Darwin Initiative Main Project Annual Report

Important note: *To be completed with reference to the Reporting Guidance Notes for Project Leaders: it is expected that this report will be about 10 pages in length, excluding annexes*

Submission Deadline: 30 April

Darwin Project Information

Project Reference	20-013
Project Title	Medicinal root trade, plant conservation and local livelihoods in southern Morocco
Host Country/ies	Morocco
Contract Holder Institution	Global Diversity Foundation
Partner institutions	High Atlas Foundation; Institut Scientifique, Université Mohammed V-Agdal, Rabat; Regional Herbarium and Ecology & Environment Laboratory, Cadi Ayyad University; Department of Environment, Ministry of Energy, Mines, Water and Environment
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Reporting period (e.g., Apr 2015 – Mar 2016) and number (e.g., Annual Report 1, 2, 3)	Apr 2013 – Mar 2014 Annual Report 1
Project Leader name	Gary J Martin
Project website/blog/Twitter	A general description of the project is available on GDF's UK website,http://www.global-diversity.org/north-africa/projects/medicinal-root-trade and periodic updates are posted on the GDF North Africa news page http://www.global-diversity.org/north-africa-news
Report author(s) and date	Gary J Martin and Emily Caruso with input from Hassan Rankou, Larbi Didouquen, Yossef Ben-Meir and colleagues from other partner institutions. 15 June 2015

1. Project Rationale

As set out in our project proposal, we are addressing threats to the sustainable harvest of vulnerable plant resources in unique and biodiverse Moroccan Mediterranean ecosystems. This is essential in maintaining the ecological integrity of Important Plants Areas (IPAs), ensuring the subsistence of millions of herbal remedy users, and sustaining commercial trade that contributes to the livelihoods of thousands of collectors, vendors and traditional practitioners. Our previous ethnobotanical research in southern Morocco, which identified more than 300 species of commercialized medicinal plants, led us to focus on medicinal roots, particularly vulnerable to unsustainable harvesting yet in high demand in domestic and international trade. We enhanced our understanding through interactions with colleagues from academic, government and non-governmental institutions, and through participatory research with rural collectors and urban herbalists.

This project also addresses poverty alleviation in Morocco. The 12th largest exporter of medicinal and aromatic plants (MAPs) in the world with a centuries old tradition of trade in herbal products, Morocco faces the challenge of conserving biodiversity while encouraging rural peoples to benefit economically from wild-crafting and value-adding activities. According to the UNDP, the annual national income is nearly $25 million from cultivated MAPs and $37 million from wild-crafted species. Morocco is keen to expand its share of a $15 billion global market while mainstreaming biodiversity conservation throughout the value chain. Our approach recognizes that while increased production and marketing of MAPs can improve the livelihoods of rural communities, greater economic security will be afforded by additional productive activities such as the cultivation of fruit and nut trees.

Our project focuses on two rural communes in the Atlas Mountain corridor of Morocco – Imegdale and Ait M'hamed. These communities are situated in highly biodiverse areas – with significant levels of plant endemism – and are highly dependent on agriculture, with approximately 70% of the population involved in animal husbandry and crop production.

Ait M'hamed in Azilal Province has a population, as reported in the 2004 ten-yearly census (we are still awaiting new data from the 2014 census), of nearly 21,742 people in 3190 households in 47 douars, with an average of 6.8 people per household. Ait M'hamed comprises a sub-basin of the Oum Er Rbia river basin and is situated near the proposed Western High Atlas National Park. The population is highly rural, with only 10% of people living in urbanized areas. Indicators of development are low: around 10% of the households have domestic drinking water, electricity and plumbing. Agriculture and animal husbandry, dependent on grazing in forests and pastures, are the primary economic activities. Most agricultural plots are smaller than 5 ha, and irrigation reaches only 6% of cultivated lands. There are about 94,000 apple, almond and walnut trees, far from the agroforestry potential of the commune. Seasonal and permanent migration are an important factor, with more than 350 families having permanently left the area, and more than 2,200 individuals who seek temporary work in Morocco's urban areas. Collection of *Anacyclus pyrethrum* and other medicinal and aromatic plants is historically important and currently practiced by hundreds of community members. The commune authorities are keen to expand the cultivation of these plant resources, and are collaborating in the establishment of a nursery, funded in part through this project, that will produce fruit and nut trees as well as medicinal plants for distribution to community members.

Imegdale, in Al Haouz Province, has a population of over 5,500 people in more than 1,000 households, with an average of 5.3 people per household, distributed in 17 douars (villages). As with Ait M'hamed, the population is highly rural, and indicators of development are low: only 7% of the households have domestic drinking water, 14% have electricity and 29% have a septic tank. Imegdale neighbors Toubkal National Park and the Tiradine and Takherhort Hunting Reserves and is a sub-basin of the Nfis river basin. The wild harvest of thyme, lavender, artemisia and other medicinal and aromatic plants is an important economic activity of nearly 900 community collectors. Through this project, the members of a local cooperative and the commune authorities have established a community plant nursery and are exploring other ways of ensuring the sustainability of plant harvesting and improving their livelihoods.

In annex 4 of the first annual report, which is available on request, we presented various maps of the location and main geographical features of these rural communes.

2. Project Partnerships

Almost all project partners participated in the second workshop of the project, held March 31 – April 1, 2014 in Marrakech, on *Implementing the Global Strategy for Plant Conservation (GSPC) in Morocco*. Mr Larbi Didouquen and Dr Abderrahim Ouarghidi represented the High Atlas Foundation, while the Scientific Institute of Université Mohammed V-Agdal, Rabat sent Dr Mohammed Sghir Taleb and Prof Mohammed Fennane. Prof Ahmed Ouhammou and Dr Nadia Bouab of the Ecology & Environment Laboratory, Cadi Ayyad University also attended. Our *de facto* partners were also represented, as Dr Ali Chafai Elalaoui of the UNDP/GEF Medicinal and Aromatic Plants Programme attended the first part of the workshop and we were pleased to have Ms Jihane Bejbouji and Mr Ahmed Zaakour of Toubkal National Park, which is part of

the Division of Parks and Natural Reserves of the High Commission of Water and Forests. The only exception was the absence of a representative of the Department of Environment, Ministry of Energy, Mines, Water and Environment, as Mr Mostafa Madbouhi was unable to join us. We were particularly happy to have the participation of Dr Mohammed Rejdali, a member of the Moroccan Parliament, and head of the governmental oversight committee for these institutions. As noted in our previous report, Dr Rejdali, when he was a professor of botany at the Agricultural and Veterinary Institute, was a partner on previous Darwin Initiative grants in Morocco, and is highly supportive of the work being carried out in the current project. The workshop was a second opportunity to reconfirm the interest from representatives in these diverse institutions in the Darwin Initiative project while exploring the implementation of the GSPC, which responds to a specific goal of the host country.

The Global Diversity Foundation has maintained a relationship with all of the above named individuals, and other representatives of these institutions, and they were involved in project planning and decision-making according to the roles noted in our project proposal. GDF continued to have a particularly close collaboration with the High Atlas Foundation during the second year of this project, during which the development of plant nurseries, an ethnobotanical inventory and other community activities were a central focus. We also had frequent interactions with Ahmed Ouhammou of the Cadi Ayyad University, who supported field research and training opportunities, especially the mounting of plant specimens, identification of the collected species and establishment of ecological survey plots. Keep in mind that both HAF and Cadi Ayyad University are located in Marrakech, a city near the two field sites and the place where GDF has its base in Morocco. Representatives of partner institutions in Rabat, which is about four hours from Marrakech, were consulted on key elements of the project development, but have had – as noted previously – a less active role in field activities. Project leader Gary Martin, Mohamed El Haouzi, projects director of GDF in Morocco and key consultant Hassan Rankou travelled to Rabat from 4-6 February and held a meeting with Dr Mohammed Sghir Taleb and others from the Scientific Institute of Université Mohammed V-Agdal, Rabat on 5 February to discuss collaboration on the project.

We have experienced a continuing challenge of working with government institutions, such as the High Commission of Water and Forests and Department of Environment, Ministry of Energy, Mines, Water and Environment. There was a change of personnel in the former institution, and Mr Mostafa Madbouhi of the latter was unable to attend our meeting at the Scientific Institute at the last minute. A significant amount of administrative effort and time is required to maintain communication and arrange participation in specific events and meetings, but we remain confident of government interest in our efforts, especially as they continue to yield specific outputs such as conservation assessments and online databases.

The relationship among institutions involved in the project was further cemented by the creation of the Moroccan Biodiversity and Livelihoods Association (MBLA), which grew out of the establishment of the Moroccan Plants and Livelihoods Special Group (MPLSG) in the launch workshop. Although a significant amount of work remains to consolidate the MBLA, it has been officially registered with the Moroccan government, leading to the holding of the first board meeting, opening of a bank account and other formalities. In its first substantial activity, MBLA led the organization of a workshop on *Best practices in biodiversity conservation and local livelihoods* which was held in Tahanaoute, Morocco from Thursday 28th to Saturday 30th May, 2015. MBLA and MPLSG show promise of expanding communication among partner institutions and other stakeholders in Morocco.

3. Project Progress

3.1 Progress in carrying out project activities

Output 1. Understanding of change in abundance, distribution and harvest of 10 species of medicinal roots and in overall plant diversity of communal lands, forest domains and protected areas in two rural townships

Conservation assessments of medicinal root species (along with many other species) have been completed and are ready for publication. The participatory floristic studies and ecological

surveys in the project communes of Imegdale and Ait M'hamed are ongoing in collaboration with the community researchers (Fadma Ait Illigh, Hassan Ait Ba and Hamid Ait Baskad from Imegdale, and Samira Agnaou, Adil Merzoug and Mustapha Hammou from Ait M'hamed) who will be in a good position to continue with the monitoring and implement conservation measures. Hassan Rankou has played a key role in developing these outputs. The following highlights include extracts from Annex 4, which is a report from Hassan that provides greater detail and illustrations of these activities.

At both sites, Ait M'hamed and Imegdale, we proceeded with floristic and ecological studies with a special focus on medicinal and endemic species. We intensified efforts to train local researchers and students (including 2 PhDs and 1 MSc from Cadi Ayyad University and Irene Teixidor from University of Reading) in field collection of specimens, mounting herbarium specimens, identifying plants, and herbarium database development. A one-day fieldtrip to the MARK herbarium at Cadi Ayyad University allowed the participants to experience herbarium management first hand, and were provided with information on the importance and objectives of herbarium management (see Annex 4). In the first phase of field collection, community researchers collected nearly 1000 herbarium specimens (each with four duplicates), and we identified the species in a one week identification workshop in Marrakech, began the creation of two local herbaria in the two sites of the project, built the capacity and collections of the MARK regional herbarium and sent a set of collections to the herbarium (ISRABAT) of the Scientific Institute for curation and digitalization. An additional workshop on best practice in MAP collection was provided by Hassan Rankou at the request of MAP collectors in Imegdale.

Hassan Rankou completed the Red listing and conservation assessments of the medicinal plants that are the specific focus of the Darwin project as well as the endemic monocotyledons of the region according to IUCN criteria and categories. One conservation assessment – that of *Anacyclus pyrethrum* – remains to be finalised as we were lacking data on population changes over time. This data is currently being collected in the field by Abderrahim Ouarghidi, with a view to completing the assessment at the end of 2015. Our project partners and collaborators Prof. Mohammed Sghir Taleb and Prof. Mohamed Fennane (Institut Scientifique Rabat), Dr Stephen Jury (Reading University) and Prof Ahmed Ouhammou (Cadi Ayyad University) reviewed the assessments, as did anonymous IUCN referees. The assessments have now been completed, cross-checked and submitted to the IUCN Red List Unit, and are awaiting publication sometime this year. The conservation assessments of the Moroccan endemic monocotyledons flora were published in April as an article in the *Botanical Journal of the Linnean Society*. Hassan provided a 1 week conservation assessment field-based training workshop for community researchers and students from Cadi Ayyad University. Following a theoretical background, the participants developed their practical skills in conservation assessment census, how to collect data for conservation assessments according to IUCN criteria and categories, and how to calculate area of occupancy and extent of occurrence.

Analysis of the results and the associated data from the IUCN conservation assessments, the species distribution models and the threats evaluation revealed a high extinction risk. Most of the species are threatened by habitat loss and degradation, direct and indirect human disturbance, changes in vegetation dynamics, climate change and intrinsic factors. We concluded that urgent conservation actions are needed in specific areas to preserve the future of the local flora and we should take into consideration an integrated approach to the combination of many threat factors from natural to human causes that act synergistically. This study was submitted as paper to *Conservation Biology*.

In Imegdale, ecological monitoring was begun by setting up two Line Intercept Transects (LIT) in an enclosure site adjacent to the community plant nursery and a third one accessible just outside the enclosure. The objective of this approach is to contribute to the documentation of biodiversity and the frequency of the most common species in the area. An examination of changes in species density and diversity over time in the enclosure versus outside of it will also enable comparison between areas under protection and those exposed to grazing and plant harvesting, providing local communities with the tools to make informed decisions regarding the establishment of enclosures in their territories to enhance medicinal root populations. This process also gave us the opportunity to carry out further training sessions. Hassan Rankou

provided community researchers and three Cadi Ayyad University students with a 1-week field training course on ecological field techniques.

In Ait M'hamed, Abderrahim Ouarghidi is carrying out ecological monitoring with a focus on the most over-harvested medicinal plant root *Anacyclus pyrethrum.* Here, he is monitoring changes in *A. pyrethrum* density over time in 5 different sites using 20m wide transects. The first data were collected in 2010, before the Darwin project began, and comparison with 2015 data will give us an idea of changes in density over 5 years. Data are also compared between areas under community protection, non-protected areas and forest landscapes. Initial results show that *A. pyrethrum* density is highest by collector's houses and other areas under specific community protection, indicating that local conservation measures such as seed and root propagation and protection from predation and poaching are successful approaches that could be expanded to other communities. The results emerging from this project, expected in yr 3, will provide collectors with more data and methods to expand their incipient conservation approaches, whilst also allowing us to share these measures with other collectors in the High Atlas who wish to implement locally adaptable *A. pyrethrum* conservation techniques.

Output 2. Participatory planning conducted in two townships, generating socio-economic and environmental data to assist community decision-making throughout the project cycle and delivering a comprehensive assessment of livelihood impacts by project end

In Imegdale, a basic socioeconomic assessment has been conducted in all villages, through the use of questionnaires administered in collaboration with the representatives of the local association. The questionnaires generated basic socio-economic data on the extent of local infrastructure and economic activities. It also explored the local agricultural sector, providing data on land ownership, types of agriculture practiced, area of land under cultivation, and forms of irrigation. Animal husbandry data was also captured, in particular numbers of heads of cattle, sheep, goats and chickens, as well as beehives, for the whole township. In Ait M'hamed, the same basic socioeconomic survey was delivered to the heads of the associations of the townships in May 2015. We expect the results to be collected by mid-June and analysed by end of June.

In both Ait M'hamed and Imegdale, social research has been carried out to examine in greater depth local water management scenarios, providing detailed pictures of local water use, drinking water availability, infrastructure for water management, irrigation systems and wastewater management. This in-depth water management work is carried out with co-funding from the Critical Ecosystem Partnership Fund for a project entitled *Integrated River Basic Management in Ait M'hamed and Imegdale Rural Communes in Morocco*. Yet for the purposes of the Darwin Initiative-funded project, the research provides us with important information regarding current environmental and socioeconomic situations in these communes, given that water scarcity and unpredictability can limit local agroforestry production (including production in plant nurseries) and animal husbandry, and poor water management limits flows to ecologically important and biodiversity-rich areas located outside of population centers of the townships.

As mentioned in the yr 1 report, with this project we also seek to go beyond economic measurements of project impact towards a more holistic evaluation of project impact based on an ongoing ethnographic study of socio-ecological wellbeing. For this purpose, Abderrahim Ouarghidi is developing a participatory approach to data-gathering. Following an in-depth literature review, he is in the process of training two female community researchers in Ait M'hamed and 1 male and 1 female community researcher in Imegdale in socioeconomic data gathering, including quantitative and qualitative approaches. In collaboration with these community researchers he has developed a detailed questionnaire that has been translated into both Arabic and Tamzight and which will begin being applied, alongside in-depth interviews, in both communes in early June 2015. Villages in each commune are being selected using a stratified sampling approach based on distance from urban centre, road access and access to resources. Within each village HH selection will be random. The survey tool will be piloted prior to data collection. Data entry for the questionnaires is planned for the end of September: further ethnographic data collection will take place throughout subsequent

months to ensure we capture a detailed picture of the project's impact.

Output 3. Two community plant nurseries established, leading to production of 40,000 individual seedlings and saplings, and their distribution to 1000 households engaged in terrace cultivation and enrichment planting.

With our partner the High Atlas Foundation we have continued to develop fruit and nut tree and medicinal plant nurseries in the two rural communes where we work to enable terrace cultivation and enrichment planting of selected medicinal roots and tree crops. In Imegdale, the local cooperative Imdoukal Znaga is maintaining a single, substantial nursery that spreads across 24,000 m^2. The almond and walnut saplings (8000 and 10,000 respectively) are ready for grafting in the summer of 2015, using local varieties that are known and appreciated by community members. Additional 2089 seedlings of 7 other species (carob, vine, lemon, olive, quince, pomegranate, fig) have been included in the nursery. A total of 4722 plants of 6 different species of medicinal and aromatic plant (MAP) are being cultivated inside the greenhouse, which was now been covered in plastic during the winter and is now reopened to direct sunlight. Almost 1000 seedlings of a variety of trees and MAPs have now also been planted directly into the ground. Community researchers Hassan Ait Ba and Hamid Ait Baskad continue to be the main people responsible for the nursery in Imegdale, and other community members assist them for specific tasks. A proposal to expand the provisioning of water from a nearby ravine to the 165 m^3 water basin is completed, and will now be studied by Resing to assess its potential environmental and social impact. Once the necessary work is completed in the third year of the project, there will be a decreased dependence on the other source of water, which is pumped – at considerable cost in electricity and fuel – from the water tower that is fed by a riverside well.

50,000 walnuts trees have been planted in the Tighza nursery in Ait M'hamed valley, which is on land donated by the community. The nursery is taken care of by a local farmer and the trees will be ready for distribution in two years (2017). The new medicinal plant nursery in the village of Ait M'hamed has been located just outside of the main village, and will be established in July, when Iguendez (*Anacyclus pyrethrum*) is harvested, to allow seed dispersal prior to harvest. In early May 2015, 3 full days of training in seed harvesting – in particular in recognizing mature seeds for harvest – and enrichment planting techniques were provided to 5-6 *Anacyclus* harvesters in Ait M'hamed. The team also went to the field to collect 16 plant roots for vegetative reproduction: these have been cut and 200 seedlings are now growing in small sacks in the HAF nursery in Ourika, which is guarded. The plants will be ready for seed harvesting in August and for transplanting into the new Ait M'hamed nursery in September/October 2015. In a first stage, we aim for the production of 10,000 *Anacyclus* plants, to be distributed equitably between harvesters who have participated in the project Ait M'hamed.

In response to a question in the review of our first annual report, the process for allocating tree seedlings within partner communities is as follows. Walnut seedlings are only allocated to the villages located at higher altitudes as walnut trees do not grow well in the valleys. Here, they are allocated equitably between villages. In accordance with ethical best practice, we let the traditional village council (*Jmaa*) make the decisions about allocations within the villages. Notably, in line with both customary procedures and Islamic law, the *Jmaa* makes these decisions to ensure equitable distribution of benefits. Mostly, families who have access to land and irrigation resources are those that wish to plant and manage the seedlings. However, those families who do not have such access will be given the opportunity to (a) plant their seedlings on communal lands and (b) sell their seedlings to families who have access to land and irrigation resources. In addition, villages may choose to trade seedlings between each other as well, based on availability of land and resources.

In addition to continuing horticultural activities in the plant nurseries – cultivation of almond, carob, fig, olive, pomegranate and walnut trees, planting seeds and making cuttings – there was an intensive programme of capacity building in this period. The diverse training events, including community exchanges, workshops and field exercises, covered topics such as valuation of local products, marketing chains, organization of associations and cooperatives to

diversify production and gain market access, maintenance of biodiversity and restoration of degraded areas, acclimatizing wild species to cultivation on private plots of land, and familiarization with national agencies involved in landscape management and conservation (specifically the Direction Provinciale des Eaux et Forêts, Direction Provinciale de l`Agriculture, and the Office de Développement de la Coopération). Eight of the training events were specifically for cultivators of walnut trees, including two in the High Atlas Foundation headquarters, two in the main office of 'Association des Amis du Parc National de Toubkal pour la Protection de l`Environnement et la Conservation du Noyer' and four in the walnut processing facility of the IDRAREN des Producteurs des Noix Cooperative in Asni. The first four of these sessions were led by Larbi Didouquen of HAF and specialised trainers from the Institut National de la Recherche Agronomique of Méknes. These training events are well received by community members, as they provide specific relevant information and techniques they can share more widely in the rural commune: selection of varieties adapted to local conditions; water, light, space and fertiliser requirements; diseases and pests of walnuts and how to combat them; harvesting and valuation of the nuts.

The walnut processing facility in Asni was established in October 2014 by HAF, and will begin processing walnuts to produce organic oil and walnut halves again at harvest time in August-September of 2015. Producers from Imedgale and At M'hamed will sell their whole nuts to the Asni cooperative (which they are part of) for the national market price of 0.25Dh – 0.40Dh per whole nut (0.017 GBP - 0.029 GBP per whole nut). The Asni cooperative will then process the nuts and sell the processed produce to the HAF limited company HA^3 (High Atlas Agriculture Artisanat), which will sell the produce in the United States. All profit from sale will return to the Asni cooperative for the implementation of development projects that benefit the communities. Currently, walnuts are the main focus of this processing and marketing chain. Almonds, another future product of the Darwin Initiative-funded nurseries, are sold directly to middlemen for sale at regional markets. However, HAF's intention is to eventually establish the same HA^3 processing and marketing chain for almonds, and eventually for other products. In addition to these processes, HAF is currently implementing a series of trainings for the Ait M'hamed women's cooperative to provide them with the tools for entering into partnerships, particularly for the sale of organic medicinal and aromatic plants. This information responds to the year 1 report reviewer's request for details on our project's approach to marketing produce.

In addition to these activities, in year 2 we intensified our ethnobotanical inventory, with a focus on local useful plants that are candidates for cultivation in the expanding plant nurseries. Irene Teixidor, a University of Reading School of Biological Sciences doctoral student who is conducting her research in Morocco under the EU MedPlant Marie Curie Initial Training Network (http://medplant.eu/), is working with community researcher Fadma Ait Illigh to conduct interviews about local uses of the plants that have been identified in the community inventory. Their interactions with 37 women and 5 men have yielded 561 use reports thus far, including of plants that are cultivated (e.g. *Iris germanica*, grown on the margins of fields and sold for ~100 Dhs (£6.7)/kg), collected for trade (e.g. *Thymus satureioides*, which is harvested from the wild by women and children and sold for about 11 Dhs (£0.75) /kg), formerly gathered (*Capparis spinosa*, intensively collected in the past and now primarily by children and sold for 20-30 Dhs (£1.35 - £2)/kg), and others with market potential that are not current exploited (*Cistus salviifolius*, *C. laurifolius, Satureja alpina* subsp. *meridionalis*). This is a long-term approach to slowly diversifying production in the rural communes while maintaining a primary focus on plant products – such as almonds, walnuts, lavender and thyme – which have a demonstrated market value and demand.

Output 4. Policy guidelines developed based on international expertise and practical case studies to advise government agencies and other stakeholders responsible for implementation of the GSCP, NBSAP, National Strategy on MAPs and other instruments related to the environment and sustainable development.

In contribution to this output, at the beginning of this reporting period, GDF and partners implemented the stakeholder workshop *Implementing the Global Strategy for Plant Conservation in Morocco* (31 March-1 April 2014). This workshop aimed to support the implementation of the GSPC in Morocco through (i) Sharing experiences on identification and

engagement of key GSPC stakeholders in Morocco; (ii) Reviewing progress towards the GSPC targets globally and in Morocco, as a contribution to the mid-term review of the GSPC; (iii) Identifying gaps in implementation and developing strategies to address them; (iv) Identifying ways and means to further integrate plant conservation activities into Morocco's NBSAP; and (v) Introducing the GSPC toolkit and reviewing opportunities for Morocco to contribute to it. The workshop was designed for both plant conservation practitioners and those involved in biodiversity policy in Morocco. Participants included representatives from government, scientific institutes, universities, NGOs and botanic gardens in Morocco.

The workshop helped to consolidate linkages between plant conservation stakeholders in Morocco, including by providing government agency representatives with direct linkages to practitioners, entrepreneurs and researchers involved in on-the-ground plant conservation and livelihoods activities. It provided all participants with updated information available concerning progress towards the GSPC targets in Morocco, while also providing a forum for identifying and discussing major constraints and gaps in plant conservation and opportunities to address these discussed. Stakeholders left the workshop with a better understanding of the linkages between the GSPC targets and the Aichi biodiversity targets and greater awareness of the GSPC toolkit and resources available to support GSPC implementation. Please see Annex 5 for a full report of the workshop.

Notably, during the introductory discussion regarding Morocco's implementation of the Global Strtegy for Plant Conservation, workshop participants agreed that lack of capacity was a major concern, particularly with respect to young botanists, of which there are few who have few jobs available upon graduation. GDF and partners have recognised this as a fundamental issue in Morocco and have sought solutions, with support of the Darwin Initiative grant. One way in which we have contributed is through facilitating and fomenting the formation of the Moroccan Biodiversity & Livelihoods Association (MBLA) in December 2014. MBLA a local NGO formed by young Moroccan researchers and practitioners who are motivated to collaborate for plant conservation and sustainable livelihoods. One of the first activities of this NGO is the implementation of the upcoming third project workshop *Best Practices in Biodiversity Conservation and Local Livelihoods in Morocco* (27-30 May 2015), which gathered young botanists and biodiversity specialists from all over Morocco and abroad for an intensive networking and mutual learning session. This activity will be reported on fully in Year 3, but see Annex 6 for the programme of the workshop, which was prepared in this reporting period.

In collaboration with GDF, MBLA is currently developing a series of at least 10 case studies to submit to the GSPC in the coming year (Target 16). This is taking place through continued communication with members of the *Moroccan Plant and Livelihoods Specialist Group* (a sub-group of the IUCN Mediterranean Plant Specialist Group) who are case study leaders. Simultaneously, to assist the Moroccan government as it implements the GSPC, the project has contributed to the global and Moroccan database of plant species (Target 1) by collecting data from floristic studies and creating a database of the collections (1000 items) from the two sites using BRAHMS (Botanical Research and Herbarium Management System). These activities contribute to our ongoing commitment to supporting Morocco as it fulfils its commitments to the GSPC. Simultaneously, we maintain continued communication with the government agencies responsible for producing the NBSAP and reviewing the GSPC targets.

3.2 Progress towards project outputs

Overall, progress towards project outputs has proceeded as planned.

Regarding output 1, this period we have progressed towards generating an "Understanding of change in abundance, distribution and harvest of 10 species of medicinal roots and in overall plant diversity" through the production and partial publication of 11 conservation assessments of medicinal root species (*Ammoides pusilla*, *Anacyclus pyrethrum*, *Aristolochia paucinervis*, *Bunium bulbocastanum*, *Carlina gummifera*, *Corrigiola litoralis*, *Corrigiola telephiifolia*, *Ferula communis*, *Mandragora autumnalis*, *Silene vulgaris*, and *Valeriana tuberosa*) along with

endemic plant species. See Annex 7 for a more complete report of this aspect of the project. We also started collaborative field-based floristic and ecological studies.

We are well advanced in output 2's "Participatory planning […] in two townships, generating socioeconomic and environmental data to assist community decision-making […] and delivering a comprehensive assessment of livelihood impacts by project end". Environmental data is assured by activities under output 1, particularly the ecological surveys. Limited available socioeconomic data has been supplemented by a socioeconomic survey (completed in Imegdale, underway in Ait M'hamed), and we are in the initial stages of a collaborative ethnographic evaluation of project impact on socio-ecological wellbeing in both townships.

Progress towards output 3 is well underway: fruit and nut nurseries have significantly expanded in both communes, and saplings are undergoing grafting to ensure production of marketable nuts. Medicinal plant nurseries have been/are currently being set up in both townships. Numerous training activities have been implemented, with a special focus on intensive capacity-building for value-adding and marketing of produce.

Regarding output 4, we implemented a stakeholder workshop on GSPC implementation, which has kick-started the efforts of members of the Moroccan Plants and Livelihoods Specialist Group to produce case studies for the GSPC. Communications with relevant government agencies regarding the implementation of the GSPC in Morocco are ongoing.

3.3 Progress towards the project Outcome

The project is making significant progress towards the planned Outcome. Conservation assessments have been completed, sustainable harvesting approaches are being developed, cultivation of medicinal plants and roots is underway, and conservation measures are being developed and refined with partner communities. More specifically, given the rapid rate of expansion and enrichment of the community tree and medicinal plant nurseries, accompanied by the intensive capacity-building in value adding, cooperative management and commericalisation of produce provided to community members, we are very satisfied with the potential for the project to contribute to community incomes and livelihoods. The ongoing development of enrichment planting and appropriate harvesting techniques, specifically of the highly valued *Anacyclus pyrethrum* medicinal plant root, is expected to yield positive results regarding wild populations in and around community territories (i.e. in Important Plant Areas of the High Atlas mountains). While we cannot expect these positive results to be available for measurement in the short term, in year 2 we have implemented intensive, participatory floristic and ecological surveys of these areas in order to establish a sound baseline for impact assessment. Through project efforts (notably the GSPC workshop and current GSPC case study follow-up), government, non-government, academic and private stakeholders are well versed in the GSPC and the importance of its implementation. We expect this to produce nondirect benefits through policy changes at the national level within the next few years. Finally, individual capacity has been at the centre of project activities this year, through the GSPC workshop, and more importantly through the establishment of the 'membership' NGO, the *Moroccan Biodiversity and Livelihoods Association,* which already regroups 5 emerging and dynamic young Moroccan researchers and practitioners interested in furthering conservation-cum-livelihoods processes in rural Morocco, with a view to recruiting more through various networking opportunities.

The outcome indicators (1) assessment of conservation status, (3) marked decrease in population loss of target species, and (5) creation of a multi-institutional partnership have proven to be adequate for measuring outcomes.

However, we have given a great deal of reflection to outcome indicator for outcome (2) "annual income from trade in roots increase by 50% for 200 households of medicinal plant collectors, and annual income increases by 10% - 20% for another 800 households, reducing poverty levels by year 3", deciding that strict economic measures for assessing project impact do not provide us, or the Darwin Initiative, with the full picture of the consequences and effects of the project on human wellbeing. Recently GDF opened a discussion with Jami Dixon – research associate at LTSI and leader of the Darwin Initiative review of its impact in biodiversity conservation and poverty alleviation – on the topic of appropriate and concrete measurements

and indicators of project impact, particularly on poverty alleviation. This discussion drew upon the Poverty Learning Note prepared by the Darwin Initiative that recognizes that many applicants are struggling to demonstrate how they capture positive changes to the relationship between biodiversity conservation and reduced poverty. A key point of agreement between the Darwin Initiative and the Global Diversity Foundation – in this project and many other aspects of its work – is that is poverty alleviation cannot be measured in solely monetary terms, especially in local and indigenous communities. The note suggests that poverty alleviation can be 'measured and understood', and we recognize that the latter requires a qualitative and ethnographic approach in addition to any attempts at measurement.

Our current indicator for outcome (2) was developed to respond to the Darwin Initiative's stated interest in monetary measures to evaluate impact on poverty alleviation. However, as our project has progressed, and in light of lessons learned in our recently closed Darwin Initiative-funded post-project in Mexico and other recent reflections, we have recognised the importance of a more holistic and realistic approach to assessing project impact. We have found that our projects often have significant non-quantifiable impacts such as (a) empowerment of community members through capacity-building, (b) improved connectivity and communications between communities and locally supportive organisations and agencies, (c) production of significant empirical data (e.g. ethnobotanical, ecological, socioeconomic) that can be directly used by communities to elaborate endogenous development projects, (d) maintenance of existing food security, traditional knowledge, sustainable plant populations that are useful for health and nutrition, and local governance systems that ensure social and cultural wellbeing. We feel that an ethnographic, qualitative and narrative approach is the most appropriate for describing project impacts in these non-quantifiable domains. Therefore, we suggest that our indicator for outcome (2) would be more adequate if it read "increase in annual income of community members by 10-20% in 1000 households and maintenance or improvement in subjective and collective wellbeing as described by community members"

For outcome (4), we feel that one element of our indicator, namely "GSPC embedded in the NBSAP by year 2" is too narrow for a 3-year project. While government representatives are very enthusiastic about the project and its potential for supporting their work towards embedding the GSPC in the NBSAP, the slow nature of government processes in Morocco is unlikely to yield the integration between GSPC and NBSAP that we had hoped for at the outset of the project. A better indicator might have been "at least 10 case studies submitted to the GSPC and to the Department for Environment's NBSAP review office for consideration in the next NBSAP review" as this is feasible and a practical and tangible step towards integration of the GSPC in the Moroccan NBSAP.

3.4 Monitoring of assumptions

In terms of outcome assumptions, these all still hold true. (1) Sufficient data has been available through scientific literature, field research and stakeholder consultation to complete conservation assessments, both promised and additional. Consensus on measures to reduce overexploitation has been reached by project partners. (2) Academic institutions have provided expertise and field research, and even though we expressed some doubt in our previous report, we have now found 3 capable students from Cadi Ayyad University as well as motivated community researchers in partner communities who have supported the ecological surveys and floristic inventories. (3) Governmental and communal authorities granted land and authorisation for nurseries, and provided permission for research, monitoring and evaluation in yr 1 of the project. (4) Community members, with strong support from community researchers, have shown motivation to manage and tend nursery seedlings and saplings and in reducing overexploitation of overharvested and endangered species through enrichment planting adopting new harvesting techniques and practices. (5) Stakeholder (including government) commitment to the implementation of the GSPC and integration into the NBSAP is maintained, with evidence from the GSPC workshop held in yr 2 of the project. (6) Stakeholders are active in the Moroccan Plants and Livelihoods Specialist Group, and a subset of individuals have partnered up to establish the NGO Moroccan Biodiversity and Livelihoods Association in December 2014 to continue with the project's work beyond the 3 years.

One output assumption could be slightly altered: under output 1, we were finally successful in finding 3 diligent, motivated and capable students to support research processes in year two (in yr 1 we reported a dearth of interested students to support project research). However we had hoped for more interest and motivation on the part of Cadi Ayyad University students. On the other hand, we are happy to report that we have recruited 6 highly motivated community researchers (2 women and 4 men in total) in our partner communities, four of whom have university degrees and are investing significant time and effort in supporting field research processes. Our assumption could have included these community researchers to be more complete.

Under output 2, we have learned that another assumption would have been useful to include: that of the availability of good socioeconomic data from which to construct a baseline for subsequent impact assessment. This was not the case, meaning that we have had to complement existing limited data with further surveys. However, this gap has also motivated us to move beyond simple measurement of economic indicators as a source of data for impact assessment, towards the elaboration of a more progressive, comprehensive and ethnographic approach to assessing improvements in socio-ecological wellbeing as a result of the project.

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

The project contributes to the higher goal of biodiversity conservation and poverty alleviation through the development of:

(a) New knowledge regarding conservation status of key plant species in Important Plant Areas of Morocco. Expanding our knowledge of plant conservation status is essential for developing targeted conservation measures and establishing a baseline upon which to assess the impact of these measures. This has been achieved through the creation of 11 conservation assessments of medicinal roots.

(b) Development of locally appropriate sustainable management plans and conservation measures for threatened plant species in Important Plant Areas. Hassan Rankou and Abderrahim Ouarghidi have been working in close collaboration with community researchers to establish these conservation measures, including training in sustainable plant and seed collection practices, seed propagation of useful species (including threatened species) in nurseries, monitoring of plant conservation status in the wild, piloting of protected enclosures within community territories, and enrichment planting.

(c) Support for local livelihoods and establishment of sustainable, reliable sources of (currently unsustainably harvested) plant material in rural communities whose poorest members are over-exploiting threatened plant species. This is being implemented through the management and expansion of plant nurseries for fruit and nut trees and MAPs, as well as enrichment planting, especially of the endangered high income medicinal plant root *Anacyclus pyrethrum.* Through the value-adding and sale of this fruit/nut produce and medicinal and aromatic plants, households in partner communities are set to increase their annual income.

(d) We believe achievement of the project's impact cannot rely solely on income increases, therefore we also seek to improve community wellbeing through (i) empowerment of community members and community researchers through training and sharing decision-making and responsibilities in project implementation, (ii) strengthening and supporting traditional plant management practices, and (iii) providing opportunities for mutual learning and exchange with other Amazigh communities in the region.

4. Project support to the Conventions (CBD, CMS and/or CITES)

One of the explicit objectives of the project is to assist the Moroccan government as it implements the Global Strategy for Plant Conservation (GSPC), contributing to its revision and implementation of the National Biodiversity Strategy and Action Plan (NBSAP) and to achieving specific Aichi targets.

In terms of the GPSC, the project specifically seeks to support its implementation in Morocco by:

(i) Contributing to the global and Moroccan database of plant species (Target 1). This is being done by collecting data from floristic and ecological surveys. During this reporting period, 1000 herbarium specimens were collected, identified and submitted to national, regional and local herbaria.

(ii) Providing assessments of the conservation status of plant species (Target 2). To date, Dr. Hassan Rankou has produced 11 conservation assessments of medicinal roots, and additional ones of Moroccan endemic monocotyledons, published as an article in the *Botanical Journal of the Linnaean Society.*

(iii) Creating a Moroccan Plants and Livelihoods Specialist Group that provides a platform for governmental and non-governmental institutions, individuals and organisations interested in the conservation of Moroccan biodiversity to work cohesively towards plant conservation (Target 16). As mentioned in the previous report, the MPLSG was created in May 2013 and welcomed by the IUCN Species Survival Commission as a formal sub-group of the IUCN Mediterranean Plant Specialist Group. The MPLSG is set to work closely with Moroccan government agencies to strengthen the implementation of the GSPC at the national level and embed it into the NBSAP; it also establishes a forum for participation and information-sharing in the implementation of the GSPC (Target 3).

(iv) Supporting the establishment of the Moroccan NGO *Moroccan Biodiversity and Livelihoods Association,* which will work to expand plant conservation and sustainable livelihoods work in Morocco (Target 16).

(v) Reducing the pressure on wild-harvested medicinal plant species through income-generating projects in communities who collect medicinal plants for a living (Target 11). Income-generating activities – the establishment of plant nurseries and enrichment planting – are well underway in both field sites.

(vi) Contributing Moroccan case studies to the GSPC. At least 10 case studies for the GSPC are currently being finalised for submission in 2015-2016.

There are a number of specific Aichi biodiversity targets that this project addresses directly (2; 7; 9; 11; 12 and 13). However, in this first reporting period, we have specifically focused on Target 2 – assessing the conservation status of plant species to guide conservation action (see above on Dr. Hassan Rankou's work) – as all of the other targets to be addressed require this as a baseline and will be tackled in years 2 and 3.

As mentioned in the previous report, three of the CBD Moroccan National Focal Points noted on the CBD website (http://www.cbd.int/countries/nfp/?country=ma) are involved in our project. Prof. Mohamed Fennane, our main project partner, has been the National Focal Point (NFP) for the CBD's Global Strategy for Plant Conservation for Morocco. He was directly involved in the kick-off workshop and is a principal contributor to Year 2's workshop on the GSPC. Prof. Fennane has also provided institutional support to Dr. Hassan Rankou, the projects' conservation assessment and red-listing consultant, on the development of the conservation assessments of 10 species of medicinal plant roots and other endemic and medicinal plants. Dr Fennane is in the process of stepping down as NFP for the GSPC, turning the role over to Dr Abdelkader Taleb of the Institut Agronomique et Vétérinaire Hassan II, who participated in our GSPC workshop.

Another project partner, Dr. Mostafa Madbouhi, is NFP for the Clearing-House Mechanism and for Access and Benefit Sharing and the Intergovernmental Committee for the Nagoya Protocol. He represents Mme Latifa Lakfifi, CBD National Focal Point, in the project. Among his

responsibilities in the Department of Environment is the reformulation of Morocco's NBSAP. The Moroccan Plant Specialist Group, formed in Year 1 of the project, will be instrumental in gathering data and information to feed in to the process of revision of the NBSAP. A third *de facto* partner, Mohammed Ribi was the Protected Areas National Focal Point for Morocco. In Year 1 of the project, Mostafa Madbouhi participated in the project's kick-off workshop in May 2013.

5. Project support to poverty alleviation

As mentioned in the previous report, it is too early to show evidence that the project is working to alleviate poverty. However we have described above the creation of the plant nurseries, and the successful germination of tens of thousands of almond and walnut seeds, as well as the establishment of medicinal and aromatic plant nurseries which will shortly include highly valuable medicinal root species such as *Anacyclus pyrethrum.* We have also described ways in which the project contributes to social wellbeing beyond income increases: through empowerment (especially of the 6 community researchers who take on significant responsibility for their communities and the project), participatory decision-making, maintenance of traditional knowledge and food security, and production of empirical data for improved local decision-making (see also point 3.3).

The immediate beneficiaries are the over 27,000 Amazigh people in more than 4000 households in 64 villages of two rural communes, described in more detailed in section 1 - Project Rationale. As noted in last year's report, we hope to achieve direct impacts by building on proven income improvement strategies, such as the production of fruit and nut saplings distribution to households that have available land and labour, and medicinal and aromatic plants for sale through the community cooperative. Given the long lead-up time to the actual production of saleable produce, we cannot speak of immediate poverty alleviation. However, fruit and nuts and medicinal plants are proven and reliable sources of income for many High Atlas communities, including both project partner communities. Furthermore, in order to enhance post-harvest processing, value-adding and marketability of this produce, this year we have engaged in intensive capacity-building with local cooperatives and community members, which we are convinced will bear fruit in terms of enhancing local incomes from produce sale, thus directly contributing to poverty alleviation.

6. Project support to Gender equity issues

This project does not directly address gender equity, so any impacts on gender equity would be indirect. However we work ensure that our project approach encourages the participation of women and improvement in their livelihoods, while respecting the customs and practices of our partner communities. We have been successful in training 1 woman as a full member of the community research team in each partner community, and they have a special role in engaging with other women in their communities to ensure that applied research results are gender-balanced. An additional woman is being trained as a community researcher in Imegdale, and two in Ait M'hamed, to carry out socioeconomic research for the project. In addition, the Ait M'hamed cooperative that is currently being trained by HAF to market walnuts produced by the community is a women's cooperative. Given the challenges of working directly with women or on gender issues in the conservative society of the Amazigh communities in the High Atlas and Morocco more generally, we consider these successes significant.

7. Monitoring and evaluation

As mentioned in the previous report, monitoring and evaluation of achievements is built in to the very structure of the project. The first year of the project has been dedicated to establishing socio-economic and environmental baselines upon which to measure the progress of project activities. Our indicators of achievement are therefore, to a large extent, planned for fulfilment by the end of the project.

During this reporting period, the conservation assessments of 30 endemic and threatened species of monocotyledons have been published, and 11 conservation assessments of medicinal roots have been finalised and are in press. The only conservation assessment still in process with minor revisions is that of *Anacyclus pyrethrum,* which requires data on population trends, which is currently being produced through the ecological monitoring process in Ait M'hamed (see point 3.5). These conservation assessments provide us with a baseline upon which to assess changes in abundance and distribution of these roots at project's end. The floristic and ecological monitoring described in point 3.1 is both an integral part of the project as well as an in-built project monitoring system. The establishment of the Linear Intercept Transects will allow us - in yr 3 and beyond - us to monitor and compare changes in plant abundance and diversity in project-enclosed areas and normally utilised areas, providing an indication of our success in reducing over-harvesting and -grazing of medicinal plant roots.

A preliminary socioeconomic baseline has been established, with a view to assessing changes over time in basic assets and infrastructure by the project's end. However our evolving approach to evaluating our project's impact on livelihoods means that we are engaged in a more thorough process to examine the project's outcomes in terms of wellbeing. This includes the implementation of a detailed questionnaire and ethnographic interviews, as well as ongoing monitoring of community satisfaction with the project through informal interviews and participatory community discussions.

On a day-to-day basis, the project's progress is monitored by the steering committee, which is composed of representatives of 5 institutions: Dr Gary Martin for GDF, Yossef Ben-Meir for High Atlas Foundation, Prof. Mohamed Fennane for the Institut Scientifique, Prof. Ahmed Ouhammou for Cadi Ayyad University, and Mostafa Madbouhi for the Environment Department. The steering committee has met four times since the inception of the project, including in a project meeting organised for Rabat-based partners on 4 February 2015. During these meetings, partners discussed progress in project implementation, gaps in implementation, project outcomes and the participation of all partners in the project. All project partners were pleased with project progress, in particular the co-authored publication of conservation assessments in the *Botanical Journal of the Linnaean Society* and the IUCN database of threatened species. A joint meeting with Resing about the Darwin Initiative and CEPF projects was organized on 18 April 2015, just after the current reporting period. A follow-up steering committee meeting is planned for early September 2015.

Most significantly, Dr. Alain Cuerrier from the Montreal Botanical Gardens agreed to act as internal project evaluator since the project's inception. In May 2015 he travelled to Morocco to carry out a thorough internal project review. He has provided keen insight and support to the project through three field visits (2013, 2014 and 2015) and continuous discussions since the start of the project. Following his second field visit at the end of May/beginning of June 2015, Alain will provide a mid-term evaluation that describes (1) his experience, visits and encounters during this field visit, (2) his assessment of GDF's efforts and ability to fulfil the terms and expectations of the grant and (3) his reflections about the future potential of the project and its legacy.

8. Lessons learnt

One of the areas of complexity in this project has been to develop an appropriate and progressive approach to assessing the socioeconomic impact of the project. Keen to move beyond the habitual, basic indicators related to household income and lacking appropriate baseline data, we recognised the need to broaden our approach assessment of project impact on livelihoods to a more holistic understanding of evolving wellbeing in partner communities. To do so, we are in the process of implementing a more intensive and comprehensive ethnographic exploration of the project's local importance (see points 3.1 and 3.3)

Another lesson we have learned is the importance of having an internal project assessor who knows our team and collaborators and therefore can provide a knowledgeable yet alternative perspective on project progress and impacts. We have been fortunate to have such a reviewer in Dr. Alain Cuerrier from the Montréal Botanical Gardens (see point 7), with whom project

leader and GDF Director Gary Martin, GDF's Regional Programmes Director Emily Caruso, Hassan Rankou and Abderrahim Ouarghidi were able to interact personally at great length during his June 2015 field visit. Alain's interim external evaluation is provided in Annex 8, but even this rich document does not fully capture his more extensive role in mentoring young researchers in the field, and the insights that he shares with the project coordinators during his visits to Morocco.

An interesting development that has opened our eyes to an opportunity for work on plant conservation and livelihoods in Morocco is the return of talented Moroccans to their country after extended periods abroad for study and work. This 'return of the diaspora' is re-energizing the conservation movement by incorporating people with new insights, networks and skills who are multilingual and multicultural. For example, Hassan Rankou, an Anglo-Moroccan who works halftime at the Royal Botanic Gardens, Kew and halftime with GDF on the Darwin and other projects, brings expertise in plant conservation as a IUCN specialist in redlisting. GDF recently formalized his role by appointing him as Regional Coordinator for the Mediterranean. Abderrahim Ouarghidi, who pursued opportunities in Canada and Indonesia after finishing his doctorate, has returned to Morocco to work halftime with the High Atlas Foundation and as a consultant with GDF. Hasnaa Benlafkih, who worked in New York City after completing her undergraduate degree in the United States, uses her multidisciplinary background in environmental sciences and fluency in English, French and Arabic in her role as GDF's Programme Manager in Morocco. We have learned to provide opportunity for these returning Moroccan colleagues, and to integrate them into our growing team when possible.

Finally, through a parallel project funded by the Critical Ecosystems Partnership Fund, we have realized the importance of taking into account water in various aspects of the project. The study conducted by our partner Resing has underlined that scarce and diminishing supplies of water are a potential limiting factors in the success of community plant nurseries, fruit and nut trees plantations and enrichment planting, and also plant conservation efforts. We are soon starting a participatory water action plan to formulate community-based responses to this challenge.

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

Last year, the report reviewer specifically asked for more information on:

1. potential markets for produce emerging from the nurseries
2. how the seedlings are to be allocated within the communities
3. correct harvesting from the wild and enrichment planting
4. day-to-day project management.

Most answers have been integrated into the previous text. Specifically, as regards (1) in year two, we worked specifically on the creation and capacity building of local cooperatives, and establishing mutual learning for these cooperatives with other established associations engaged in commercialisation of produce (see point 3.1). In year 3, we will work to consolidate the relationships between our partner communities' cooperatives and local and regional markets. For point (2), we described how seedlings were allocated in the communities under point 3.1. In response to comment (3) although we have been able to provide an initial workshop on best practices in MAP harvesting (specifically thyme and lavender) in Imegdale, we began the process of training in correct harvesting from the wild and enrichment planting of *Anacyclus pyrethrum* in Ait M'hamed at the beginning of year 3 (April 2015). This process will be developed throughout the course of yr 3 as we seek to establish and expand medicinal root nurseries in both communes.

As regards day-to-day project management (point 4), we provide a brief description here. GDF Director Gary Martin oversees and coordinates the project and its relationship with the Critical Ecosystem Partnership Fund co-funding project. He lives in Marrakech and is therefore able to meet with partners (particularly the HAF team and the team from MARK/Cadi Ayyad University) and to travel relatively frequently to the field sites for supervisory visits. Dr. Martin ensures that the project runs smoothly and coordinates the schedule of activities with all partners. Hassan Rankou, the project's plant conservation and ecological monitoring specialist is based at RBG

Kew but travels frequently to Morocco to engage in fieldwork in Imedgale and Ait M'hamed, to work with Professor Ouhammou and students from Cadi Ayyad University, and to coordinate MBLA activities. Abderrahim Ouarghidi, who represents both HAF and GDF in this project, takes charge of the socioeconomic and participatory aspect of the project, including coordinating with Ait M'hamed for the development of plant nurseries. He lives mostly in Marrakech and is able to travel frequently to the fieldsites for fieldwork and supervisory visits. Mohamed el Haouzi, the project's field coordinator, is based in Marrakech and collaborates with Larbi Didouquen from HAF to oversee the day-to-day running of field activities including the development and management of plant nurseries, community researcher's activities, and implementation of capacity-building workshops. Hasnaa Benlafkih, who replaced GiGi Saadani as project manager, provides logistical support and – drawing on her ability to interact in Arabic, Amazight, English and French – contributes to project reporting. Emily Caruso, who is based in Italy, provides additional project management support and travels once a year to Marrakech for field visits and to meet with partners.

All partners involved in the project communicate regularly through email, Skype and in person in order to ensure the project runs smoothly and activities are completed in time. Gary Martin, Emily Caruso, Hassan Rankou and Abderrahim Ouarghidi collaborate to provide the intellectual leadership of the project and to develop grants to continue the work begun with the Darwin Initiative project. In 2014, co-funding from the Critical ecosystem Partnership Fund (CEPF) was secured for a complementary project on water management for biodiversity conservation and local livelihoods in Imedgale and Ait M'hamed, and the same partners and individuals have carried over their roles in this project, thus further consolidating the team and its internal function.

10. Other comments on progress not covered elsewhere

We apologise for the delay in submitting this report, and have taken action to submit future reports on time. Most notably, we have asked our new GDF Morocco Programme Manager, Hasnaa Benlafkih, to debrief project partners on a regular (monthly or quarterly) basis to ensure they provide us with timely and detailed information we need to fulfil our commitment to write reports collaboratively and submit them on time. Based on this dialogue with partners, she will be writing summary reports of activities soon after they finish, and will be part of our growing communications efforts.

11. Sustainability and legacy

This year, one of the key outcomes in terms of legacy has been the creation of the Morrocan Biodiversity & Livelihoods Association (MBLA), a unique organisation in the country, which gathers dynamic young Moroccan researchers and practitioners (who are all engaged in the Darwin Initiative project, including our project botanist Hassan Rankou and social and ecological scientist Abderrahim Ouarghidi) with a view to engaging both in grass-roots conservation and livelihoods work with rural communities, as well as working at the national level to support Moroccan efforts to both improve and implement new policies regarding biodiversity conservation and to ensure it is fulfilling its international commitments in terms of biodiversity and human wellbeing.

The GSPC workshop held at the start of Year 2 helped to consolidate both the Moroccan Plants and Livelihoods Specialist Group and the work of its members in fulfilling Moroccan commitments under the GSPC (specifically through the development of GSPC case studies). With a view to building Moroccan capacity, we will also be implementing a workshop early in year 3 in support of emerging Moroccan researchers and practitioners both in terms of their expertise and networks (to be reported on next year). We are also planning to intensify our collaboration with Prof. Ahmed Ouhammou and his students (who are some of the founding members of MBLA) as we consolidate our financial and logistical support for the Cadi Ayyad herbarium and related field activities.

In addition, as mentioned in the previous report, because broader impact will take significantly longer that the three years of Darwin funding, our project is designed to be readily scalable to a national level. We are currently working on grant proposals that are specifically designed to

consolidate our approach and pilot it elsewhere. We have found that combining the Darwin Initiative-funded agroforestry and biodiversity work with water management (hydrology) activities, funded under the Critical Ecosystem Partnership Fund grant, is an excellent strategy, given that water management issues are a limiting factor for agroforestry and biodiversity conservation in the High Atlas. We are therefore developing grants for a combined agroforestry-biodiversity-hydrology strategy to be consolidated and applied elsewhere in the High Atlas, thus responding to our commitment to ensure our approach under the Darwin Initiative is scalable at national level.

12. Darwin Identity

Despite the relatively small amount of Darwin Initiative grants awarded for work in Morocco since the inception of the programme, it is relatively well known among people involved in biodiversity research and conservation. The GSPC workshop described above was an opportunity to reinforce this public recognition. Many of the stakeholders were already familiar with the Initiative because they had received or collaborated on Darwin grants in the past, and this includes people who hold influential positions in academia and the government. In a presentation in the workshop, our Darwin Initiative support was portrayed as funding for a distinct project with a clear identity. In the context of training events at Cadi Ayyad University, the Darwin Initiative was explained to Biodiversity master students. The Darwin Initiative logo was used in presentations, and the Darwin Initiative was thanked in the *Botanical Journal of the Linnaean Society* publication on conservation assessments of endemic monocotyledons lead-authored by Hassan Rankou. We are currently working on a series of short videos on various aspects of the project that we will upload to YouTube, embed on our website and link to the Darwin account.

13. Project Expenditure

Please expand and complete Table 1.

Table 1 Project expenditure during the reporting period (1 April 2014 – 31 March 2015)

Project spend (indicative) since last annual report	2014/15 Grant (£)	2014/15 Total Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)				N/A
Consultancy costs				N/A
Overhead Costs				N/A
Travel and subsistence				N/A
Operating Costs				N/A
Capital items (see below)				N/A
Others (see below)				Slight overspend for plant collecting and herbarium plant mounting, catching up on delayed floristi inventory
TOTAL	87,450	88,857		

Highlight any agreed changes to the budget and **fully** explain any variation in expenditure where this is +/- 10% of the budget. Have these changes been discussed with and approved by Darwin?

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

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

We will be in a better position to report an outstanding achievement, we hope, in the final report.

Annex 1: Report of progress and achievements against Logical Framework

Project summary	Measurable Indicators	Progress and Achievements April 2014 – March 2015	Actions required/planned for next period
Goal/Impact Drawing on Indigenous knowledge and practice, Moroccan medicinal plants are sustainably harvested and profitably cultivated, strengthening the ecological integrity of Important Plant Areas, subsistence practices of millions of rural and urban herbal remedy users, and commercial trade that improves livelihoods of thousands of collectors, vendors and traditional practitioners. Morocco incorporates the Global Strategy for Plant Conservation in its revised NBSAP and makes substantial progress on all five GSPC objectives, contributing to its efforts in achieving the Millennium Development Goals of halving poverty, improving health and enhancing environmental sustainability by 2015, and meeting Aichi Biodiversity Targets by 2020.		Ongoing steps towards the sustainable use of medicinal plants in Morocco have been taken: baseline floristic and ecological surveys have been carried out and ongoing ecological monitoring is underway. Socioeconomic research is being carried out that will help assess the overall impact of the project on community wellbeing. Plant nurseries housing tree and Medicinal and Aromatic Plant (MAP) seedlings are growing and successful, contributing to the future livelihoods of partner communities and establishing a best practice model for scaling up at the national level. The importance of the GSPC has been communicated with relevant government agencies and the development of a robust contribution by Morocco has begun. The Moroccan Biodiversity and Livelihoods Association has been established by emerging young scientists and practitioners in Morocco with a view to ensuring project legacy.	[redacted]
Purpose/Outcome Conservation assessment, sustainable harvesting, cultivation and protection of ten wild-crafted medicinal roots in two High Atlas Amazigh townships contributes to: • viable income increases for medicinal plant collectors and supplementary livelihood benefits	(1) Assessment of the conservation status of ten wild-harvested medicinal roots includes perspectives of diverse stakeholders by year 2 leading to implementation of specific measures to reduce overexploitation by year 3; (2) In two participating townships, annual income from trade in roots increase by 50% for 200 households of	(1) 11 conservation assessments finalised; publication of the conservation assessments of the Moroccan endemic monocotyledons flora published in the *Botanical Journal of the Linnaean Society.* Community researchers receiving ongoing capacity-building for monitoring and conservation measures.	(1) Development of specific measures to reduce overexploitation of wild-harvested medicinal roots, including seed collecting, propagation, enrichment planting and medicinal root nurseries. Publication of a paper on the conservation status and trends of High Atlas plants. (2) management of the nurseries will

for other community members • conservation of vulnerable plant species in protected areas, forest domains and *agdals* (community conserved areas) leading to effective management and governance of genetic, species and landscape diversity in Important Plant Areas representative of unique High Atlas Mediterranean vegetation types; • nondirect benefits from Moroccan policy changes related to the Global Strategy for Plant Conservation; • building of individual capacity and multi-institutional partnerships on conservation and sustainable livelihoods.	medicinal plant collectors, and annual income increases by 10% - 20% for another 800 households, reducing poverty levels by year 3. (3) Marked decrease in population loss of target species in sampled transects in *agdals*, forest domain and protected areas accompanied by maintenance of overall floristic richness of Important Plant Areas and increased cultivation of medicinal plants by year 3; (4) GSPC embedded in the NBSAP by year 2 and progress in achieving the general objectives and specific targets of the GSPC by year 3. (5) Creation of a multi-institutional partnership by year 1 creates increased dialogue among at least 25 representatives of academic institutions, government agencies and non-governmental organisations by year 3, resulting in consensus on conservation action.	(2) Medicinal plant nurseries have been established in both communes and enrichment planting of *Anacyclus pyrethrum* has begun. Nursery production of walnut and almond trees is successful; community researchers are actively managing the nurseries with support from other community members. Community associations have received capacity building for adding value and marketing their production. (3) Floristic studies and ecological surveys are ongoing in collaboration with community researchers. Nursery production records are ongoing. All academic institutions and individuals are willing and active in this element of the project. (4) A stakeholder workshop on implementing the GSPC; communication with government agencies responsible for producing the NBSAP and reviewing GSPC targets in Morocco is good. (5) multi-institutional partnership, the *Moroccan Plant and Livelihoods Specialist Group* was formed in year 1 and continues to be active. The NGO *Moroccan Biodiversity & Livelihoods Association* was created in December 2014 to ensure sustainability of project objectives.	continue, and there will be a broader focus on propagation of local useful plants. Sustainability of the nurseries in the post-project will be sought through continued collaboration with HAF and additional fundraising. (3) based on ongoing floristic and ecological surveys, assessment of the impact of conservation measures will begin. In-depth ethnographic research on the livelihoods impacts of the project will be launched and completed. (4) A third stakeholder workshop for emerging scientists will be organised on the topic of best practices in biodiversity conservation and livelihoods in Morocco. (5) the MBLA will fundraise to implement plant conservation and local livelihoods projects in Imegdale, Ait M'hamed and further afield.
Output 1. Understanding of change in abundance, distribution and harvest of 10 species of medicinal roots and in overall plant diversity of communal lands, forest domains and protected areas in two rural townships	Baseline studies of abundance, distribution and harvest of medicinal root species produced by yr 1 and reviewed by relevant members of the steering committee Overall plant diversity surveys of communal lands, forest domains and protected areas near two rural	Dr. Hassan Rankou produced conservation assessments of 11 medicinal root species, constituting the baseline studies of abundance, distribution and harvest. Given a delay in launching the field studies (as a result of tardy arrival of the first tranche of DI funding), floristic and ecological studies began in Yr 2, and completion is planned for year 3. At both sites, floristic studies included site studies (review of literature, study of the area, topography, geological features, climate, vegetation), herbarium studies (specimen study, creation of a database) and community inventories (plant collection, creation of local herbaria). Ecological	

	townships completed over two seasons by yr 2 and reviewed by steering committee Changes in abundance, distribution and harvest of medicinal roots and overall plant diversity documented by yr 3 Conference on ethnobotany, plant diversity and ecology hosted by Herbarium Club at Cadi Ayyad University for students, researchers and other stakeholders in yr 3 Paper on change in medicinal root harvesting and plant diversity under different governance scenarios submitted for peer review by yr 3	monitoring was established using Line Intecept Transects and creating a protected enclosure for assessing the effects of grazing on plant diversity and density. Local researchers were trained in herbarium techniques, mounting herbarium specimens and collecting plants in the field. So far, almost 1000 species have been collected, identified and submitted for curation in national, regional and local herbaria. Community researchers are continuing with collection and the development and consolidation of local herbaria. A paper that analyses the results and data of the conservation assessments carried out as part of this project has been submitted to *Conservation Biology.*
Activity 1.1. Baseline studies of medicinal roots produced		11 conservation assessments of medicinal plant roots and other important local flora produced.
Activity 1.2. Initial plant diversity surveys completed		Initial floristic and ecological surveys completed in Ait M'hamed and Imedgale. Ecological monitoring system established for participatory monitoring by community researchers in both communes.
Output 2. Participatory planning conducted in two townships, generating socioeconomic and environmental data to assist community decision-making throughout the project cycle and delivering a comprehensive assessment of livelihood impacts by project end	Compilation of existing socio-economic and environmental assessments by middle of yr 1 Baseline surveys conducted by end of yr 1 used to update existing data and explore trends Community evaluation of participatory planning conducted by middle of yr 2 reviewed by steering committee Working paper on change over time in socio-economic and environmental parameters submitted to Department of Environment and High Commission on Water and Forest by yr 3	As mentioned in the year 1 report, available socio-economic and environmental data was limited, meaning that more effort was required to establish baselines, specifically for the socioeconomic panorama. In yr 2, a basic socioeconomic survey was carried out. Given our desire, mentioned in the yr 1 report, to move beyond assessments based on simple economic measurements towards a more holistic evaluation of project impact based on ethnographic studies of socio-ecological wellbeing, this element will be ongoing throughout the project rather than a comparison between a baseline scenario and an end-project scenario. For this purpose, training of community researchers in two communes was carried out to implement a more comprehensive, ethnographic approach to socioeconomic data gathering has begun. Given this change in approach, the community evaluation of participatory planning has been shifted to year 3 for revision by the steering committee. Similarly, it is likely that the working paper will be written after the final yr 3 data is collected.
Activity 2.1. Socio-economic and environmental assessments compiled		Existing socio-economic and environmental assessments were compiled in yr1.

Activity 2.2. Baseline surveys conducted		Basic socioeconomic baseline data was collected in Imegdale and is being collected in Ait M'hamed. Ecological monitoring has begun in both communes: ecological baselines have now been established for further monitoring in the future.
Output 3. Two community plant nurseries established, leading to production of 40,000 individual seedlings and saplings, and their distribution to 1000 households engaged in terrace cultivation and enrichment planting.	Two nurseries, with 180 m^2 greenhouses, fencing and irrigation installed by yr 1 Production and distribution of a total of 20,000 plants per rural township by yr 3 Overview of periodic supervisory field visits submitted at end of yr 1, 2 and 3; reviewed by steering committee Community exchanges organised among key participants from target rural townships and from the MAP Programme site in the Middle Atlas Income derived from medicinal root trade increased 50% to £450/yr for 200 collector HH; income for 800 HH increased on average by £125/yr (10%-20%) from cultivation and processing of fruits, nuts and orris roots by yr 3 Summary analysis of survival rate of seedlings and saplings compiled by end yr 3	Progress towards this output has taken place as planned, with the nurseries established, planted and irrigated in both townships. A greenhouse in Imegdale was built and covered and now houses thousands of seedlings and cuttings of various species of trees and MAPs. A new nursery has been established for fruit and nut trees and MAPs in Ait M'hamed, and another one specifically for *Anacylcus pyrethrum* has been formally agreed with the community. Diverse training events, including exchanges, workshops and field exercises, covered topics such as valuation of local products, marketing chains, organization of associations and cooperatives to diversity production and gain market access, maintenance of biodiversity and restoration of degraded areas, acclimatizing wild species to cultivation on private plots of land, and familiarization with national agencies involved in landscape management and conservation. As explained in sections 3.1 and 3.3 of this report, we are seeking a more holistic approach to assessing the success of our income-generating activities: we are planning to do so using a more comprehensive, ethnographic approach to evaluating the project's impact on livelihoods and wellbeing and it has begun this year. It remains to be seen whether indicators of income improvement are an appropriate way of verifying the project's success.
Activity 3.1. Nurseries established		This activity has been completed.
Activity 3.2. Seedlings and saplings produced and distributed		In Ait M'hamed, in yr 2, 50,000 walnut seedlings were planted in the main nursery. In Imegdale, in yr 2, 8,000 almond seedlings and 10,000 walnut seedlings have been planted in the nursery. 2089 seedlings of other species (carob, pomegranate, fig, vine, quince, olive and lemon) have been planted in the greenhouse. 4722 plants of medicinal and aromatic species have been planted in the greenhouse. Distribution of the trees from the nurseries established under the Darwin Initiative project has not taken place yet, but a protocol for distribution has been developed in participation with the partner communities. In addition, in February HAF distributed thousands of trees in Imegdale and Ait M'hamed from previously established plant nurseries.

Activity 3.3. Periodic supervisory field visits made		Multiple supervisory visits have been carried out in yr 2. Hassan Rankou and Abderrahim return to the project field sites at least every 2 months, often more frequently. Mohamed El Haouzi and Larbi Didouquen make frequent visits to develop plant nurseries and interact with community researchers. Gary Martin carries out a supervisory visit every 3-4 months, and project internal reviewer Alain Cuerier and GDF Regional Programmes Director Emily Caruso carry out 1 supervisory visit per year.
Activity 3.4. Community exchanges organized		Two community exchanges took place this year, and there were other opportunities and events that facilitated interaction between members of the two rural communes.
Output 4. Policy guidelines developed based on international expertise and practical case studies to advise government agencies and other stakeholders responsible for implementation of the GSCP, NBSAP, National Strategy on MAPs and other instruments related to the environment and sustainable development	Three stakeholder workshops conducted by end of yr 2 Project results disseminated in four international academic and policy venues by end of yr 3 Steering committee established by month 3 leading to formulation of a broader working group on plant conservation Case studies and expert opinions submitted to the Department of Environment, High Commission for Water and Forest and Institut scientifique for inclusion in revised NBSAP, MAP National Strategy and reviews of Important Plants Areas study and GSPC implementation in Morocco by yr 3	Progress on completing this output is ongoing as planned, with a steering committee established early on in the project and two of the three stakeholder workshops completed to date. GSPC case studies have been agreed upon with their authors, and are currently in progress. The project leader presented the project and preliminary results in various venues. The establishment of the Moroccan Biodiversity and Livelihoods Association is an important step towards this output as it gathers local talented and motivated individuals who are dedicating their careers to improving livelihoods and conserving Morocco's plants whilst also supporting their government to implement CBD policy and other international agreements.
Activity 4.1. Workshops conducted		The second stakeholder workshop was implemented on 31 March-1 April in the High Atlas Mountains on the topic of the GSPC.
Activity 4.2. Presentations made		Dr Gary Martin presented an overview of the Darwin project in a session on 'Medicinal plant itineraries: new analytical approaches on the production, trade and use of herbal remedies' at the 14th congress of the International Society of Ethnobiology in Bumthang, Bhutan in May 2014. He presented a paper on 'Medicinal herb flows, plant conservation and local livelihoods in Morocco', in which the Darwin Initiative was acknowledged in a June 2014 conference on Plants and People: material and immaterial resources in trans-regional flows" at Cambridge University. He presented additional results of the project at the World Social Forum in Tunis

	in March 2015, in a session on “Radical Well-Being Alternatives To Development” He discussed the Darwin project in a presentation on “Learning the ropes of applied biodiversity research and poverty alleviation in Morocco” at the Royal Botanic Gardens, Kew in May 2015. He plans to presented more advanced results at the fifth meeting of the Liaison Group for the Global Strategy for Plant Conservation, which will be held at the margins of the seventh European Botanic Gardens Congress (EuroGard VII) in Paris, France, on 8 July 2015. Hassan Rankou gave three one-day seminars: (1) on plant and ecosystem conservation for the biology department in the Marrakech University for 15 MSc and undergraduate students (12/05/2014), (2) on Plant herbarium techniques for the herbarium MARK (10/09/2014), and (3) on implementing the objectives of our Darwin projects with a participatory approach (11/11/2014).
Activity 4.3. Steering committee established, meet regularly	The steering committee was established in May 2013. It is composed of Dr. Gary Martin (Project Leader and Director of GDF), Dr. Mohamed Fennane (Institut Scientifique, Rabat), Prof. Ahmed Ouhammou (Regional Herbarium of the Cadi Ayyad University, Marrakech), Yossef Ben-Meir (High Atlas Foundation), and Mostafa Madbouhi (Environment Department of the Ministry for Water and Environment). It has met three times so far: in May 2013, March 2014 and early April 2015. It plans to meet again in September 2015.

Annex 2 Project's full current logframe

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Goal/Impact Drawing on Indigenous knowledge and practice, Moroccan medicinal plants are sustainably harvested and profitably cultivated, strengthening the ecological integrity of Important Plant Areas, subsistence practices of millions of rural and urban herbal remedy users, and commercial trade that improves livelihoods of thousands of collectors, vendors and traditional practitioners. Morocco incorporates the Global Strategy for Plant Conservation in its revised NBSAP and makes substantial progress on all five GSPC objectives, contributing to its efforts in achieving the Millennium Development Goals of halving poverty, improving health and enhancing environmental sustainability by 2015, and meeting Aichi Biodiversity Targets by 2020.			
Purpose/Outcome Conservation assessment, sustainable harvesting, cultivation and protection of ten wild-crafted medicinal roots in two High Atlas Amazigh townships contributes to: (1) viable income increases for medicinal plant collectors and supplementary livelihood benefits for other community members; (2) conservation of vulnerable plant species in protected areas, forest domains and *agdals* (community conserved areas) leading to effective management and governance of genetic, species and landscape diversity in Important Plant Areas representative of unique High Atlas Mediterranean vegetation types; (3) nondirect benefits from Moroccan policy changes related to the Global Strategy	(1) Assessment of the conservation status of ten wild-harvested medicinal roots includes perspectives of diverse stakeholders by year 2 leading to implementation of specific measures to reduce overexploitation by year 3; (2) In two participating townships, annual income from trade in roots increase by 50% for 200 households of medicinal plant collectors, and annual income increases by 10% - 20% for another 800 households, reducing poverty levels by year 3. (3) Marked decrease in population loss of target species in sampled transects in *agdals*, forest domain and protected areas accompanied by maintenance of overall floristic richness of Important Plant Areas and increased cultivation of medicinal plants by year 3; (4) GSPC embedded in the NBSAP by year 2 and progress in achieving the general objectives and specific targets of the GSPC by year 3. (5) Creation of a multi-institutional partnership by year 1 creates increased	(1) Written conservation assessments for 10 species prepared according to IUCN guidelines; community management plans that specify conservation measures for each species; (2) Socio-economic surveys demonstrating income change and poverty reduction as compared to new and existing baseline studies; (3) Results of ecological surveys, floristic inventories and community-based monitoring; nursery production records specifying number of plants produced and distributed; results from in-field cultivated plant sample survey; (4) 5th national CBD report (due in March 2014) and mid-term review of the GSPC in 2015, both including case studies and recommendations from the Darwin project;	(1) Sufficient data available through scientific literature, field research and stakeholder consultation to complete conservation assessments and reach consensus on measures to reduce overexploitation; (2) Academic institutions provide sufficient expertise, field research and student supervision to achieve ecological surveys and floristic inventories; communities motivated to engage in periodic monitoring; (3) Governmental and communal authorities grant land and authorisation for nurseries, and permission provided for research, monitoring and evaluation; (4) Households motivated to plant and tend seedlings and saplings, continue sustainable harvesting techniques and embrace new practices as necessary; (5) Current level of national government commitment to implementation of GSPC and its integration in the NBSAP maintained throughout project; (6) All stakeholders find common ground

for Plant Conservation; (4) building of individual capacity and multi-institutional partnerships on conservation and sustainable livelihoods.	dialogue among at least 25 representatives of academic institutions, government agencies and non-governmental organisations by year 3, resulting in consensus on conservation action.	(5) Reports from steering committee meetings and stakeholder workshops; roster of participants in all events.	and purpose when establishing action partnership over the course of the project.
Outputs (1) Understanding of change in abundance, distribution and harvest of 10 species of medicinal roots and in overall plant diversity of communal lands, forest domains and protected areas in two rural townships	Baseline studies of abundance, distribution and harvest of medicinal root species produced by yr 1 and reviewed by relevant members of the steering committee Overall plant diversity surveys of communal lands, forest domains and protected areas near two rural townships completed over two seasons by yr 2 and reviewed by steering committee Changes in abundance, distribution and harvest of medicinal roots and overall plant diversity documented by yr 3 Conference on ethnobotany, plant diversity and ecology hosted by Herbarium Club at Cadi Ayyad University for students, researchers and other stakeholders in yr 3 Paper on change in medicinal root harvesting and plant diversity under different governance scenarios submitted for peer review by yr 3	Analysed data sets and draft reports of ecological and floristic surveys Conference proceedings Draft manuscript for review Photo essay of community-based botanical research	Students available to assist in scientific research and are diligent in finishing projects in a timely manner Agreements reached with local and national authorities on community nurseries and research protocols Staff turnover manageable and project partners maintain participation for three years Free, prior and informed consent given by community for all development and research activities
Activity 1.1 Baseline studies of medicinal roots produced			
Activity 1.2 Initial plant diversity surveys completed			
Activity 1.3 Final ecological and floristic surveys conducted			
Activity 1.4 Conference organized			
Activity 1.5 Peer review paper submitted			

(2) Participatory planning conducted in two townships, generating socio-economic and environmental data to assist community decision-making throughout the project cycle and delivering a comprehensive assessment of livelihood impacts by project end	Compilation of existing socio-economic and environmental assessments by middle of yr 1 Baseline surveys conducted by end of yr 1 used to update existing data and explore trends Community evaluation of participatory planning conducted by middle of yr 2 reviewed by steering committee Working paper on change over time in socio-economic and environmental parameters submitted to Department of Environment and High Commission on Water and Forest by yr 3	Compiled assessments, surveys and evaluations; Draft working paper	Free, prior and informed consent given by community for all development and research activities Agreements reached with local and national authorities on community nurseries and research protocols
Activity 2.1 Socio-economic and environmental assessments compiled			
Activity 2.2 Baseline surveys conducted			
Activity 2.3 Community evaluation conducted			
Activity 2.4 Working paper submitted			
(3) Two community plant nurseries established, leading to production of 40,000 individual seedlings and saplings, and their distribution to 1000 households engaged in terrace cultivation and enrichment planting.	Two nurseries, with 180 m^2 greenhouses, fencing and irrigation installed by yr 1 Production and distribution of a total of 20,000 plants per rural township by yr 3 Overview of periodic supervisory field visits submitted at end of yr 1, 2 and 3; reviewed by steering committee Community exchanges organised among key participants from target rural townships and from the MAP Programme site in the Middle Atlas Income derived from medicinal root trade increased 50% to £450/yr for 200 collector HH; income for 800 HH increased on average by £125/yr (10%-20%) from cultivation and processing of	Photo essay of nursery construction Project notes from supervisory visits Survey data of seedling and sapling survival rates Economic data on HH income improvement Video of community exchanges	Agreements reached with local and national authorities on community nurseries and research protocols Free, prior and informed consent given by community for all development and research activities Agroforestry products (fruits, nuts) and roots (medicinal and orris) continue to be easily marketed and maintain monetary value throughout project

	fruits, nuts and orris roots by yr 3 Summary analysis of survival rate of seedlings and saplings compiled by end yr 3		
Activity 3.1 Nurseries established			
Activity 3.2 Seedlings and saplings produced and distributed			
Activity 3.3 Periodic supervisory field visits made			
Activity 3.4 Community exchanges organised			
Activity 3.5 HH income surveys completed			
Activity 3.6 Plant survival rate assessed			
(4) Policy guidelines developed based on international expertise and practical case studies to advise government agencies and other stakeholders responsible for implementation of the GSCP, NBSAP, National Strategy on MAPs and other instruments related to the environment and sustainable development.	Three stakeholder workshops conducted by end of yr 2 Project results disseminated in four international academic and policy venues by end of yr 3 Steering committee established by month 3 leading to formulation of a broader working group on plant conservation Case studies and expert opinions submitted to the Department of Environment, High Commission for Water and Forest and Institut scientifique for inclusion in revised NBSAP, MAP National Strategy and reviews of Important Plants Areas study and GSPC implementation in Morocco by yr 3	Case study working drafts Expert opinion submissions Final modified versions of government policy instruments External evaluations	Staff turnover manageable and project partners maintain participation for three years
Activity 4.1 Workshops conducted			
Activity 4.2 Presentations made			
Activity 4.3 Steering committee and working group established			
Activity 4.4 Case studies and expert opinions submitted			
Activity 4.5 External midterm and final evaluation			

Annex 3 Standard Measures

Table 1 Project Standard Output Measures

Code No.	Description	Gender of people (if relevant)	Nationality of people (if relevant)	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	Total to date	Number planned for reporting period	Total planned during the project
4A 4B 4C 4D	Undergraduate and postgraduate students from Cadi Ayyad University in Marrakech and University of Reading carried out training on herbarium techniques, plant identification and conservation assessments. 5 weeks total training.	9 women, 11 men	Moroccan and 1 Spanish woman	15	20	0	0	35	15	30
5	6 community researchers, 4 of whom have undergraduate degrees, 4 months in year 1	2 women, 4 men regular, + 1 woman for socioeconomic surveys		4	4	4	0	8	4	12
8	Gary Martin and Emily Caruso time on project work in Morocco (weeks)	1 man, 1 woman		10	15	15	0	25	15	40
9	Conservation assessments for 10 species of endangered plants in Morocco			10	0	1	0	10	10	11
10	Reports of ecological and floristic surveys			0	0	2	0	0	0	2
11A 11B	Papers to be published in peer reviewed journals Papers submitted for peer review			0 0	1 1	2 0	0 2	1 0	1 0	3 2
12B	Database of redlisted species enhanced and			0	0	1	0	0	0	1

	made available in Morocco MARK herbarium database enhanced Imegdale flora, Ait M'hamed flora and Endemic flora database established, using BRAHMS			0 0	1 0	0 1	0 0	1 0	1 0	1 1
13A 13B	Community herbaria established in Imegdale and Ait Mhamed and collections enhanced at Cadi Ayyad and Institut Scientifique herbaria			0	4	0	0	0	0	4
14A 14B	Stakeholder workshops organised near Marrakech			1	1	1	0	2	1	3
15A	1 national press release on the creation of the Moroccan Plant Specialist Group			1	0	1	0	1	0	2
16A 16B 16C	GDF newsletter circulated to 2500 recipients internationally			1	0	1	1	1	0	3
17A	Dissemination network as a result of the kick-off workshop – the Moroccan Plant and Livelihoods Specialist Group dissemination network			1	0	0	0	1	0	1
20	2x water pumps, 2x greenhouse materials, 2x wells and water basins, 2x production materials for plants Plant collecting monitoring			£24,000 £3,500	0 £3,500	0 £3,500	0 0	£48,000 £7,000	£24,000 £3,500	£24,000 £10,50

	supplies									0
21	NGO to be established			0	1	0	0	1	0	1
23	CEPF large grant									

In Table 2, provide full details of all publications and material produced over the last year that can be publicly accessed, e.g. title, name of publisher, contact details, cost. Mark (*) all publications and other material that you have included with this report.

Table 2

Publications

Title	Type (e.g. journals, manual, CDs)	Detail (authors, year)	Gender of Lead Author	Nationality of Lead Author	Publishers (name, city)	Available from (e.g.website link or publisher)
Conservation assessments and Red Listing of the endemic Moroccan flora (monocotyledons)	Journal	Hassan Rankou, Alastair Culham, Mohammed Sghir Taleb, Ahmed Ouhammou, Gary Martin, Stephen L. Jury	Male	Moroccan	Botanical Journal of the Linnaean Society	http://onlinelibrary.wiley.com/doi/10.1111/boj.12258/abstract

Checklist for submission

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