ROYAL BOTANIC GARDEN EDINBURGH

DARWIN INITIATIVE

Institutional Capacity Building and Training, Royal Botanic Garden Serbithang, Bhutan
August 2003 – April 2006
FINAL REPORT

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REPORT BY DR DAVID RAE AND DR UGYEN TSHEWANG

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Front page photograph: Dochu La

1. Darwin Project Information

Project Ref. Number	162 / 12 / 024
Project Title	Institutional Capacity Building and Training, Royal Botanic Garden, Serbithang
Country(ies)	Bhutan
UK Contractor	Royal Botanic Garden Edinburgh
Partner Organisation(s)	Royal Botanic Garden Serbithang
Darwin Grant Value	£124,635.00
Start/End dates	1 August 2003 – 31 March 2006
Project website	N/A
Author(s), date	Dr David Rae and Dr Ugyen Tshewang

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Education workshop participants

2. Project Background/Rationale

Introduction

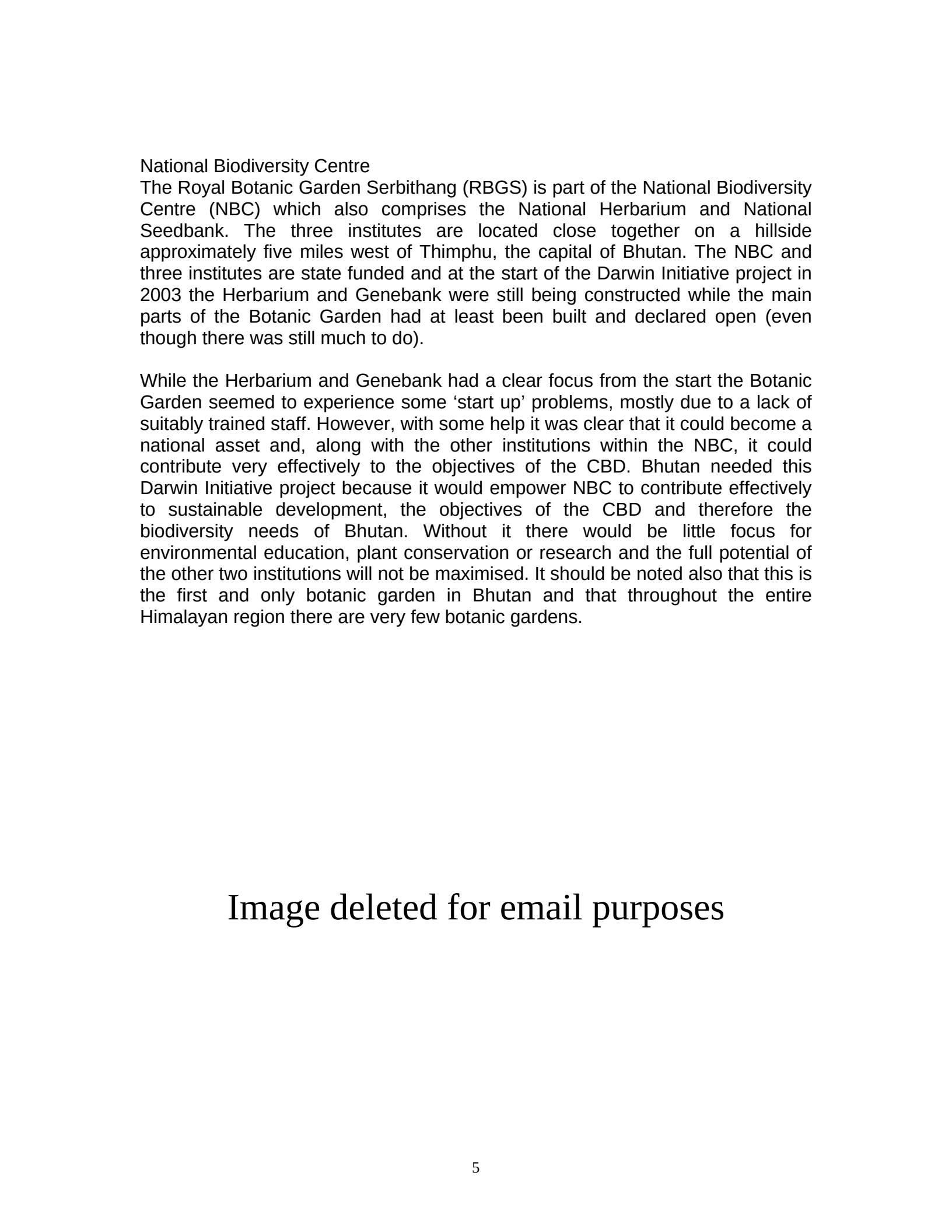
Bhutan is a small landlocked country about the size of Scotland but it has an exceptional biodiversity, including more than 5,600 species of vascular plant. The diverse range of altitudes, and consequently of climates, relatively low population density and the widespread continuation of traditional lifestyles has resulted in a large variety of natural and seminatural habitats. More than 75% of Bhutan remains forested as a result of the low population and enlightened environmental policies. However, as in many parts of the developing world, there are also significant threats facing parts of the country. It is significant to note, for instance, that while Bhutan has a very well developed protected area network it has also (almost) halved infant mortality and while life expectancy has increased enormously in the last 30 years. These two statistics alone (while being a magnificent achievement) will store up problems in terms of population density and the consequential issue of land and resource allocation in the future. The Government of Bhutan is acutely aware of these issues and the urgent need to conserve its exceptional biodiversity and natural resources and as a result has recently established a National Biodiversity Centre (NBC).

Example of interpretation panel

National Biodiversity Centre

The Royal Botanic Garden Serbithang (RBGS) is part of the National Biodiversity Centre (NBC) which also comprises the National Herbarium and National Seedbank. The three institutes are located close together on a hillside approximately five miles west of Thimphu, the capital of Bhutan. The NBC and three institutes are state funded and at the start of the Darwin Initiative project in 2003 the Herbarium and Genebank were still being constructed while the main parts of the Botanic Garden had at least been built and declared open (even though there was still much to do).

While the Herbarium and Genebank had a clear focus from the start the Botanic Garden seemed to experience some ‘start up’ problems, mostly due to a lack of suitably trained staff. However, with some help it was clear that it could become a national asset and, along with the other institutions within the NBC, it could contribute very effectively to the objectives of the CBD. Bhutan needed this Darwin Initiative project because it would empower NBC to contribute effectively to sustainable development, the objectives of the CBD and therefore the biodiversity needs of Bhutan. Without it there would be little focus for environmental education, plant conservation or research and the full potential of the other two institutions will not be maximised. It should be noted also that this is the first and only botanic garden in Bhutan and that throughout the entire Himalayan region there are very few botanic gardens.



Inauguration plaque

Project background

Lympo Dr Kinzang Dorji, Bhutan's Minister of Agriculture, visited the Royal Botanic Garden Edinburgh (RBGE) in January 2002 to officially commemorate the completion of the *Flora of Bhutan* project (a 7 volume account of Bhutan's plants published by RBGE and completed over a 25 year period). During those celebrations he asked if it would be possible for Edinburgh to help the recently created RBGS as it seemed to be experiencing some difficulties and lacked suitably trained staff. While the Garden had been established three years earlier to celebrate the King's Golden Jubilee there was disappointment in Royal and Government circles that it was not developing as well as had been hoped. Following Dr Dorji's visit to Edinburgh Dr Rae secured funding from the British Council in Calcutta to visit RBG Serbithang and in June 2002 was able to meet with NBC Director, Dr Ugyen Tshewang to assess the site, consider its potential and review the possibility of RBGE becoming involved. As a result he wrote a report highlighting what might be achieved in the short term. While the site had limitations in terms of poor soil and wind exposure it was, however, also conveniently located close to the NBC, Herbarium and Genebank. The biggest limitation though was a critical lack of horticulturally trained staff and knowledge of botanic garden management. This was nobody's fault- those skills simply did not exist in Bhutan.

Need for the project

Bhutan is rich in Biodiversity but poor in resources and therefore fits the criteria for a Darwin Initiative grant very well. Bhutan is cited as having one of the smallest and least developed economies in the world with GDP per capita of just £1200. Its plantlife however, includes more than 5,600 species of flowering plant alone which, combined with its 75% intact forest cover, means that it is a massively important centre for biodiversity within the northern India/Himalaya area.

3. Project Summary

The ultimate purpose of the project was to raise standards in the RBG Serbithang so that it could realise its full potential and could contribute to sustainable development and the objectives of the Convention on Biological Diversity (CBD), particularly to environmental education, conservation and research. Before it could do that a number of fundamental activities needed to take place that could best be described as institutional capacity building and training. They were as follows: 1. To enable staff to propagate and cultivate plants. This would be achieved by helping to develop a nursery, arranging staff exchanges and holding propagation workshops. 2. To give the staff an understanding of collection curation through plant records, collections policies

and collections management. 3. To help develop the interpretative potential of the Garden, including plant labelling, a map/leaflet and interpretative information. 4. To equip staff with the ability to use the Garden and its resources for educational activities, for school teachers, school children, students and the public in general, including tourists.

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Example of interpretation panel

The project was designed to assist Bhutan in achieving a number of CBD articles. In the short term the most obvious ones were Article 9 (*ex situ* conservation) because the Botanic Garden would be growing its native flora and Article 13 (public education and awareness) because the Garden would be showcasing and explaining the value of its plants. However, if that was the sum total of activities aimed at the CBD then it would valuable, but not that significant.

We believed though, and so did the staff at the NBC and at the Botanic Garden in Serbithang, that once the Garden and its staff could raise their standards in training, education, record keeping, infrastructure and quality of maintenance then they could contribute very effectively to a lot more Articles. In the medium term the Garden could certainly contribute to Articles 8 (*in situ* conservation), 12 (research and training), 16 (access to, and transfer of, technology), 17 (exchange of information) and 18 (technical and scientific cooperation).

It is worth noting too that the Garden could contribute directly to a number of Targets within the Global Strategy for Plant Conservation which has been derived directly from the CBD. Examples include Targets 1-3 in the section ' Understanding & documenting plant diversity', 7 & 8 in 'Conserving plant diversity', 14 in 'Promoting education & awareness' & 15 &16 in 'Capacity Building.'

Project activities

The whole three year project was broken down into a number of ‘elements’ each of which had a purpose, brief (for staff to follow), budget and outcome(s). The logical framework, which did not need to be changed during the project, is shown in Appendix I along with notes against the outcomes.

The following short paragraphs describe each element of each year in the chronological order in which they took place.

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Selecting timber for interpretation panels

Year 1
In July/August Dr Ugyen Tshewang, Director of the National Biodiversity Centre, visited RBG Edinburgh to finalise the logistics and aims of the project, view the facilities at RBGE and meet with key staff to discuss the management of botanic gardens. Dr Tshewang met with management, conservation, education and curatorial staff.

In August 2003 Dr David Rae, the project leader visited RBG Serbithang to finalise arrangements for all the stages due to take place in the period from the start of the project (August) until the end of the reporting year. This involved meetings with the Director of the NBC and Curator of the Garden to ensure that everything would work well, that everybody understood what would happen and how and that the necessary logistical aspects such as travel, visas and accommodation were in place. Initial discussions about the proposed nursery area also took place.

In Oct/Nov Tony Garn (Supervisor at RBG Edinburgh) and Brian Cunningham (Horticulturist in RBGE's Rock Garden) spent 3 weeks at RBG Serbithang. The purpose of the visit was threefold- to give practical training workshops, to improve the maintenance of the Garden and to work side by side with staff on specific Garden development projects. Notes to accompany the training workshops were included as an appendix in the year 1 report and a further report on the state of the Garden, along with improvement recommendations, written by Tony Garn and Brian Cunningham were included as a further appendix in that report.

In Nov/Dec Peter Brownless (Propagation Supervisor at RBGE) visited Bhutan for two weeks to lead propagation workshops and plan, in detail, the proposed nursery. Initially, two staff were to go together but, at the request of Dema Sangay (Curator at RBG Serbithang), Peter went by himself at this stage and then it was planned that he would go again in March to supervise the building of the nursery. This would still amount to two people visiting within the year in question and seemed like a good idea. In reality three factors combined to delay the building of the nursery and so Peter's return visit had to be delayed until early in the second year of the project. This was agreed with Darwin staff and Peter's return visit took place in June 2004. The three factors that held up nursery construction were- delays by the contractors in producing the plans, delays by Bhutanese Government planners in approving the plans and delays by Bhutan's Finance Ministry in signing an MOU which was necessary before the money for the construction (£8,000) could be transferred. Finally, had it been possible to start the project on 1 April 2003 as originally planned it would have been possible to completed this element within the financial year. It was agreed to start the project in August to help the Darwin Initiative management and this made it

difficult to complete this part of the project by 31 March 2004. However, all the plans were eventually sorted out satisfactorily and the construction eventually took place later in 2004.

Peter's visit was very successful and he gave numerous workshops and practical demonstrations on all aspects of propagation. Notes to accompany the workshops were included as an appendix in the Year 1 report. Plans for the nursery were also fully developed and agreed during the visit.

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Constructing interpretation panels

In February/March 2004 Sangay Khandu and Kinzang Tshering visited RBG Edinburgh to undergo practical on-the-job training. They spent their time split between Edinburgh and one of Edinburgh's Regional Garden's, Benmore Botanic Garden which has a special interest in Himalayan and Bhutanese plants. During their visit they spent time with each of the Garden's Departments and received training in numerous aspects of botanic garden horticulture.

Year 2

All the work that should have taken place during the year did take place and is summarised below. Some timings changed slightly from the timetable given in the original document but these were only to take account of some difficulties in travel schedules and to take account of other staff commitments. Also, Sangay Dema was unable to come to Edinburgh to take part in the training programme as described in the timetable as she was pregnant but her place was taken by another, newly appointed, member of staff - Sonam Tobgay (who has been appointed to the new post of Supervisor). Apart from those two minor details everything was accomplished as agreed.

In June David Rae visited the Garden to check on progress since the last visit and finalise arrangements for the coming year. During that time he was able to spend a lot of time with Dr Ugyen Tshewang, Director of NBC discussing the timings and outputs of the project and also the long term plans for the Garden. He also spent time with Sangay Dema, Garden Curator, discussing botanic garden management issues. During this time he also wrote a collections policy (which was included in the Year 2 report) jointly with Sangay and did some practical work.

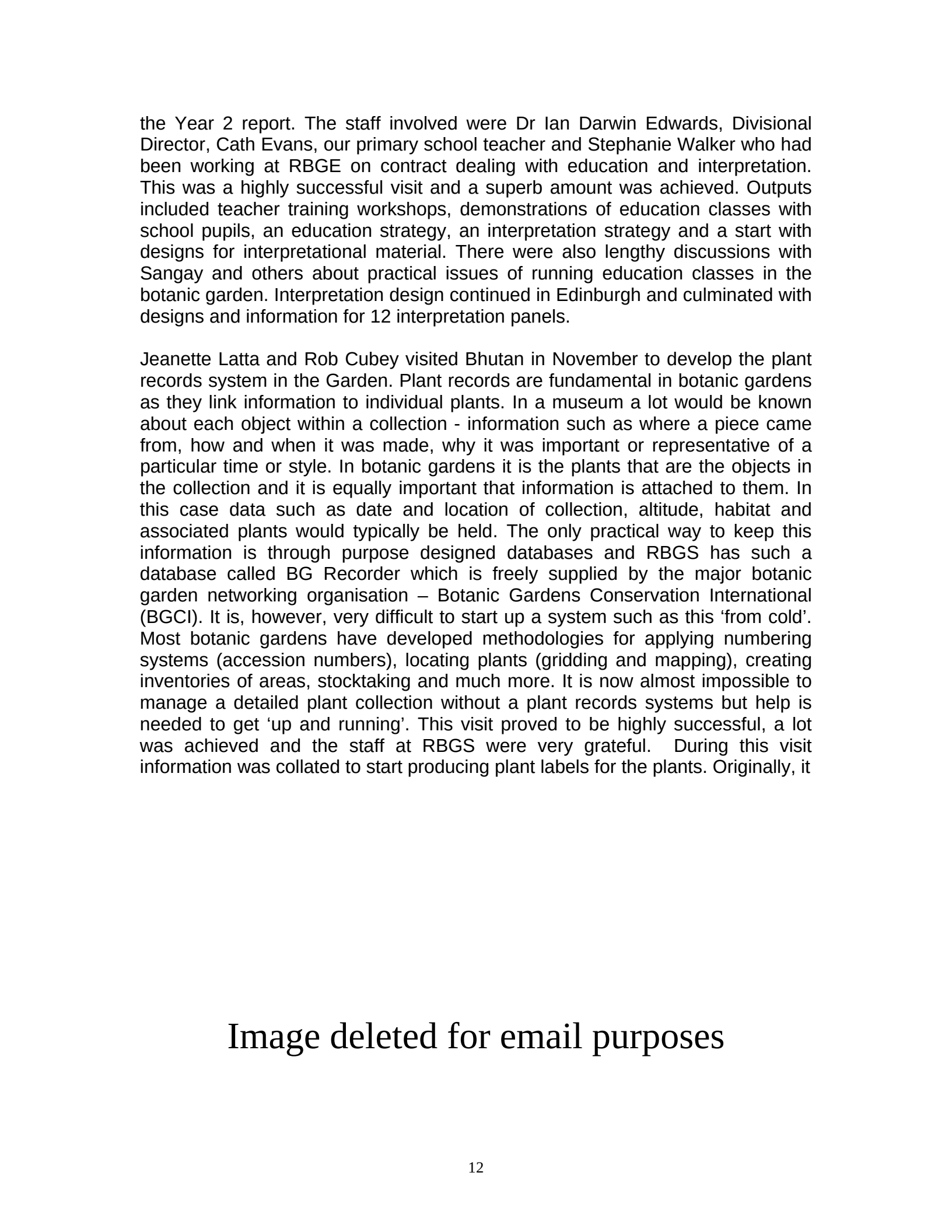
In May Peter Baxter, Curator of Benmore Botanic Garden (one of RBGE's Regional Gardens) and Clare Morter, a member of horticultural staff from Edinburgh visited RBGS for a three and four week period (respectively) to lead practical workshops and undertake practical project work Their report and recommendations were included as an appendix in the year 2 report. Their visit was highly successful and a lot was achieved. Much of the work focussed on tree establishment and maintenance but Peter and Clare also spent a lot of time with Sangay Dema discussing and giving advice on a whole range of issues and areas of concern. During the last week in particular, when Peter had returned to Scotland Clare was able to spend a considerable amount of time, especially with two of the women staff, developing their knowledge and interest and this was particularly valuable. Interestingly, this visit led on to a request for Peter Baxter to visit again (funded by the Bhutanese) with a landscape architect from Edinburgh to give advice and outline guidance on a proposed national park.

In July Peter Brownless (who had visited previously) and Ross Irvine, a senior horticulturist, visited RBGS to help organise and establish the nursery that had been delayed from the previous year. Ross' visit was paid by RBGE as a contribution to the project and to help his own training and development potential. Peter and Ross led numerous propagation workshops and helped oversee nursery developments. They also gave a lot of advice and did a lot of general maintenance work. It was an excellent visit and a full account of their work appeared in an appendix of the Year 2 report.

Three staff from Edinburgh's Public Programmes Division visited in July. Their Education Report and interpretation Master Plan were included as appendices in

the Year 2 report. The staff involved were Dr Ian Darwin Edwards, Divisional Director, Cath Evans, our primary school teacher and Stephanie Walker who had been working at RBGE on contract dealing with education and interpretation. This was a highly successful visit and a superb amount was achieved. Outputs included teacher training workshops, demonstrations of education classes with school pupils, an education strategy, an interpretation strategy and a start with designs for interpretational material. There were also lengthy discussions with Sangay and others about practical issues of running education classes in the botanic garden. Interpretation design continued in Edinburgh and culminated with designs and information for 12 interpretation panels.

Jeanette Latta and Rob Cubey visited Bhutan in November to develop the plant records system in the Garden. Plant records are fundamental in botanic gardens as they link information to individual plants. In a museum a lot would be known about each object within a collection - information such as where a piece came from, how and when it was made, why it was important or representative of a particular time or style. In botanic gardens it is the plants that are the objects in the collection and it is equally important that information is attached to them. In this case data such as date and location of collection, altitude, habitat and associated plants would typically be held. The only practical way to keep this information is through purpose designed databases and RBGS has such a database called BG Recorder which is freely supplied by the major botanic garden networking organisation – Botanic Gardens Conservation International (BGCI). It is, however, very difficult to start up a system such as this ‘from cold’. Most botanic gardens have developed methodologies for applying numbering systems (accession numbers), locating plants (gridding and mapping), creating inventories of areas, stocktaking and much more. It is now almost impossible to manage a detailed plant collection without a plant records systems but help is needed to get ‘up and running’. This visit proved to be highly successful, a lot was achieved and the staff at RBGS were very grateful. During this visit information was collated to start producing plant labels for the plants. Originally, it



had been suggested that we might use local craftsmen to hand paint these labels in traditional style. However, at the request of staff at RBGS we decided to use traditional engraved white on black botanic garden labels. The reason was two-fold: firstly it would make RBGS 'look like a botanic garden' and second, they are more standardised and quick to produce. Virtually all the plants in the garden were labelled with temporary labels and the engraved labels followed in batches.

In January three staff from RBGS arrived in Edinburgh for horticultural training. Sonam Tobgay and Tshring Wangmo were funded by the Darwin Initiative project and stayed for 4 weeks and Wangmo Moitra was funded by a bursary from the Royal Horticultural Society and stayed for 8 weeks. During their stay at Edinburgh it was a pleasure to see that they made the very best of their time and it was also very pleasing to note that staff at Edinburgh made an enormous effort to look after them and make sure that they had a valuable time from both a training perspective and also culturally and socially. During their time they gained a lot of very valuable practical experience in all departments of the Horticulture Division and also in the Public Programmes Division where they learnt about education and interpretation. They were also given the opportunity to travel to and work in our regional gardens. Again, this was a most worthwhile and valuable visit.

Year 3

In May Neil McCheyne, Supervisor at Benmore Botanic Garden and Barbara Gordon, horticulturist at Logan Botanic Garden visited RBGS for a three week period of practical training and project work. During their time they were able to build on, and consolidate, the practical work undertake by the previous horticulturists. In particular, they held practical demonstrations of horticultural techniques and helped with project work and garden maintenance. Their visit was particularly successful and much was accomplished.

In November Dr Ian Darwin Edwards visited RBGS for the second time. During the first visit he had lead a group of education staff who had organised education and interpretation workshops and training sessions. At the end of this visit an education strategy and interpretation strategy were produced which were appended to the year 2 report. In the time between the two visits Ian had worked

with designers and interpretation staff to develop twelve interpretation panels and during this second visit he was able to supervise the selection of exact locations and then the construction of the woodwork necessary to hold the panels and, finally, the erection of these panels. He was also able to start gathering material for the publication of the visitors guide to the Garden which was produced after he had returned back to Scotland. During the first part of his visit he was able to take part in a formal dedication of the Garden presided over by the Prime Minister, several other Ministers and government officials and also by monks. During this time he had a lengthy audience with the Prime Minister and was able to discuss the aims of this Darwin Project, general issues about conservation and sustainability and also the aims and objectives of the Darwin Initiative in general.

Towards the end of Dr Edwards' visit David Rae travelled to Bhutan accompanied by professor Mary Gibby, Director of Science at RBGE and also by Sally Mackay, Curator of the Bryophyte (moss and lichen) herbarium at Edinburgh. The purpose of David's visit was to review the work that had taken place since the last visit, ensure that the final stages of the project would be finished off satisfactorily and discuss proposals for continuing the collaboration between the two gardens after the Darwin Project had come to an end. Professor Gibby and Sally Mackay did not travel on Darwin money but from funds found from within RBGE. Prof Gibby was keen to explore the possibility of collaborating with herbarium staff to produce a check list of Bhutanese ferns (as these were not covered in the *Flora*) and Sally Mackay had offered to help curate the bryophytes in the herbarium. To date, since the opening of the Herbarium, all the flowering plants, ferns and conifers had been properly mounted and put away in their correct place in the Herbarium, but the bryophytes had been left as these required different procedures. Sally has been curating the bryophytes at Edinburgh for over 20 years and was able to train the staff in the appropriate techniques and then helped to work through he material they had, sorting it out, putting the material into the correct covers and then laying them away in the Herbarium. This was a very satisfying and helpful visit as a lot of 'add on' work was achieved as well as the Darwin work. It was also a useful opportunity to have several colleagues from Edinburgh in Bhutan together and be able to discuss ideas and options for continuation of collaboration after the Darwin Project.

In November Ngawang Gyeltshen and Tshering Dupka, from RBGS visited RBGE for a period of practical work experience and focussed training sessions. During their stay they worked in, and gained experience of, propagation, nursery work and collection maintenance. We were also able to discuss the work and role of botanic gardens and covered conservation issues, research in botanic gardens and standards of record keeping. Their visit was, we think, successful and worthwhile.

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Hard landscape construction

At the start of the third year of the project Sangay Dema, Curator of the Garden, was given the opportunity by the Government of Bhutan to undertake the MSc in Taxonomy at Missouri Botanic Garden. While this would take her away from the day to day running of the Garden for two years it also presented her, and the garden, with a wonderful opportunity to undergo extra training and also to visit one of the foremost botanic gardens in the world. It did mean that David Rae lost his immediate project contact but that vacancy was ably covered by Dr Tshewang and other Garden staff such as Sonam Wangdi and Ngawang Gyeltshen. Sangay was supposed to come to Edinburgh for two weeks during the final year to undertake some specialist botanic garden management training but since she was now in one of the world's best botanic gardens (Missouri) and had already visited Edinburgh before it seemed like an even better idea that she undertook the visits and training in the USA instead. Sangay was able to arrange an excellent programme, spread over several months, to visit and speak to staff in several botanic gardens in central north USA. These included Missouri, Chicago Botanic Garden, the Morton Arboretum, the Holden Arboretum and, finally, New York Botanic Garden. At these Gardens she was able to meet with staff to discuss management and policy issues including conservation

collections, standards of information and databasing, collection policies and their implementation, environmental policies, issues of sustainablilty in botanic gardens and much more. It really was an excellent opportunity and I think we were able to derive the very best outcome from the fact that Sangay was away and unable to visit the UK (because her visa only allowed her to visit the USA).

Finally, to complete all the elements of the Project Dr Ian Darwin Edwards was able to complete the map/leaflet that will be used to both publicise the Garden and inform visitors. The idea is that it should be distributed to hotels and other visitor attractions in Bhutan as well as being used in the actual Garden.

The account above summarises the actual work of the project and what was achieved. None of the original objectives were altered and all of the outcomes were met. No significant changes were made. The only minor modifications were that nursery construction was completed in Year 2 instead of Year 1 due to reasons explained above (and also in the Year 1 and 2 reports) and that Sangay Dema did her 'management visit' in the USA instead of the UK (as explained above).

The whole project was designed to meet the objectives of the CBD. After all, the Darwin Initiative is designed to help countries meet the CBD. We said at the start that botanic gardens have an important role to play in delivering CBD objectives for plant conservation if they are modern, functional and have well trained and motivated staff. RBGS is still very young and the idea behind the project was to help it on the path to getting established as a modern, functional botanic garden. This project was to be a start, to help them get moving in the right direction. We believe we have achieved this but there is, of course, still a long way to go. An incredible amount has been achieved in three years and more will be achieved in the future. Appendix III shows the Articles under the CBD which best describe the project.

We believe that the project has been very successful and that all of the objectives, and more, have been achieved. We also believe that significant additional accomplishments have been achieved such as finding funds to bring additional staff over from Bhutan to Edinburgh for training and also finding additional funds to get more staff over from Edinburgh to Bhutan. It was pleasing that extra herbarium curation could take place and it was also highly significant that Professor Gibby, RBGE's Director of Science could visit as she is now enthusiastic about Bhutan and keen to further our collaboration. As a direct consequence of the project we have been able to find funds from the UK to sponsor Wangmo Moitra to attend the World Botanic Garden Education conference in Oxford this autumn and then enrol in the Botanic Garden Education Course due to be held at RBG Kew immediately afterwards. These events will take place after the Darwin Project has finished and therefore show that collaboration is continuing after the Darwin Project.

4. Scientific, Training and Technical Assessment

There was no scientific or research component of the project but training and capacity building were at the heart of the entire programme. The summary above has listed all the elements and given a short account of the nature of the training and capacity building. The programmes were not classroom-based highly structured training programmes with assessments and accreditation but were far more based on demonstrations, practical sessions and shoulder to shoulder work.

Selection criteria were based on the capacity of the staff to benefit from the programmes and give lasting benefit on their return. Also, as there are very few staff there were few to choose from and virtually everybody that could have been involved, was involved. Staff selected to come to RBGE were chosen jointly by David Rae and Dr Ugyen Tshewang. In total eight staff from RBGS came to RBGE. When RBGE staff went to RBGS to give practical training as many staff as possible were involved.

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Marking out nursery area

Training and capacity building topics included: horticulture, propagation, nursery work, landscape construction and maintenance, labelling, databasing (of collections), education, interpretation and collection policies. Content of these has appeared in previous Annual Reports and are too lengthy (and repetitive) to include here.

5. Project Impacts

We made it clear in the application that the main purpose of the project was for RBGS to help Bhutan fulfil its obligations to the CBD. However, before this could ever happen it needed to build its capacity, knowledge base and general 'know how'. The Darwin Project was to be a means to an end with the end being an ability to contribute to the CBD but RBGS needed to be able to function as a modern botanic garden first and this was the purpose of the Darwin Project and determined the way in which the project was structured. The 'Measurable Indicators' in the Logical Framework are all based on this fact of getting RBGS up and running as a modern botanic garden.

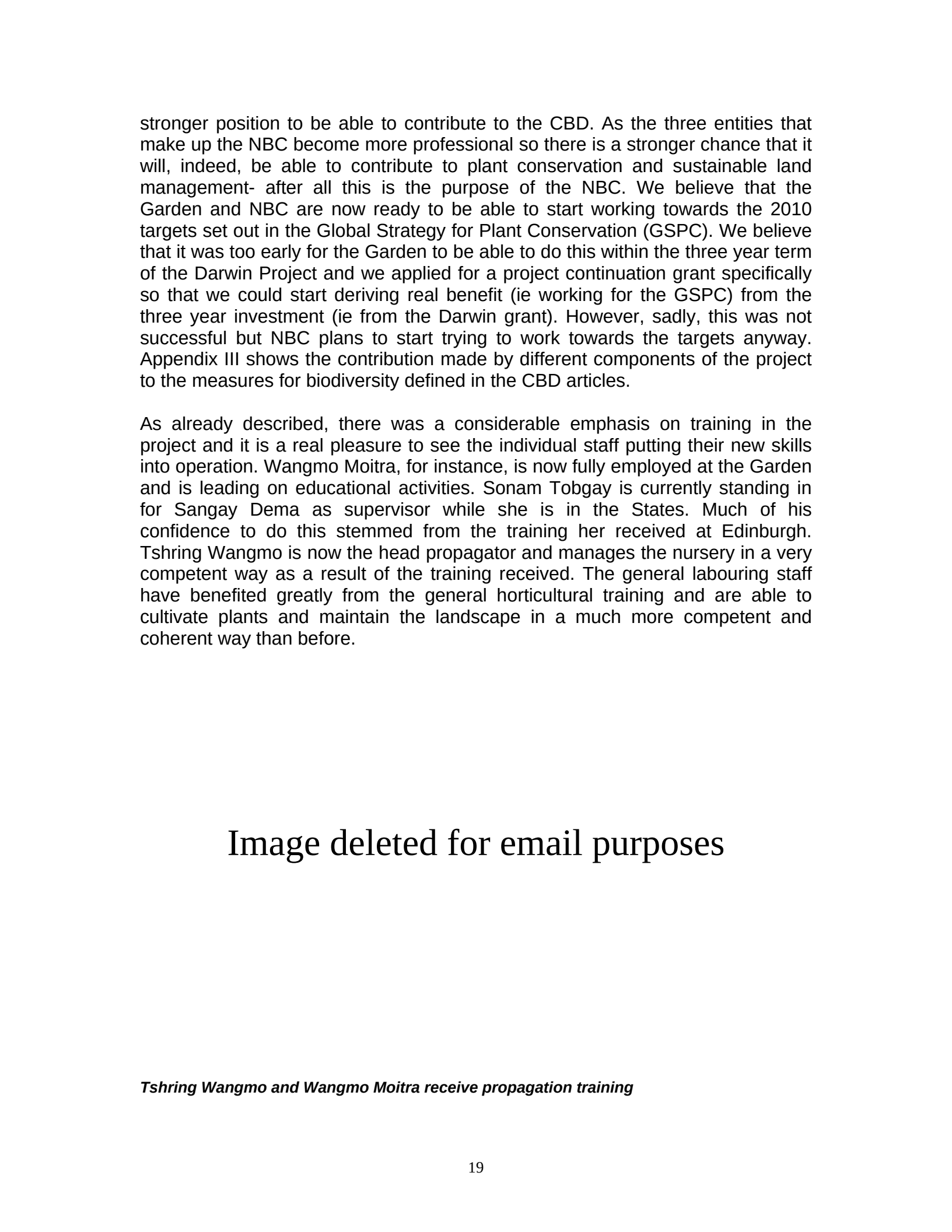
There is considerable evidence that project achievements have led to the accomplishment of the project purpose. The Garden is visually greatly improved and trees and shrubs are now thriving. New areas have been landscaped and staff have been trained in maintenance and cultivation. Material is being successfully propagated in the newly installed nursery and labels are appearing on plants. Staff have been trained in plant records systems but we believe that there is still a little way to go before this aspect of the Garden's work is fully up to speed. Interpretation boards have appeared explaining aspects of both the Garden and of Bhutan's important biodiversity. School children visit the garden frequently and are instructed in imaginative ways using the resources of the Garden. The production of a garden map/leaflet at the end of the project will help advertise the garden to visitors and local citizens alike and will help to boost visitor number and therefore the number of people who read the interpretation boards and thereafter have a better appreciation of Bhutan's important biodiversity.

Additional benefits have led to other (over and above the Darwin project) staff from Edinburgh visiting NBC and contributing to the work Garden and of the Herbarium. Also, following on from the contact and stimulation received in the Darwin Project Sangay Dema has been inspired to further her training and has enrolled on the MSc at Missouri Botanical Garden. While it is unfortunate that she has had to leave the Garden for two years the long term effect will be considerable.

All these elements have moved RBGS on considerably and, now that the Herbarium and Genebank have been completed we believe that NBC in a

stronger position to be able to contribute to the CBD. As the three entities that make up the NBC become more professional so there is a stronger chance that it will, indeed, be able to contribute to plant conservation and sustainable land management- after all this is the purpose of the NBC. We believe that the Garden and NBC are now ready to be able to start working towards the 2010 targets set out in the Global Strategy for Plant Conservation (GSPC). We believe that it was too early for the Garden to be able to do this within the three year term of the Darwin Project and we applied for a project continuation grant specifically so that we could start deriving real benefit (ie working for the GSPC) from the three year investment (ie from the Darwin grant). However, sadly, this was not successful but NBC plans to start trying to work towards the targets anyway. Appendix III shows the contribution made by different components of the project to the measures for biodiversity defined in the CBD articles.

As already described, there was a considerable emphasis on training in the project and it is a real pleasure to see the individual staff putting their new skills into operation. Wangmo Moitra, for instance, is now fully employed at the Garden and is leading on educational activities. Sonam Tobgay is currently standing in for Sangay Dema as supervisor while she is in the States. Much of his confidence to do this stemmed from the training her received at Edinburgh. Tshring Wangmo is now the head propagator and manages the nursery in a very competent way as a result of the training received. The general labouring staff have benefited greatly from the general horticultural training and are able to cultivate plants and maintain the landscape in a much more competent and coherent way than before.



Tshring Wangmo and Wangmo Moitra receive propagation training

Collaboration with the RBGE has, we believe, been good. RBGS staff visiting Edinburgh have, we hope, been well looked after. They have had well organised training programmes with a mixture of training. We have also made sure that the cultural side of things has not been neglected and staff have visited castles and other historic places as well as attending dances and parties. Likewise, in Bhutan we have been extremely well looked after and have had the opportunity to have days out to look at the local vegetation and visit places of interest. As a result there is a strong bond between the two institutions that will last well beyond the Darwin project. While in Bhutan RBGE staff have had the opportunity to visit Ministers and government officials and these have been invaluable meetings to make sure that know of the Darwin work and to ensure that they know of the valuable work being done by the Garden at Sebithang. Opportunities have also been taken to visit the University in Serbithang as a result of the Vice Chancellor visiting RBGE while he was on an official visit to Edinburgh. We believe then that the project has been a benefit on a whole range of levels from personal and social where individuals have gained from training and also from opportunities to travel and see other parts of the world and learn of different cultures, to community and institutional benefits. It is not always possible to measure these but one can simply see the benefit by looking at the garden, seeing the visitors and observing staff from two different cultures and places getting on well together while learning new skills and techniques.

Tshring Wangmo inserting cuttings into the new greenhouse

It is very pleasing to note that the project has led to two notable additional projects. As a direct result of Peter Baxter's visit in Year 2 Edinburgh was asked to help prepare a feasibility report for the creation of a national park. The area under consideration had been slightly modified by a Japanese project to produce mushrooms which had failed so the area could not be described as pristine. However, it is quite close to the capital Thimphu and is very attractive and species rich. We engaged the help of a landscape architect from Edinburgh and together he and Peter Baxter visited the area (called the Dochu La) and wrote their feasibility report. The report was well received and the area is now designated a 'Botanical Park' This was felt to be a good hybrid name between botanic garden and national park as it was not quite either! The site now exists and a visitor orientation building with information about Bhutan 's biodiversity and suggested walking routes is currently being constructed.

As a result of RBGE's knowledge of Bhutan the Edinburgh Centre for Tropical Forestry (ECTF) invited the Garden and others to combine in a European Union-funded project involving the development, cultivation and production of traditional medicinal plants in Bhutan. While RBGE is only a very minor partner it is pleasing to know that we were helpful in gaining the project for ECTF as a direct involvement of our experience in Bhutan, including the Darwin Project.

6. Projects Outputs

Project outputs are shown in the Logical Framework in Appendix I. All agreed outputs were achieved and some exceeded the quantities shown in the original application form. Virtually all were accomplished within the year intended except for completion of the nursery which was held up for planning reasons and was completed in Year 2 instead of Year 1. The Darwin Secretariat was notified of this at the time and it was agreed that it was acceptable to complete it in Year 2. It was particularly pleasing to be able to prepare the feasibility plan for the Botanical Park, described above, which was a direct outcome from the Darwin Project. Likewise the EU-funded medicinal plants project, also mentioned above, was, I believe, strongly influenced by the Darwin Project.

Workshop and demonstration notes were prepared in most cases as were reports written by staff completing elements of the project. All these were appended to the various annual reports but are not publicly available, neither are they particularly intended for, or suitable for, formal publication. Information was disseminated to those taking part in the various workshops and demonstrations. Where necessary information was translated verbally to staff whose English was not particularly good.

7. Project Expenditure

Project expenditure ended up being very close to the budget given in the application form. Information is shown in the table below. There were no changes to the budget. The nursery took a little longer to complete that anticipated as described before but this did not affect the budget. There was no variation of more or less than 10% in any of the budget headings. Strong financial control was achieved by having a budget for each element of the project. Each participant was given a figure for food and subsistence and told not to exceed it. Accommodation and travel was arranged directly by David Rae's PA Rachel O'Connor who looked after the finances very carefully.

Total project expenditure for the three year duration of the project

Item	Budget (please indicate which document you refer to if other than your project schedule)	Expenditure	Balance

1. £450 Audit Fee from 03/04 moved to 06/07 at request of Darwin Initiative as audit fee is incurred after the close of the financial year.
2. £4050.60 underspend in 05/06 due to savings on T&S and audit fees

8. Project Operation and Partnerships

The main and only partner was the Royal Botanic Garden Serbithang which is part of the National Biodiversity Centre, Bhutan's National Focal Point for Biodiversity. This was always intended to be the one and only partner and it remained so. Various schools joined in the education workshop but they could not really be considered partners in the same way as RBGS. Meetings were also held with the National Parks and Forestry Service but they were not partners in this project. As explained before, RBGS plans to be significantly involved in biodiversity issues- that, along with public education will be one of its main objectives, but it is not yet in a position to do so. The purpose of the Darwin Project was to help it 'reach up' to become a modern, functioning botanic garden so that it could play its part along with the National Herbarium and National Seedbank as a valued part of NBC which is Bhutan's premier institution leading on biodiversity issues.

RBGS was significantly involved in planning and implementation. The idea for the Darwin project came from a request from a government minister and David Rae was able to secure a British Council grant to visit Bhutan and the Botanic Garden prior to the Darwin Initiative proposal being drafted in order to discuss and plan ideas with Dr Ugyen Tshewang. In this way each of the elements of the project were carefully discussed beforehand to ensure they were wanted. Also, David Rae constantly sought reassurance from Dr Tshewang as the project progressed to ensure that the project was delivering what he wanted in the way that he and his staff wanted. Communication between David Rae and Dr Ugyen Tshewang and between David Rae and Sangay Dema was very strong and, when not able to meet personally, e-mail communication was frequent and effective

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Greenhouse/propagation equipment

Plans were not modified during the course of the project but would have been if consultation had shown that there was a need to do so. No consultation with other Darwin projects in Bhutan was possible as there were no other Darwin Projects in Bhutan. RBGE, however, had another Darwin Project running in Nepal and David Rae was able to have frequent discussions with Dr Mark Watson, leader of that programme at RBGE, to discuss ideas, programmes and administration. Likewise, it was pleasing on the last visit to Bhutan to be able to meet Dr Watson in Kathmandu on the way home and to see his project and meet

some of the staff and government officials involved. Collaboration between RBGS and the Biodiversity Strategy (BS) Office is good as RBGS is government funded and sits within the NBC which is the BS Office and Dr Tshewang is the Director of NBC and therefore also Director (but not day-to-day manager) of RBGS.

Partnership between RBGE and RBGS will certainly continue and we are working on this already. Local partnership between RBGS and local schools is going from strength to strength and with the permanent appointment of Wangmo Moitra as Education Officer this has a real chance of long term success. RBGS is still young (even after the Darwin Project it is only six years old) and so it needs to continue to raise its standards, improve its resources and develop its plans. As it does this more people will visit, community collaboration will grow and it will be able to play an increasing role in conservation and biodiversity issues.

9. Monitoring and evaluation, lesson learning

Monitoring and evaluation took place throughout the project. This was a practical project rather than a scientific project and so there was not a 'science-type' strategy against which to monitor results. Instead we decided that our strategy would be to communicate frequently and honestly to discuss the progress of the project at each stage. At the start of each year David Rae travelled to Bhutan to monitor and evaluate the previous year's work. On each occasion he sat down with Dr Tshewang and, on separate occasions, with Sangay Dema, to discuss each element in detail. We discussed the personnel involved, the targets for each element, what was expected and how long it would take. We did this both in retrospect, ie looking back to the last year, and also looking ahead to the next year. In this way both parties know what to expect and what their obligations would be. In addition to this David Rae spent time with each member of RBGE staff before they departed for Bhutan. He described exactly what to do and how everything would work. He discussed a work plan and also gave them a budget to work to. After they returned there was also a debriefing session to discuss how things had worked out.

Indicators, to demonstrate that the project was working and that elements of the project were being achieved, were easy to gather and evaluate. The logical framework, shown in Appendix I and unmodified since the original application form shows clearly what was expected and therefore it is easy to demonstrate what was achieved. Every single one of the measurable indicators was achieved. We know that some of these are subjective, such as the visual appearance of the Garden, but many are measurable and, as reported in previous annual reports, every one was achieved.

There were some logistical complications but no real problems. This was probably because RBGE has had a long involvement in Bhutan and knew the staff involved and what to expect. It was somewhat inconvenient starting the

project four months later than expected but this was because the Darwin Secretariat asked us to start later (due, apparently, to cash flow problems at DEFRA) rather than any problem on our side. Travel was also quite complicated in both directions and huge credit must go to Rachel O'Connor, David Rae's PA who made all the travel arrangements. While travel by RBGE staff to Kathmandu or Calcutta was quite easy, onward travel had to be arranged through Thimpu using Druk Air (Bhutan's national carrier) only. Visas were also quite slow and difficult to obtain as RBGS staff had to go in person to the Ministry involved in Thimpu to seek special permission for RBGE staff to travel to Bhutan. It was also quite difficult and complicated for RBGS staff to travel to Edinburgh. Travel arrangements had to made for them to fly to Edinburgh via Delhi, but they had to set off without a visa and then had to stay in Delhi for 3-5 days to get a visa from the British authorities. This effectively cut 3-5 days off the time they were able to stay in Edinburgh. Anyway, these were just minor travel problems rather than project problems and the only other slight problem was that it took longer to erect the greenhouse and nursery complex than expected (as described previously). In the end it was completed in the second year rather than first year.

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Preparing nursery beds in the new nursery complex

As described above, there was plenty of internal evaluation and, while there was no formal external evaluation, the project was discussed frequently with visitors and other interested parties. Likewise several presentations, about the whole project and its purpose, were made to staff at RBGE. RBGE's Trustees and governing department SEERAD also know of, and approved of, the Project.

We believe that, as expected, the key lessons were to set out a practical, achievable project that was not over ambitious. The single best piece of advice that we would give prospective applicants is to break down their project into clearly defined elements or mini-projects each of which has a clear purpose, outcomes and budget. In this way it is easy to manage and each party knows what to expect and each can be planned, undertaken, evaluated and then accounted for (financially).

10. Actions taken in response to annual report reviews

We felt that the reports received in response to the Annual Reports were fair and constructive. In general they were very supportive and, we are pleased to say, stated that the project was going well and was well managed.

The main point arising from the Year 1 report concerned the exist strategy and, as a result, we discussed this in detail during David Rae's next visit. We re-affirmed RBGE's long term commitment to Bhutan and the NBC and David Rae was able to reassure Dr Ugyen Tshewang that RBGE would not be cutting ties with Bhutan the moment the Darwin Initiative project was over. In fact RBGE will still have a long term interest in Himalayan Biodiversity for many years into the future. It is a major component of RBGE's Science Strategy and we are also working on the Flora of Nepal. Professor Gibby's visit in Year 3 provided further proof of interest as she was interested in exploring the possibility of working on the ferns of Bhutan. Further evidence comes from the fact that we have been able to find funds for Wangmo Moitra to attend the Botanic Garden Education Conference at Oxford and then the Botanic Garden Education course at RBG Kew. Both these events are happening after the end of the Darwin project. In addition, David Rae is exploring the possibility of creating a horticultural scholarship for Bhutan where one of RBGE's horticulture students can work at RBGS for, maybe, six months after completing their course. Finally, the application for follow-on funding was not successful but we will be thinking very seriously about submitting a full Darwin Initiative application, probably in one or two year's time. I hope these points show a commitment to the future and that RBGE will have an interest in Bhutan and RBGS well after the lifetime of the Darwin Project. To this extent there is no exit strategy as RBGE intends to maintain a long term interest in Bhutan.

The Year 2 Report was generally positive and complimentary. The main point concerned how the project fitted into the overall management plan for the RBGS and within the NBC. This is a fair comment but one that is quite hard to answer

except to say that it does! When the Minister visited RBGE in 2002 his goal was to secure RBGE's help in raising standards at RBGS. During my return visit I thought that the best way to achieve this was through securing Darwin Initiative funding to help the Garden start to achieve its commitments to the CBD. From that moment on both Government Ministers, senior civil servants and the Director of NBC have known that the Darwin project was committed to helping RBGS raise it standards for the reasons explained. All the individual elements of the project have been designed to integrate together for this goal and therefore it is all part of a larger 'game plan'. Everyone knows how the individual elements fit together to achieve this aim and it is written into various strategies but I am afraid that it is not possible for me to ask for these directly. Appendix IV shows some pages from the RBGS Strategy Plan. It shows some of what has been achieved and much of this has been done through the Darwin Project even though it does not say so.

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Example of plant label

In looking up, to see how the RBGS fits into the NBC again it is true to say that it does, but it is difficult to prove it and it is not possible to show strategy plans here. It is important to remember that NBC is still evolving. When the Darwin Project started NBC only had a tiny office, the Herbarium was built but not inhabited and the Genebank was still a building site. The Botanic Garden was the furthest advance but was only three years old. It has been wonderful visiting over

the three years of the project because each time it has been possible to see big advances. After the second year it was possible to see that the Herbarium had been ‘fitted out’, was staffed with permanent staff and was functioning. After the third year it was possible to view the finished Genebank and talk with the staff. The point of listing these events is to demonstrate that the NBC is still very new and that by far and away the main effort over the last three years has been to establish the buildings with permanent, trained staff. This has been a fantastic

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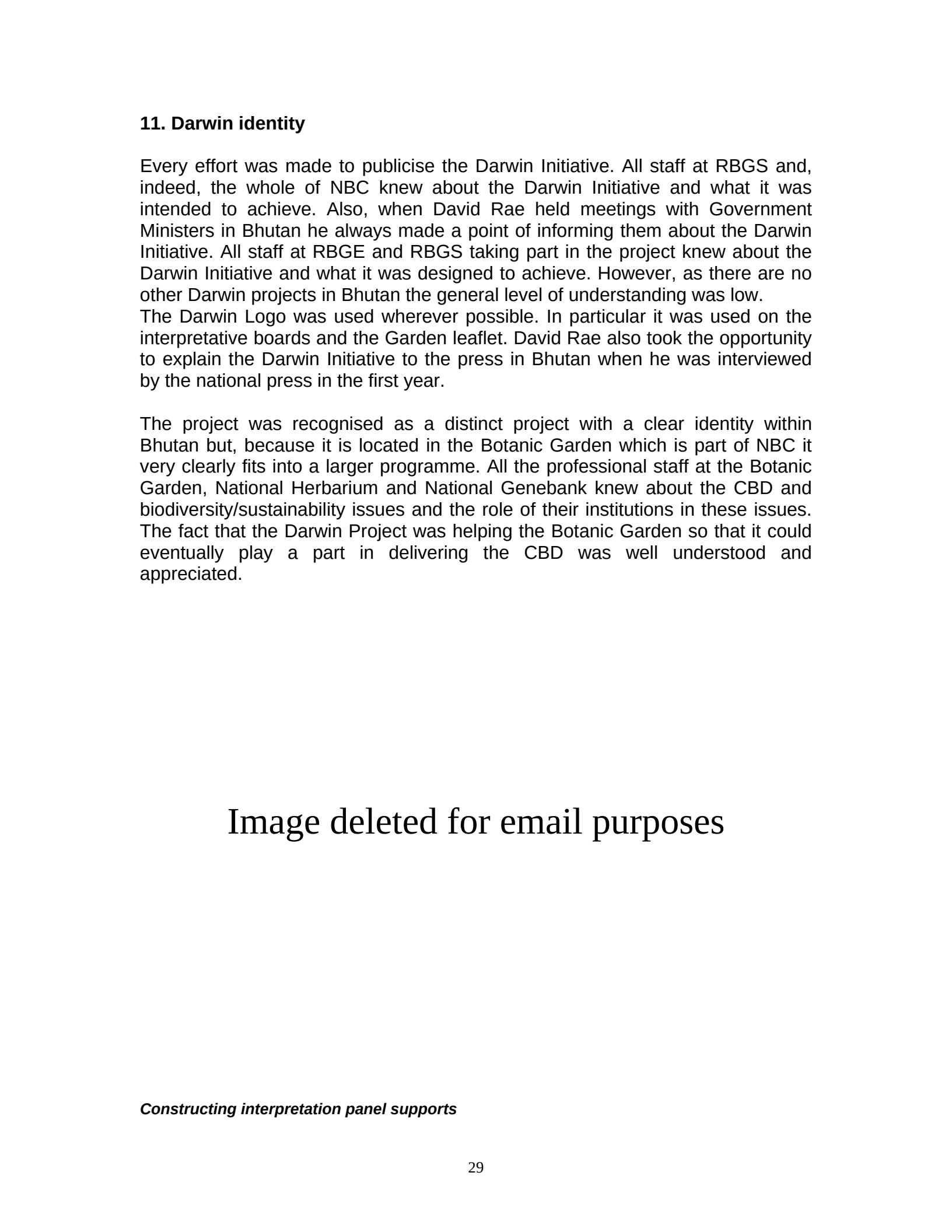
Sign to National Biodiversity and affiliated institutions

achievement but I suppose that it is true to say that strategy plans have not been the primary objective. However, it is absolutely true to say that a lot of thought and careful planning has gone into the three institutions and it is clear how they will all interact and function together but it is probably just a little premature to have evidence of strategy plans and other similar documentation. What is clear, though, is that the individual elements of our Darwin Project were all designed to articulate with articles of the CBD and plug into other existing work to support the purpose of the project.

11. Darwin identity

Every effort was made to publicise the Darwin Initiative. All staff at RBGS and, indeed, the whole of NBC knew about the Darwin Initiative and what it was intended to achieve. Also, when David Rae held meetings with Government Ministers in Bhutan he always made a point of informing them about the Darwin Initiative. All staff at RBGE and RBGS taking part in the project knew about the Darwin Initiative and what it was designed to achieve. However, as there are no other Darwin projects in Bhutan the general level of understanding was low.
The Darwin Logo was used wherever possible. In particular it was used on the interpretative boards and the Garden leaflet. David Rae also took the opportunity to explain the Darwin Initiative to the press in Bhutan when he was interviewed by the national press in the first year.

The project was recognised as a distinct project with a clear identity within Bhutan but, because it is located in the Botanic Garden which is part of NBC it very clearly fits into a larger programme. All the professional staff at the Botanic Garden, National Herbarium and National Genebank knew about the CBD and biodiversity/sustainability issues and the role of their institutions in these issues. The fact that the Darwin Project was helping the Botanic Garden so that it could eventually play a part in delivering the CBD was well understood and appreciated.

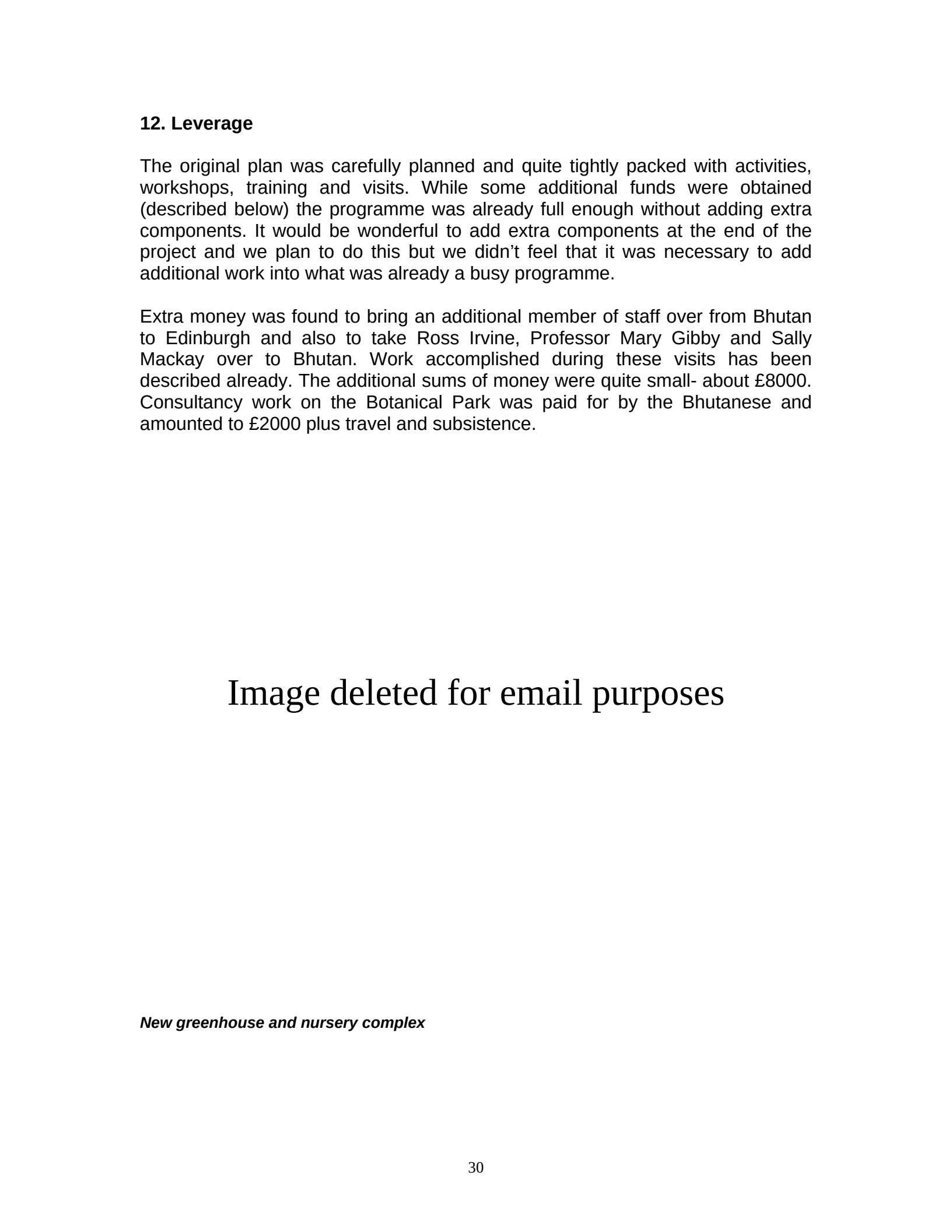


Constructing interpretation panel supports

12. Leverage

The original plan was carefully planned and quite tightly packed with activities, workshops, training and visits. While some additional funds were obtained (described below) the programme was already full enough without adding extra components. It would be wonderful to add extra components at the end of the project and we plan to do this but we didn't feel that it was necessary to add additional work into what was already a busy programme.

Extra money was found to bring an additional member of staff over from Bhutan to Edinburgh and also to take Ross Irvine, Professor Mary Gibby and Sally Mackay over to Bhutan. Work accomplished during these visits has been described already. The additional sums of money were quite small- about £8000. Consultancy work on the Botanical Park was paid for by the Bhutanese and amounted to £2000 plus travel and subsistence.



New greenhouse and nursery complex

13. Sustainability and legacy

We hope that all achievements of the project will endure. The RBGS exists as an entity and our job was to help it function as a modern botanic garden so that it could take its place as a partner institution within the NBC and play its part in fulfilling Bhutan's commitments to the CBD. Each element of the programme had been devised to contribute to this and it is hoped that while each stood alone as a separate project they all added together into a coherent package that would help move the botanic garden along as described. All project staff are employed by NBGS which is government funded and so they will all be retained. Also all the physical resources such as the greenhouse and nursery complex will be retained and used as part of the fabric of the garden. All partners are likely to keep in touch as RBGE has a long term interest in Bhutan and is likely to continue to be involved. We are, already, discussing plans for the future and so we very much plan to keep in touch.

Perhaps the only element that has slipped slightly is the plant records system. The workshop was very successful but with Sangay Dema going to the States for her MSc and with the other pressures of work we feel that this one aspect has slipped at bit and that extra help will be required here. We very much hope that we will be able to reinforce the plant records training outside of Darwin funding over the next year or two.

Funding to continue the project and also extend into the Global Strategy for Plant Conservation that would have linked the Botanic Garden with the Herbarium were sought from the Darwin project follow-on funding scheme but this application was not successful. However, in the letter of reply we were encouraged to seek a further full round of funding in due course and we will be pursuing this in one or two year's time. We really think it would be fantastic to continue the support and now more fully link the work of the Garden with the Herbarium in developing plans to work for the targets in the Global Strategy.

14. Value for money

We believe that the project has been excellent value for money. A lot has been achieved and there is a lot to show for it. Workshops, staff exchanges, training and building work has all taken place under the umbrella of this project and all the staff involved have put in a tremendous effort during the time they have spent in the other country. No money has been wasted and all travel and subsistence ahs been modest. No money has been spent on computers, office equipment or entertainment. All staff have worked exceptionally hard and frequently through weekends.

Evidence to support this comes from the Garden, its staff, annual reports and physical entities such as the nursery complex. A visitor arriving at RBGS now might think that it still looked new and that much was still required to bring it up to

western standards but that person would probably not have seen it three years ago at the start of the project. From David Rae's experience of botanic gardens he is satisfied that a lot has been achieved in a three year period, that it represents excellent value for money and that all staff should be congratulated for their enthusiasm, hard work and commitment.

Both David Rae and Dr Ugyen Tshewang would like to thank the Darwin Initiative for their generous help and support.

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APPENDIX I. LOGICAL FRAMEWORK

Project summary	Measurable indicators	Means of verification	Important assumptions
Goal: To draw on expertise relevant to biodiversity from within the United Kingdom to work with local partners in countries rich in biodiversity but poor in resources to achieve • the conservation of biological diversity, • the sustainable use of its components, and • the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources			
Purpose To build the capacity of the staff and facilities at RBGS so that they can use the resource of the living collections for education, conservation and, eventually, for research so that the institute can contribute effectively to the aims of the CBD and to sustainable development	Visually improved botanic garden landscape. Effective curation of the living collection. Effective communication of biodiversity issues in Bhutan- to residents and visitors. Correctly identified and labelled plants	Visual inspection by Minister of Agriculture, Director of NBC & Director of Hort at RBGE. Functional plant record system & efficient output from nursery. Interpretation plan and educational policy put into place. At least 500 plants correctly labelled	Residents and tourists visit the Botanic Garden either for recreation or information and leave having gained knowledge of Bhutan's bidodiversity and the issues involved in its conservation
Outputs An Interpretation Master Plan indicating the most effective way of using the Garden to highlight important issues concerning Bhutan's Bio-diversity.	A Written Master Plan describing how best to implement an interpretation strategy in the Garden	Physical evidence of interpretation materials, methods and techniques.	Residents and tourists understand the components of Bhutan's Biodiversity and any important issues involved in conserving it.

A Plant Records database in place	A Minimum of 2 trained staff in data entry and management, the Garden sub-divided into plant record zones and information on the collection entered into the database	Participant's attendance records. Database of Plant Collection	The Database is used to catalogue and manage the living collection
A functional nursery established with 2 staff capable of propagation plants from seeds and cuttings	Plants grown from seed or cuttings survive and are grown in the Garden.	Physical evidence of plants being propagated and grown on.	The Nursery continues to be the main method by which new plants enter the collection.
Traditionally printed plant labels installed	At least 500 labels painted and installed. Plants correctly identified	Physical evidence	Visitors able to find out names of plants and basic information about them (e.g.) local names, distribution and uses.
An attractive, well maintained Garden with a well curated collection of plants (NB it must be noted that a fine garden with high standards cannot be fully created within 3 years	At least 6 staff given basic horticultural training. Number of plants in cultivation.	Visible assessment using photographs over the 3 years of the project	An attractive well-maintained garden with a well-curated collection of plants will attract visitors. Without visitors the Garden will not be able to reach it's educational objectives.
An education policy established defining ways in which the Garden can be used for biodiverstiy education.	At least 2 staff trained to use the Garden for educational purposes. A written policy describing ways in which the Garden can be used for educational activities	School groups visit the Garden for classes and events. Diary/Calendar of visits	School children residents and tourists understand the component of Bhutan's biodiversity and any important issues involved in conserving it.

Notes on measurable indicators:

1. A visually improved botanic garden landscape. There is no doubt that the landscape has improved. It could still be better and it will continue to improve but, during the three years of the project, there has been a great improvement with better maintenance and new features.
2. Effective curation of the living collection. Plants have been identified and labelled, new plants are coming out of the nursery and are getting planted (albeit one year later than hoped for due to the delay in construction of the nursery), there is a collection policy to guide curation and there is also an effective plant records database.
3. Effective communication of biodiversity issues in Bhutan- to residents and visitors. An interpretation plan and education policy have both been developed and put into action.
4. Correctly identified and labelled plants. There is still a little way to go on this but virtually all plants have now been identified and given temporary labels and many have now got their permanent labels. These were sent out in batches. All the orchids in the Orchidarium have been labelled and most of the dominant trees in the garden. The focus towards the end was on herbaceous plants.
5. A written master plan describing how best to implement an interpretation strategy in the garden. This was done and included in the year 2 report. As a direct result 12 interpretation panels have been designed and constructed.
6. A minimum of 2 trained staff in data entry and management, the garden sub-divided into plant record zones and information on the collection entered into the database. All this was done and a report was produced and included in the year 2 report- four staff received the training. This one aspect of the project has, I believe, slipped a little due to Sangay Dema being away in the Sates and also because of other pressures. None-the-less the staff are trained and I am assured that they will be returning to this important area shortly.
7. Plants grown from seed or cuttings survive and are grown in the garden. Yes, this is happening but, as reported before, the greenhouse and nursery took a little longer to construct than expected and so this aspect was a little delayed. It is working now though.
8. At least 500 labels painted and installed. Plants correctly identified. Virtually all plants have been identified and given temporary labels. We decided to use traditional botanic garden labels rather than painted labels as described before. I'm not sure if exactly 500 have been engraved but it must be somewhere near this figure. All the orchids and dominant trees have been labelled.

9. At least 6 staff given basic horticultural training. In the end 7 staff from RBGS came to RBGE for horticultural training. In addition to this numerous more staff were given horticultural training in Bhutan.
10. Number of plants in cultivation. I have not been able to ascertain exactly how many plants are in the garden but there are many more than when the project started.
11. At least 2 staff trained in the use of the garden for educational purposes. A written policy describing ways in which the Garden can be used for educational activities. A workshop with staff from the garden and others was given and a policy produced. The garden is now being actively used for educational activities. RBGS has created a permanent education officer post.

APPENDIX II. OUTPUTS

Outputs are shown using the Darwin Initiative Standard Output Measures.

Code	Total to date (reduce box)	Detail (←expand box)
Training Outputs		
2	Number of Masters qualifications obtained	Sangay Dema was so enthused and inspired by the project that she decided to enrol on an MSc- this was not funded by Darwin but came as a direct result of it
6a	Number of people receiving other forms of **short-term** education/training (i.e not categories 1-5 above)	7 staff from RBGS came to RBGE for training and more than 30 staff and others received training at RBGS
6b	Number of training weeks not leading to formal qualification	25 weeks in total including education, horticulture, plant records and databasing, propagation and nursery work etc, both at RBGE and RBGS
7	Number of types of training materials produced for use by host country(s)	1 type only- written notes that have been included in annual reports
Research Outputs		
8	Number of weeks spent by UK project staff on project work in host country(s)	35 person weeks (staff were usually there together)
12b	Number of computer-based databases enhanced (containing species/genetic information) and handed over to host country	1- BG Recorder

Dissemination Outputs		
14a	Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work	3- Propagation & nursery work, Curation & plant records, Education & interpretation
15a	Number of national press releases or publicity articles in host country(s)	1- in national newspaper
15d	Number of local press releases or publicity articles in UK	1- in botanic garden publication
Physical Outputs		
20	Estimated value (£s) of physical assets handed over to host country(s)	
21	Number of permanent educational/training/research facilities or organisation established	1 greenhouse and nursery established
23	Value of additional resources raised for project	

APPENDIX III. Articles of the CBD which best describe the project.

Article 9 30%
Article 13 70%
Articles 8, 12, 16, 17 and 18 in the future

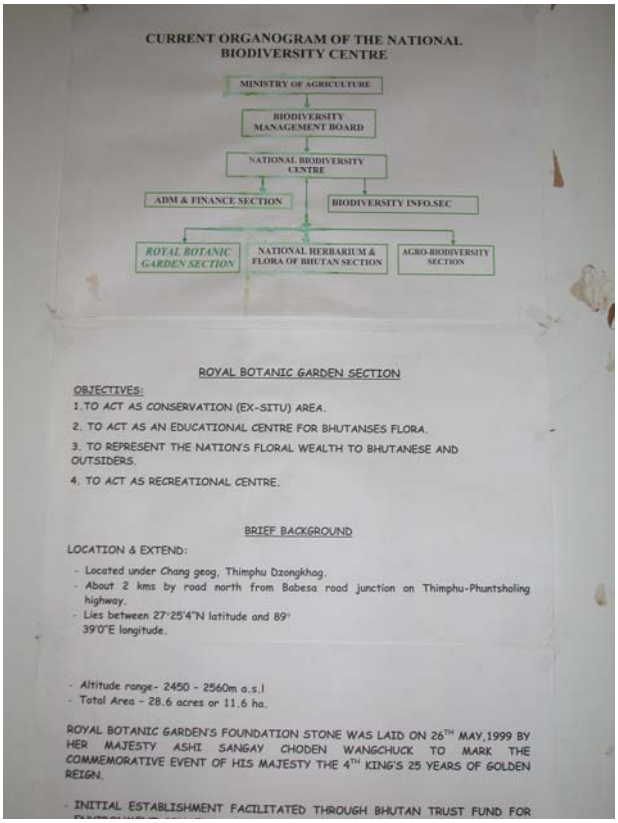
Project Contribution to Articles under the Convention on Biological Diversity		
Article No./Title	**Project %**	**Article Description**
6. General Measures for Conservation & Sustainable Use		Develop national strategies that integrate conservation and sustainable use.
7. Identification and Monitoring	See note below	Identify and monitor components of biological diversity, particularly those requiring urgent conservation; identify processes and activities that have adverse effects; maintain and organise relevant data.
8. In-situ Conservation	See note below	Establish systems of protected areas with guidelines for selection and management; regulate biological resources, promote protection of habitats; manage areas adjacent to protected areas; restore degraded ecosystems and recovery of threatened species; control risks associated with organisms modified by biotechnology; control spread of alien species; ensure compatibility between sustainable use of resources and their conservation; protect traditional lifestyles and knowledge on biological resources.
9. Ex-situ Conservation	20%	Adopt ex-situ measures to conserve and research components of biological diversity, preferably in country of origin; facilitate recovery of threatened species; regulate and manage collection of biological resources.
10. Sustainable Use of Components of Biological Diversity	See note below	Integrate conservation and sustainable use in national decisions; protect sustainable customary uses; support local populations to implement remedial actions; encourage co-operation between governments and the private sector.
11. Incentive Measures		Establish economically and socially sound incentives to conserve and promote sustainable use of biological diversity.
12. Research and Training	50% & See note below	Establish programmes for scientific and technical education in identification, conservation and sustainable use of biodiversity components; promote research contributing to the conservation and sustainable use of biological diversity, particularly in developing countries (in accordance with SBSTTA recommendations).

13. Public Education and Awareness	50%	Promote understanding of the importance of measures to conserve biological diversity and propagate these measures through the media; cooperate with other states and organisations in developing awareness programmes.
14. Impact Assessment and Minimizing Adverse Impacts		Introduce EIAs of appropriate projects and allow public participation; take into account environmental consequences of policies; exchange information on impacts beyond State boundaries and work to reduce hazards; promote emergency responses to hazards; examine mechanisms for re-dress of international damage.
15. Access to Genetic Resources		Whilst governments control access to their genetic resources they should also facilitate access of environmentally sound uses on mutually agreed terms; scientific research based on a country's genetic resources should ensure sharing in a fair and equitable way of results and benefits.
16. Access to and Transfer of Technology	See note below	Countries shall ensure access to technologies relevant to conservation and sustainable use of biodiversity under fair and most favourable terms to the source countries (subject to patents and intellectual property rights) and ensure the private sector facilitates such assess and joint development of technologies.
17. Exchange of Information	See note below	Countries shall facilitate information exchange and repatriation including technical scientific and socio-economic research, information on training and surveying programmes and local knowledge
19. Bio-safety Protocol		Countries shall take legislative, administrative or policy measures to provide for the effective participation in biotechnological research activities and to ensure all practicable measures to promote and advance priority access on a fair and equitable basis, especially where they provide the genetic resources for such research.
Total %	**100%**	

Note:

Percentage figures for the end of the project have been filled in (ie for 2006). However, the whole\point of the Darwin project was to raise standards at RBGS so that it could contribute to the CBD in the future. If, then, current progress is maintained RBGS will increasingly be able to take part in these other Articles (but they are not doing so right now).

APPENDIX IV. Selected pages from the RBGS Strategy Plan



CURRENT ORGANOGRAM OF THE NATIONAL BIODIVERSITY CENTRE

MINISTRY OF AGRICULTURE

BIODIVERSITY MANAGEMENT BOARD

NATIONAL BIODIVERSITY CENTRE

ADM & FINANCE SECTION

BIODIVERSITY INFO.SEC

ROYAL BOTANIC GARDEN SECTION

NATIONAL HERBARIUM & FLORA OF BHUTAN SECTION

AGRO-BIODIVERSITY SECTION

ROYAL BOTANIC GARDEN SECTION

OBJECTIVES:

1. TO ACT AS CONSERVATION (EX-SITU) AREA.
2. TO ACT AS AN EDUCATIONAL CENTRE FOR BHUTANSES FLORA.
3. TO REPRESENT THE NATION'S FLORAL WEALTH TO BHUTANESE AND OUTSIDERS.
4. TO ACT AS RECREATIONAL CENTRE.

BRIEF BACKGROUND

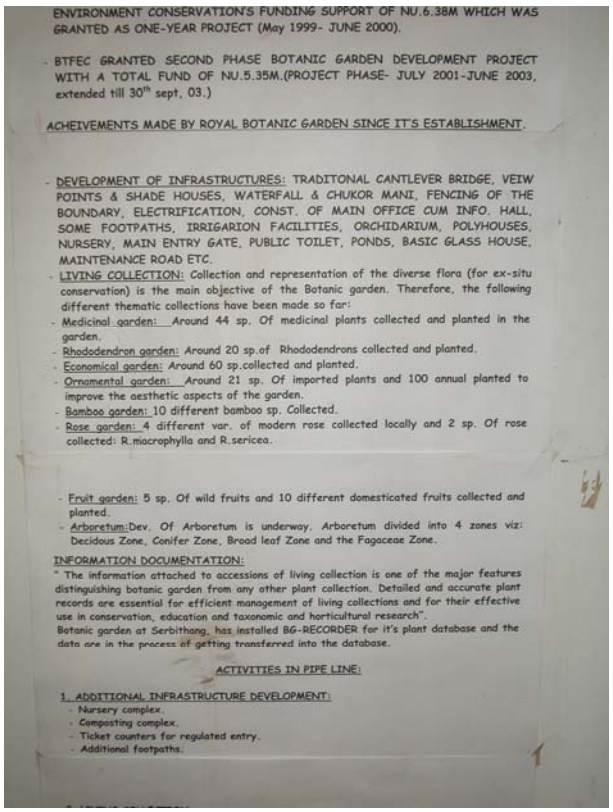
LOCATION & EXTEND:

- Located under Chang geog, Thimphu Dzongkhag.
- About 2 kms by road north from Babesa road junction on Thimphu-Phuntsholing highway.
- Lies between 27°25'4"N latitude and 89° 39'0"E longitude.

- Altitude range- 2450 – 2560m a.s.l
- Total Area – 28.6 acres or 11.6 ha.

ROYAL BOTANIC GARDEN'S FOUNDATION STONE WAS LAID ON 26TH MAY,1999 BY HER MAJESTY ASHI SANGAY CHODEN WANGCHUCK TO MARK THE COMMEMORATIVE EVENT OF HIS MAJESTY THE 4TH KING'S 25 YEARS OF GOLDEN REIGN.

- INITIAL ESTABLISHMENT FACILITATED THROUGH BHUTAN TRUST FUND FOR



ENVIRONMENT CONSERVATION'S FUNDING SUPPORT OF NU.6.38M WHICH WAS GRANTED AS ONE-YEAR PROJECT (May 1999- JUNE 2000).

- BTFEC GRANTED SECOND PHASE BOTANIC GARDEN DEVELOPMENT PROJECT WITH A TOTAL FUND OF NU.5.35M.(PROJECT PHASE- JULY 2001-JUNE 2003, extended till 30th sept, 03.)

ACHEIVEMENTS MADE BY ROYAL BOTANIC GARDEN SINCE IT'S ESTABLISHMENT.

- DEVELOPMENT OF INFRASTRUCTURES: TRADITONAL CANTLEVER BRIDGE, VEIW POINTS & SHADE HOUSES, WATERFALL & CHUKOR MANI, FENCING OF THE BOUNDARY, ELECTRIFICATION, CONST. OF MAIN OFFICE CUM INFO. HALL, SOME FOOTPATHS, IRRIGARION FACILITIES, ORCHIDARIUM, POLYHOUSES, NURSERY, MAIN ENTRY GATE, PUBLIC TOILET, PONDS, BASIC GLASS HOUSE, MAINTENANCE ROAD ETC.
- LIVING COLLECTION: Collection and representation of the diverse flora (for ex-situ conservation) is the main objective of the Botanic garden. Therefore, the following different thematic collections have been made so far:
- Medicinal garden: Around 44 sp. Of medicinal plants collected and planted in the garden.
- Rhododendron garden: Around 20 sp.of Rhododendrons collected and planted.
- Economical garden: Around 60 sp.collected and planted.
- Ornamental garden: Around 21 sp. Of imported plants and 100 annual planted to improve the aesthetic aspects of the garden.
- Bamboo garden: 10 different bamboo sp. Collected.
- Rose garden: 4 different var. of modern rose collected locally and 2 sp. Of rose collected: R.macrophylla and R.sericea.

- Fruit garden: 5 sp. Of wild fruits and 10 different domesticated fruits collected and planted.
- Arboretum:Dev. Of Arboretum is underway. Arboretum divided into 4 zones viz: Deciduous Zone, Conifer Zone, Broad leaf Zone and the Fagaceae Zone.

INFORMATION DOCUMENTATION:

" The information attached to accessions of living collection is one of the major features distinguishing botanic garden from any other plant collection. Detailed and accurate plant records are essential for efficient management of living collections and for their effective use in conservation, education and taxonomic and horticultural research".
Botanic garden at Serbithang, has installed BG-RECORDER for it's plant database and the data are in the process of getting transferred into the database.

ACTIVITIES IN PIPE LINE:

1. ADDITIONAL INFRASTRUCTURE DEVELOPMENT:
   - Nursery complex.
   - Composting complex.
   - Ticket counters for regulated entry.
   - Additional footpaths.

Botanic garden at Seruthany, has installed BG-RECORDER for it's plant database and the data are in the process of getting transferred into the database.

ACTIVITIES IN PIPE LINE:

1. ADDITIONAL INFRASTRUCTURE DEVELOPMENT:

- Nursery complex.
- Composting complex.
- Ticket counters for regulated entry.
- Additional footpaths.

2. LIVING COLLECTION:

- Complete the collections for thematic garden set ups.
- Improve soil condition and creation of microenvironment.
- Expand collection from other ecological zones through dev. Of artificial environment.
- Dev. of collection policy to guide the collections of plants.

3. RESEARCH & EDUCATION:

- Initiate adaptive research on propagation techniques of some unique wild flora in collaboration with other RCs and relevant institutes.
- Explore plants of non-conventional use eg: native plants with ornamental value.

- Dev. Strategy for enhancing the use of Botanic garden for education.
- Set up/host webpage for the garden to disseminate information on it's collection and relevant info.

4. DEV. OF BRANCH GARDENS:

- Alpine garden and Sub-tropical gardens depending need analysis and the availability of donor support.

5. DEV. OF TECHNICAL CAPACITY OF THE GARDEN STAFF AND GARDENERS:

-Through on-the job and in-house trainings, exchange visits etc.

6. DEV. OF SUSTANABILITY STRATEGY:

- Formation of board of trustees & membership.
- Leasing out of the recreational facilities.
- Introduction of entry/user fees.
- Setting up of garden center.
- Voluntary programs.
- Consultancy works.

Appendix V: Darwin Contacts

To assist us with future evaluation work and feedback on your report, please provide contact details below.

Project Title	Institutional Capacity Building and Training, Royal Botanic Garden Serbithang, Bhutan
Ref. No.	162 / 12 / 024
UK Leader Details	
Name	Dr David Rae
Role within Darwin Project	Joint Project Leader
Address	Royal Botanic Garden Edinburgh, 20a Inverleith Row, Edinburgh, EH3 5LR
Phone	
Fax	
Email	
Other UK Contact (if relevant)	
Name	
Role within Darwin Project	
Address	
Phone	
Fax	
Email	
Partner 1	
Name	Dr Ugyen Tshewang
Organisation	Royal Botanic Garden Serbithang
Role within Darwin Project	Joint Project Leader
Address	National Biodiversity Centre, PO Box 875, Serbithang, Bhutan
Fax	
Email	
Partner 2 (if relevant)	
Name	Mrs Sangay Dema
Organisation	Royal Botanic Garden Serbithang
Role within Darwin Project	Curator
Address	c/o National Biodiversity Centre, PO Box 875, Serbithang, Bhutan
Fax	
Email	