4.4</b> Planting of selected species in the gardens and disseminated via seed and seedling exchange (based on the assessment in 2)		Based on the plant list compiled by a consensus of healers, seeds will be planted in the garden, towards the end of Y2, when the garden will have started being operational.
<b>Activity 4.5</b> Organization, training and supervision of women that will be tending/managing the garden.		As the construction of the garden proceeds, the Q'eqchi' women of that community will be trained in garden maintenance and management, through locally-led workshops.
<b>Activity 4.6</b> Meetings for the identification of biodiversity-rich areas (including key medicinal plants) that could be targeted for protection (GIS mapping).		This activity will take place in Y3
<b>Activity 4.7</b> Discussion with government officials on the feasibility of the creation of protected areas with presentation of mapped areas.		This activity will take place in Y3
<b>Output 5.</b> Dissemination: dissemination of the project's results and strengthening of the national dialogues on biodiversity and traditional knowledge. The dissemination will include CBD processes.	5.1 At least five academic papers published (Open Access) addressing key findings of project components by project end.  5.2 Online and printed publication of tools developed via the TD process in the form of a manual, to foster replication by project end.  5.3 Lay publications for stakeholders use according to strategy defined jointly by TD table by project end.	Indicator 5.1 One first paper has been submitted and accepted with minor revisions to Frontiers in Pharmacology, others dedicated to the project methodology and results will be drafted in the following periods MOV 5.1 Evidence mentioned in section 5.2 of report (and provided in Annex 3)  Indicator 5.2 not scheduled for this period.  Indicator 5.3 not scheduled for this period  Indicator 5.4 not scheduled for this period

	<p>5.4 At least one video documenting the process of the stakeholders' dialogue to develop the project, and one on research outcomes (traditional medical knowledge and biodiversity protection).</p> <p>5.5 At least two presentations at international conferences relevant to the ABS processes (CITES, CBD, and/or academic)</p>	<p>Indicator 5.5 Two abstracts have been submitted for international conferences in 2020 MOV 5.5 Evidence mentioned in section 5.4 of report (and provided in Annex 3)</p>	
<p>Activity 5.1</p> <p>Writing of lay publications regarding process (replication) and outcomes (communities' information process), dissemination in digital and printed forms.</p>		<p>Not scheduled for this period</p>	<p>This activity is more likely to take place in the last phase of the project, even though it will be initiated during negotiations</p>
<p>Activity 5.2</p> <p>Writing of academic papers.</p>		<p>Ongoing, one first paper on ABS in Latin America has been submitted, currently awaiting feedback.</p>	<p>Further papers will be drafted, in regards to results and methodology of this project.</p>
<p>Activity 5.3</p> <p>Production of videos and dissemination in online-formats.</p>		<p>Ongoing, videos of the interviews are being recorded and are available on request.</p>	<p>Further videos will be recorded for other patient case studies. All videos will be edited prior to dissemination</p>

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

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p><b>Impact:</b> Guatemala's national policies related to ratified international conventions for biodiversity protection and access/benefit sharing are strengthened and have operational implementation mechanisms inclusive and respectful of indigenous people's knowledge and priorities.</p>			
<p><b>Outcome:</b></p> <p>Implementation framework for sustainable use, access and benefit-sharing in Guatemala involving consensus between indigenous groups, government, academia and industry, based on natural capital and traditional</p>	<p>0.1 Participation of indigenous people within the project increased by at least 40% in relation to prior similar initiatives led by CONAP. Of these, by the project end, at least one fourth are women.</p> <p>0.2 A multi-stakeholder, transdisciplinary process to foster</p>	<p>0.1 Registered participation in project meetings, conformation of steering board by gender and ethnicity.</p> <p>0.2 Signed cooperation agreement by all project partners, meeting reports, final written publication of the process in the form of manual and tools.</p>	<p>- The polarized political climate in Guatemala still allows participation of all stakeholders under a Transdisciplinary format that fosters dialogues at equal footing.</p> <p>- Government authorities in charge of CBD-Nagoya and CITES remain in their</p>

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p>knowledge to sustain healthy livelihoods.</p>	<p>dialogue at equal footing between government, academia, industry and indigenous communities has resulted in a new framework of collaboration by project end and is documented for replication.</p> <p>0.3 New scientific information on indigenous Maya medical knowledge and on the relevance of natural capital to sustain healthy livelihoods (ethnography and plant collections in herbarium) based on collaborative research is produced by the end of the project.</p> <p>0.4 Maya healers have increased access to medicinal plants by at least 20% more through biodiversity protection initiatives in the study area by year 3, as evidenced through local repositories of biodiversity and knowledge about them.</p> <p>0.5 A concrete strategy for benefit sharing opportunities for indigenous groups is defined and ready for implementation by project end.</p> <p>0.6 A concrete strategy for implementing the Addis Ababa principles for the sustainable use of biodiversity, by eliciting pertinent traditional knowledge and incorporating into CITES decision-making processes, is defined and partially implemented by project end.</p>	<p>0.3 Digital ethnographic reports, plant collections in UVG herbarium, reports of identified species shared with CONAP, UCL and UVG.</p> <p>0.4 A report on the number of species accessible from Year 1 (baseline) and a final report in Year 3, per healer in each area, which can be compared.</p> <p>0.5 Report by Indigena Biodiversity Ltd. (in English and Spanish).</p> <p>0.6 Report on guidelines for operationalization of the Addis Ababa principles for traditionally used medicinal species are elaborated (in English and Spanish).</p>	<p>current efforts to facilitate consensus building to overcome the temporal suspension of the Nagoya protocol and CITES implementation.</p> <ul style="list-style-type: none"> <li>- Organized indigenous Communities participating in the process remain open to dialogue with all other stakeholders and continue to actively participate in joint research efforts.</li> <li>- The represented industry sector is capable of finding reasonable and viable avenues for access and benefit sharing for the Guatemala context and for indigenous groups in particular.</li> <li>- Enough matching funding is allocated by project partners to secure newly identified and defined project activities derived from the dialogue and consensus-building process.</li> <li>- Legitimacy of the dialogue is reached/afforded by all stakeholder representatives at the onset of and during the project's development.</li> </ul>
<p><b>Output 1</b></p> <p>Policy Framework: an implementation framework for a policy on biodiversity and ABS is developed through a dialogue between government , local</p>	<p>1.1 The appointed/elected TD steering board with at least 30% women and 25% indigenous leaders is active by month 3</p> <p>1.2 Dialogues and achieved</p>	<p>1.1 Signed document by all project partners of the TD process.</p> <p>1.2 A. Minutes from steering board constitution. B. Minutes from all meetings held</p>	<ul style="list-style-type: none"> <li>- The ethical approval will be granted (this process follows a Transdisciplinary (TD) approach solidly based on ethical approval consented by all partners, as well as y ethical approval by UVG and</li> </ul>

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p>indigenous groups , academia and industry , which could break down barriers and misunderstandings that have opposed the ratification of Nagoya, and serve as a basis for future research collaboration on traditional medical Maya knowledge, sustainable use of biodiversity, intellectual property recognition and other forms of benefit sharing.</p>	<p>agreements on project objectives based on at least 2 TD meetings per year starting from year 1, where European collaborators will be expected to take part in person once a year; any additional meeting will be joined via proxy, using conference calls</p> <p>1.3 Production of a policy draft for ABS, reviewed by an independent ABS expert by month 18.</p> <p>1.4 Ethical approval is completed in academia, government and Indigenous customary practice and is approved by month 8.</p> <p>1.5 Stakeholder's agreement on the guidelines for accessing traditional ecological knowledge for sustainability assessments (NDFs), monitoring and management of biodiversity by month 24</p>	<p>1.3 Letter of ethical approval from the IRB of Guatemala, signed agreement with Releb'aal Saq'e stating approval of Maya protocol compliance (equivalent to an IRB).</p> <p>1.4 Policy document draft signed as received by government authorities.</p> <p>1.5 Completed manuscripts of tools/manuals in electronic format.</p> <p>1.6 Project and guidelines presented at side event of CITES policy conference</p>	<p>UCL's IRB procedures and/or the IRB representing government in Guatemala. It will also follow customary law as defined by Maya participants in the project, in order to ensure that design and implementation of project activities has the buy-in and ethical acceptance of all involved). We will be in a pre-campaign year for presidential elections, some IRB procedures within government might take longer than usual, or negotiations with Mayan authorities may take longer than planned.</p> <ul style="list-style-type: none"> <li>- Upcoming electoral process in Guatemala half-way into the project does not hinder participation of government stakeholders into the project, nor does it polarize indigenous representatives in a way that prevents them from reaching consensus to participate in the entire project life.</li> <li>-The constitutional court of Guatemala resumes the judicial process to restore the Nagoya protocol validity, or at least allows the national authority to implement joint research under approved CBD statutes.</li> <li>- CITES scientific authority of Guatemala, and CITES Secretariat in Geneva maintain priority on attending transdisciplinary roundtable.</li> <li>- All participants understand and value sustainable use of biodiversity as resulting from fair and equitable access and benefit sharing and integration of traditional knowledge into biodiversity assessment, monitoring and management.</li> </ul>

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p><b>Output 2</b></p> <p>Information Collection: ethnomedical body of information on selected Maya phytomedicine is produced.</p>	<p>2.1 General list of most used plants and ethnomedical bibliographic research (including safety assessment) is completed by year 2.</p> <p>2.2 A minimum of 25 patient cases are researched through ethnography and traditional Maya medical treatment comprehensively documented by month 24.</p> <p>2.3 Plants collection, identification and cataloguing is completed by year 2 (the number of species collected cannot be specified prior to case studies completion).</p>	<p>2.1 Catalogues of plants collected available at UVG herbarium (complete of scientific name, common names, Maya names)</p> <p>2.2 Database of reports, original audios and transcriptions from each completed case study</p> <p>2.3 Document on bibliographic findings on collected species (including potential health benefits and risks)</p>	<ul style="list-style-type: none"> <li>- Ethical approval is granted (is part of Output 1 but applies here too).</li> <li>- CONAP grants all legal permits to academic partners and indigenous groups for plant collection.</li> <li>- Maya healers continue to lead collaborative research for secure documentation of plant medicines and lead expeditions into habitats for their collection.</li> <li>- Climatic conditions allow for the timely collection of full specimens (during flowering times) to facilitate process of species' identification.</li> </ul>
<p><b>Output 3</b></p> <p>Access and Benefit Sharing Proposal: proposal for access and benefit sharing and protection of intellectual property, based on mutually agreed terms, coordinated by the industrial partner, and reviewed by an independent ABS expert (to be coordinated by M. Hitziger).</p>	<p>3.1 Stakeholders' agreement on the proposal for benefit sharing (including non-monetary benefits relevant to local priorities), in the event that a commercial product is developed, by the end of month 20 and indigenous community approval by month 24.</p>	<p>3.1a List of species with commercial potential documented.</p> <p>3.1b Minutes from stakeholders' meetings.</p> <p>3.1c Approved agreements.</p> <p>3.1d Community and stakeholders group attendance sheet.</p>	<ul style="list-style-type: none"> <li>- Presence of species with commercial potential.</li> <li>- The political climate does not hinder participation of industry in the consortium.</li> <li>- Communities and stakeholders agree on IP and ABS principle proposals.</li> <li>- The project consortium will identify an independent expert from academia or international policy arenas with demonstrated expertise in ABS policy and implementation processes, who will review the developed documents and guidelines for their adherence to pertinent international standards.</li> <li>- Key indigenous leaders adhere to commitments made within the TD stakeholders'</li> </ul>

Project summary	Measurable Indicators	Means of verification	Important Assumptions
			<p>platform and abstain from smearing campaigns which previously impeded advancing dialogues, such as the misinformation campaign of 2016 placing Nagoya regulations in the same law-package informally known as the “Monsanto” law (allowing benefits to multinational companies in detriment of small farmers), which generated great opposition.</p>
<p><b>Output 4</b> Local Framework: improved (from baseline) and sustainable access and availability of key medicinal plants for indigenous healers/communities based on locally defined strategies and terms, ensuring equal participation of women</p>	<p>4.1 The number of species to which individual healers have direct access by the end of year 3 is increased by at least 20% in relation to the baseline at the onset of the project.</p> <p>4.2 Participation in medicinal garden cultivation and management is over 50% by knowledgeable women by the end of year 3.</p> <p>4.3 A municipal proposal for potential implementation of one protection area still holding biodiversity of medicinal plants is drafted by month 22 and evaluated and potentially agreed by the government by year 3.</p>	<p>4.1 Healers and community household surveys on access to medicinal plants to be compared to the established baseline at the beginning of the project</p> <p>4.2 Pre and post training knowledge assessment</p> <p>4.3 List of appointed garden managers</p> <p>4.4 Proposal draft in Spanish (with English summary) and eventual signed agreement on the protection area by the government.</p>	<ul style="list-style-type: none"> <li>- A satisfactory process of Outputs 1 and 2 is able to be transformed into direct actions for protection and increased availability of medicinal plant species selected as by indigenous healers and other stakeholders.</li> <li>- Population adjacent to the medicinal garden site do not interfere with the establishment/extension of the garden.</li> <li>- Data showing the value of natural capital for improving health in Maya communities is legitimate and recognized by project partners, allowing implementation.</li> <li>- Enough funding is available to implement the main activities chosen by this consortium (TD platform).</li> </ul>
<p><b>Output 5:</b> Dissemination: dissemination of the project’s results and strengthening of the national dialogues on biodiversity and traditional knowledge. The</p>	<p>5.1 At least five academic papers published (Open Access) addressing key findings of project components by project end.</p> <p>5.2 Online and printed publication of tools developed via the TD process in</p>	<p>5.1 Academic papers will be published on Open Access journals</p> <p>5.2 All tools developed will be available also in an online format and accessible to all through publication on Open Access platforms.</p>	<ul style="list-style-type: none"> <li>- Discussions and agreements on intellectual property rights of indigenous groups follow</li> <li>due-process as described in the CBD/NAGOYA and local TD table agreements during the course of this</li> </ul>



Project summary	Measurable Indicators	Means of verification	Important Assumptions
dissemination will include CBD processes.	<p>the form of a manual, to foster replication by project end.</p> <p>5.3 Lay publications for stakeholders use according to strategy defined jointly by TD table by project end.</p> <p>5.4 At least one video documenting the process of the stakeholders' dialogue to develop the project, and one on research outcomes (traditional medical knowledge and biodiversity protection).</p> <p>5.5 At least two presentations at international conferences relevant to the ABS processes (CITES, CBD, and/or academic)</p>	<p>5.3 The lay publications will be available online on Open Access platforms.</p> <p>5.4 Videos will be uploaded on Open Access platforms, in order to be accessible to all.</p> <p>5.5 Conference abstracts and proceedings will be available online.</p>	project and allow for the timely publication and dissemination of results.
<p><b>Activities</b> (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)</p> <p>1.1 A 'round table' comprising all relevant stakeholders to sign a cooperation agreement for the project's duration, following a TD format.</p> <p>1.2 Writing and submission of IRB protocols for UK, Guatemala and Maya Council.</p> <p>1.3 Appointment/election of a TD steering board constituted by at least 30% women and 25% indigenous leaders, signing of MOU with operational plan for year 1.</p> <p>1.4 Steering board meetings are conducted to discuss the development of the framework with all stakeholders (including preparation of materials for discussion)</p> <p>1.5 Conduction of eight TD workshops for discussion and negotiation of components for implementing Addis Ababa's principles and Nagoya.</p> <p>1.6 Drafting of procedural protocols for inclusive application of Addis Ababa principles in sustainability assessments (NDFs), monitoring and management of medicinal plant resources</p> <p>1.7 Production and dissemination of procedural tools (manuals and documents) for implementing Guatemala's Nagoya protocol including the proposed ABS pathways for Guatemala and Q'eqchi' participating communities.</p> <p>2.1 Organisation of community meetings via AGERS Council to present project details to elders, individual enrolment of healers, creation of participants' list within Maya ceremonial protocol.</p> <p>2.2 Initial ethnographic research of most-common referred plant lists per ailment (syndrome-based and cultural ailments).</p> <p>2.3 Participatory observation, interviews and focus groups to build up medical case studies.</p> <p>2.4 Analysis of the ethnomedical and ethnobotanical data to assess how gender, age and socio-cultural background affect access and use of medicinal plants.</p> <p>2.5 At least 90% of plants used by the healers in the medical case studies are collected, deposited and identified at UVG herbarium.</p> <p>2.6 Integration of academic knowledge on the species collected through literature research on traditional uses, toxicological and pharmacological assessment (safety and efficacy) based on bibliographic evidence.</p> <p>2.7 Production of maps highlighting areas of medicinal plant diversity, risk assessment and proposed areas for protection</p> <p>3.1 Sharing information on medicinal species (from Output 2) with industrial partners and identification of species with commercial potential, protectable by IP rights.</p> <p>3.2 Selection of 1 or 2 plants from the list produced by the industrial partners in 3.1 that will be used as a proof of concept.</p> <p>3.3 Stakeholders meetings/workshops lead by the industrial partners to build a model ABS agreement.</p>			

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p>3.4 Workshops to present the model agreement to the broader indigenous groups to facilitate consensus and agreement on potential pathways to benefits.</p> <p>3.5 Stakeholders' meetings to discuss examples of non-monetary benefits of interest to the communities involved or propose new ones.</p> <p>4.1 Establish the baseline of access and availability of medicinal plants to the healers</p> <p>4.2 Consensus meeting with AGERS Council elders to choose local options for assisted (artificial) reproduction of key species</p> <p>4.3 Creation of medicinal plant gardens and seed repository (following technical assessment of the areas, suggested by AGERS, and adaptation needs for reproduction of selected species).</p> <p>4.4 Planting of selected species in the gardens and disseminated via seed and seedling exchange (based on the assessment in 2)</p> <p>4.5 Organization, training and supervision of women that will be tending/managing the garden.</p> <p>4.6 Meetings for the identification of biodiversity-rich areas (including key medicinal plants) that could be targeted for protection (GIS mapping).</p> <p>4.7 Discussion with government officials on the feasibility of the creation of protected areas with presentation of mapped areas.</p> <p>5.1 Writing of lay publications regarding process (replication) and outcomes (communities' information process), dissemination in digital and printed forms.</p> <p>5.2 Writing of academic papers.</p> <p>5.3 Production of videos and dissemination in online-formats.</p> <p>5.4 Conference presentations.</p>			

## Annex 3: Standard Measures

**Table 1 Project Standard Output Measures**

Cod e No.	Description	Gender of people (if relevant)	Nationality of people (if relevant)	Year 1 Total Anticipated / achieved)	Year 2 Total	Year 3 Total	Total to date	Total planned during the project
3	One Licenciatura (Bachelor) thesis from partner University in Guatemala (Anthropology)	1F	Guatemalan	0/0	1		0	1
4A	Undergraduate students from anthropology and biology at UVG	2F, 1M  Mixed	Guatemalan	3/3	5	1	3	9
4B	Four weeks of in-depth training in the field.  b.5 days training in ethnobotanical collection of samples	F  F  Mixed group	Guatemalan	3/4	5	2	4	11
7	Videos (2), Manuals (2), Training material (3): one booklet per TD workshop			1/1	3	3	1	6
9	Proposal for conservation area in Petén			0/0		1	0	1
10	Guide for collection of medicinal plants in Peten region			0/0		1	0	1
11A	Papers to be published in peer reviewed journals			0/1	2?	2?	1	4
11B	Papers to be submitted in peer reviewed journals			0/1	2	2	1	4?
12A	Database of medicinal plant species			0/0	1	0	In progress	1

	for selected areas, developed by Guatemalan partner.							
13 A	Collection of medicinal plants in herbarium UVAL-UVG			0/0	1	0	In process	1
14A	One seminar organized per year for each TD workshop, One overall final seminar to present all findings			0/0	1	2	0	3
14B	Conferences & seminars to attend			0/2 (FS)	2?	2?	2	6
20	Computer, camera, GPS, small collection equipment			2/3	0	0	3	1900
22	One permanent medicinal plant plot			0/0	0	1	In process	1
23	a) Interact health project Zurich b) Private donation for medicinal garden							

**Table 2 Publications**

<b>Title</b>	<b>Type</b> (e.g. journals, manual, CDs)	<b>Detail</b> (authors, year)	<b>Gender of Lead Author</b>	<b>Nationality of Lead Author</b>	<b>Publishers</b> (name, city)	<b>Available from</b> (e.g. weblink or publisher if not available online)
Access and Benefit Sharing under the Nagoya Protocol – Quo vadis? Six Latin American case studies assessing	Journal	Michael Heinrich* , Francesca Scotti, Adolfo Andrade-Cetto, Mónica Berger-Gonzalez, Javier Echeverria,	M (5 women and 8 men as authors)	German	Frontiersin.org	<a href="https://www.frontiersin.org/journals/pharmacology/sections/ethnopharmacology#">https://www.frontiersin.org/journals/pharmacology/sections/ethnopharmacology#</a>

opportunities and risk		Fabio Frisio, Felipe Garcia-Cardona, Alan Hesketh, Martin Hitziger, Caroline Maake, Matteo Politi, Rita Spadafora* and Carmenza Spadafora				

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

### **List of evidence for Y1 Report (provided separately)**

COVID-19 impact on Green Health document

1.1a TD Aug 2019 Attendance Sheet

1.1b Minutes of TD meeting Aug 2019

1.1c Cooperation agreement

1.1d Agenda of TD meeting Aug 2019

1.1e UVG letter to CONAP asking for participation

1.1f Designation letter CONAP

1.2a IRB protocol Maya ACGERS Council Maya

1.2b FOLDER - Submitted original ethical protocol UVG

1.2c Latest ethical Protocol feedback (Apr 2020)

1.3a Elected TD board list

1.3b Operational plan for Y1

1.4a TD meeting Manual

1.5a Minutes and participants' list for TD meeting Nov 2019

1.6a Summary of extra minutes available on request

2.1a Green Health Report Jun

2.1b InterAct and Green Health Report Dec 2019

2.1c List of enrolled healers

2.1d FOLDER Midwives training: participants' list, minutes

2.2a Epicultural booklets database (Jul-Dec 2019)

2.2b List of plants mentioned in the booklets (healer + Q'eqchi' plant name)

2.3a FOLDER - Initial case studies chosen: case 1, 2, 3, 4, 5.

2.5a Herbarium database (Mar 2020)

2.6a Literature search outcome for identified species

3.1a Anonymised species overview (Mar 2020)

3.5a Garden progress report

5.2a Agenda of UCL meeting Access Benefit Sharing Oct 2019

5.2b Minutes of UCL meeting Access Benefit Sharing Oct 2019

5.2c Abstract of ABS paper

5.4a Abstract for ISE2020

5.4b Abstract for ASA2020

## Checklist for submission

	Check
<b>Is the report less than 10MB?</b> If so, please email to <a href="mailto:Darwin-Projects@ltsi.co.uk">Darwin-Projects@ltsi.co.uk</a> putting the project number in the Subject line.	v
<b>Is your report more than 10MB?</b> If so, please discuss with <a href="mailto:Darwin-Projects@ltsi.co.uk">Darwin-Projects@ltsi.co.uk</a> about the best way to deliver the report, putting the project number in the Subject line.	v
<b>Have you included means of verification?</b> You need not submit every project document, but the main outputs and a selection of the others would strengthen the report.	v
<b>Do you have hard copies of material you want to submit with the report?</b> 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.	NA
Have you involved your partners in preparation of the report and named the main contributors	v
Have you completed the Project Expenditure table fully?	v
Do not include claim forms or other communications with this report.	