

**DARWIN INITIATIVE FOR SURVIVAL OF SPECIES
FINAL REPORT**

1 Basic Project Details

Project Title (162/5/090)	Darwin Technical Handbook for Botanic Gardens
Contractor	Botanic Gardens Conservation International (BGCI)
Collaborating institute(s)	BGCI network of botanic gardens worldwide
Grant Round	4
Grant Value	£39,520

2 Project Expenditure

Total grant expenditure

Breakdown of expenditure	Rent, rates, heating, lighting, cleaning
	Postage, telephone, stationary
	Travel, subsistence
	Printing
	Conferences, seminars (Consultant editors)
	Capital items: language computer packages
	Other
	Salaries

No variations in expenditure

3 Project Background/Rationale

Why was the project needed? Please explain the project development process?

Botanic Gardens Conservation International (BGCI) was set up to build an enduring worldwide network of botanic gardens for plant conservation and sustainable development.

BGCI receives many requests for information and advice from botanic gardens throughout the world on technical and management topics and for advisory missions. There are no comprehensive reference works available on the management of botanic garden. The literature concerning practical aspects of garden management and collection maintenance is extremely dispersed and often difficult to access, especially for institutions in developing countries where financial resources for libraries is limited. Many of the texts that do exist are in English and are therefore inaccessible to institutions in countries where English is not the first language. Written procedures are rare even in the most developed gardens and in response to these requests BGCI has accumulated a great deal of information from many sources. There was a clear need for such resources to be presented in the form of a Technical Handbook which will help botanic gardens improve the management of their scientific, conservation and educational collections of plants and thus enhance their capacity for biodiversity conservation.

Additional materials for inclusion in the Handbook could be sought from BGCI member botanic gardens, contacts in the field and other technical experts.

How was it related to conservation priorities in the host country?

Botanic gardens have a central role in plant conservation and sustainable development and are well placed to contribute to their national strategies and action plans to implement international conventions such as the CBD, CITES, the Convention on Wetlands, the World Heritage Convention, the United Nations Framework Convention on Climate Change, the Convention to Combat Desertification and Agenda 21.

How was the project intended to assist the host country to meet its obligations under the Biodiversity Convention?

The publication of *The Darwin Technical Handbook for Botanic Gardens* will help botanic gardens maximise their contribution towards plant conservation.

Botanic gardens can contribute to plant conservation in many ways:

- Maintaining genetic resources as living plants, seed banks and tissue culture;
- Research - from plant taxonomy, ecology to breeding systems. All these areas are essential for species recovery programmes and reintroduction of plants into the wild and habitat restoration (such as developing techniques to reintroduce these Dragon Trees into the wild in the Las Palmas Botanic Garden in the Canary Islands);
- Horticulture; developing propagation and cultivation methods for plants which have not been in cultivation is an essential part of any reintroduction programme. A major cause of biodiversity loss is the collection of wild plants for horticulture, medicine and food. Bringing plants into cultivation takes the pressure off the wild populations and can generate income and promote trade (a good example is Honey Bush Tea (*Cyclopia*) in South Africa which has been traditionally collected destructively from the wild. The National Botanical Institute, Kirstensbosch discovered the impact of smoke on the germination of many South African species and were able to mass propagate the Honey Bush. Now about 40 communities in impoverished areas have industrial-scale operations for the production of Honey Bush Tea);
- Education programmes for the public to promote environmental awareness and promote sustainable living. Globally, botanic gardens receive more than 150 million visitors a year.

This Handbook is a fundamental and accessible source for capacity building in botanic gardens. This particularly applies to botanic gardens in countries rich in biodiversity but poor in financial and technical resources. There is no known similar resource available for botanic gardens anywhere in the world. The Handbook will be a major contribution to the conservation of native plants and their sustainable use and as such will help countries fulfil their obligations under the Convention on Biological Diversity.

Was there a clear 'end user' for the project in the host country? Who?

Yes, botanic gardens and their staff worldwide (currently 2,200 in 153 countries of which over 500 in 112 countries are members of BGCI)

4 Project Objectives

What were the objectives of the project (as stated in the original application form)?

The main objective of this project is to produce a clear technical Handbook for the management of botanic gardens, to raise the scientific, conservation and educational value of the plant collections in botanic gardens worldwide. This is a companion volume to other Botanic Gardens Conservation International publications, *The Botanic Gardens Conservation Strategy* (1989) and other technical manuals on such subjects as plant reintroductions, data management, environmental education and CITES and the new *International Agenda for Botanic Gardens in Conservation* (2000).

Were the objectives of the project revised?

No

Have the objectives been achieved? If so, how?

Yes, the Handbook was published in English, Spanish and French and distributed to over 500 botanic gardens worldwide.

Chapters were prepared by a series of expert authors. Additional information was obtained from questionnaires sent to botanic gardens and from many other sources. The chapters were then reviewed extensively, to ensure the Manual would be useful and relevant to as many botanic gardens as possible and reflects good practice in botanic gardens. The French and Spanish translations were similarly extensively reviewed.

We have had very good feed back as shown below:

Written comments on the Darwin Technical Manual for Botanic Gardens

"The manual looks great! Good job."

Frank Telewski (W.J. Beal Botanical Garden and Campus Woody Plant Collection, East Lansing, U.S.A.) 18 Nov 1998

"I congratulate you and Jane Greene for this very useful and well done document"

Edelmira Linares Mazari (Universidad Nacional Autónoma de México, México) 13 November 1998

"Have just finished browsing through my "Darwins" botanic garden guide and I really was impressed with the way it was constructed I found it a most noble effort and so thought I should drop off a quick note of thanks . . ."

Ken du Plooy (Belize) 6 December 1998

"Congratulations for the Darwin Technical Manual for Botanic Gardens. It is absolutely useful and it's just the thing we need. Thank you."

Krassimir Koshev (University Botanic Gardens, Balchik & Varna, Sofia, Bulgaria) 13 November 1998

"I have just had the opportunity to look through the manual and it's wonderful. Great job!"

Carol Line (American Association of Botanical Gardens and Arboreta) 27 October 1998

"Congratulations on the completion of the Darwin Technical Manual! I've read it through and it certainly is comprehensive - good job done! Even Darwin would have been pleased"

Susan Wallace (U.S.A.) 9 November 1998

" and more specifically to thank you for that most valuable volume " The Darwin Technical Manual for Botanic Gardens . . . It is a very useful reference for our technical staff who are continuing in the development of our Botanic Gardens."

P.A.B. Isaacs, Chief Agricultural Officer, Ministry of Agriculture and Labour, St Vincent and the Grenadines, West Indies 30 April 1999

If relevant, what objectives have not been achieved, or only partially achieved, and why?

Not relevant

5 Project Outputs

What output targets, if any, were specified for the project?

Research Output Code No. 10:

- 2,000 copies of the English version of *The Darwin Technical Handbook for Botanic Gardens* were published and have been sent to over 500 botanic gardens in over 100 countries
- 500 copies each of the Spanish and in French versions of the Handbook were published and have been sent to 120 botanic gardens in 40 countries.

Have these been achieved?

Yes, apart from the distribution of the French version which will be distributed in March.

If relevant, what outputs were not achieved, or only partially achieved, and why?

Not relevant

Were any additional outputs achieved?

Yes, the Manual has been translated into Portuguese and Korean and distributed to all Portuguese-speaking and Korean-speaking gardens respectively.

If output targets were not specified, please state the outputs achieved by the project. Outputs from List of Standard Output Measures:

Training output Code No. 6A

- Distributed to all botanic garden of Colombia as part of the implementation of the Darwin project for plant conservation and information management for botanic gardens in Colombia between BGCI, the National Network of Botanic Gardens of Colombia and the von Humboldt Institute
- Distributed at the Plants Conservation Techniques Course held at the Royal Botanic Gardens, Kew in 1999 attended by 12 participants from 12 countries
- Distributed at the Diploma Course in Botanic Garden Management in July and August 2000 attended by 13 participants from 13 countries

Dissemination outputs Code No. 14. D.

- Launch of the English version at the Fifth International Botanic Gardens Conservation Congress at Kirstenbosch, South Africa, in September, 1998
- Paper given by Dr Etelka Leadlay on *The Darwin Technical Handbook for Botanic Gardens* at the Fifth International Botanic Gardens Conservation Congress at Kirstenbosch, South Africa, in September, 1998
- Launch of the Portuguese version at the 50th Brazilian Botanical Congress in Blumenau, Santa Caterina, Brazil in July, 1999 by the Environment Minister, Dr Jose Sarney Filho and the Brazilian Botanic Gardens Network President and Rio de Janeiro Botanic Garden Director, Dr Sergio de Almeida Bruni
- Launch of the Portuguese version at the Rio de Janeiro Botanic Garden, Brazil to the Embassies of Portuguese-speaking countries in September, 1999

Financial outputs Code no. 23

- Publication and distribution of Korean and Portuguese Manuals: estimated value of £30,000 (£15,000 each)

6 Project Operation/Management

Research projects

Not relevant

Training projects

The Manual has become an accepted handbook for in-service training in many institutions. The black and white format photocopies well and copies have been used for individuals.

Did any issues or difficulties arise in running and managing this project?

Yes. A great many people were involved with this project worldwide. Chapters were prepared by a series of expert authors. Additional information was obtained from questionnaires sent to botanic gardens and from many other sources. The chapters

were then peer reviewed extensively, to ensure the Manual would be useful and relevant to as many botanic gardens as possible and reflect good practice in botanic gardens. The French and Spanish translations were similarly extensively reviewed. This process for eleven chapters took much longer than expected, as we were relying on voluntary assistance and the drafts were sent by post. E-mail was much more reliable at the translation stage.

7 Project Impact

To what extent has the project assisted the host country to meet its obligations under the Biodiversity convention, or to what extent is it likely to do so in the future?

The publication of *The Darwin Technical Handbook for Botanic Gardens* will help to raise the scientific, conservation and educational value of the plant collections in botanic gardens worldwide. This particularly applies to countries rich in biodiversity but poor in financial and technical resources. No other similar resources are available for botanic gardens elsewhere in the world –this is the first ever botanic garden handbook. The Handbook has eleven chapters: 1 - Planning and Management Techniques, 2 - Landscape and Construction, 3 - Collections Policy, 4 - Garden and Collections Management, 5 - Horticulture, 6 - Equipment and Machinery, 7 - Plant Records, 8 – Interpretation, 9 - Training and Botanic Gardens, 10 - Networks and Support, 11 – Funding.

The Manual is a major contribution for raising the capacity of botanic gardens to conserve and sustainably-use plants and as such will help countries fulfil their obligations under the Convention on Biological Diversity.

The compilation of *The Darwin Technical Handbook for Botanic Gardens* involved 87 people from 22 countries. Most people were very willing to comment and contribute to this work and it certainly has enhanced the botanic garden network worldwide.

8 Sustainability

Did the collaborating institutes (host country institutes(s)) contribute resources to this project?

We are indebted to the following for their contributions to the Manual through writing chapters, sections and items, completing questionnaires, editing, proof-reading and providing comments:

Noellia Alvarez, Royal Botanic Gardens, Kew, U.K.; Miguel Angel Perez Farrera, Instituto de Historia Natural de Chiapas, Tuxtla Gutiérrez, Mexico; Ally Ashwell, Kirstenbosch National Botanical Garden, South Africa; Michael Avishai, Jerusalem Botanical Gardens, Israel; Isabelle Bagdassarian, Bordeaux, France; Don Blaxell, Royal Botanic Gardens, Sydney, Australia; Isabelle Brun, Jardin Botanique de la Ville de Bordeaux, France; James Carter, Queen Margaret College, Edinburgh, U.K.; Carrick Chambers, Sydney, Australia; Melany Chapin, National Tropical Botanic Garden, Hawaii, U.S.A; Judy Cheney, Cambridge University Botanic Garden, U.K.; Colin Clubbe, Royal Botanic Gardens, Kew, U.K.; Jim Cone, Royal Tasmanian

Botanical Gardens, Hobart, Australia; Blaise Cooke, London, U.K.; John Cortes, Gibraltar Botanical Gardens; James Cullen, Cambridge, U.K.; John Davey, London, U.K.; Maïté Delmas, Museum National d'Histoire Naturelle, Paris, France; Fiona Dennis, BGCI, U.K.; Juan de Dios Muñoz, Jardín Botánico Oro Verde, Paraná, Argentina; Ian Darwin Edwards, Royal Botanic Garden, Edinburgh, U.K.; Miguel Elechosa, Jardín Botánico 'Arturo E. Ragonese', Buenos Aires, Argentina; Judith Evans Parker, U.S.A.; Gennady Firsov, Botanic Gardens of the Komarov Botanical Institute, St Petersburg, Russia; Mark Flanagan, Savill Garden, U.K.; Marie Fontaine, Museum National d'Histoire Naturelle, Paris, France; Julie Foster and colleagues, Australian National Botanic Gardens, Canberra, Australia; David Galbraith, Royal Botanical Gardens, Hamilton, Canada; Juli Hadiah, UPT Balai Pengembangan Kebun Raya, Bogor, Indonesia; Ole Hamann, Kobenhavns Universitets Botaniske Have, Denmark; He Shan-An, Nanjing Botanic Garden Mem. Sun Yat-Sen, China; Esteban Hernández Bermejo, Jardín Botánico de Córdoba, Córdoba, Spain; Maryke Honig, Kirstenbosch National Botanical Garden, South Africa; Charles Hubbuch, Fairchild Tropical Garden, Miami, U.S.A.; Feng Huiling, Fairy Lake Botanic Garden, Shenzhen, China; David Hunt, Dorset, U.K.; Ailene Isaf, BGCI, U.K.; Andy Jackson, Royal Botanic Gardens, Kew, U.K.; Michael Kristiansen, U.S.A.; Victor Kuzevnov, Botanic Garden of Irkutsk State University, Russia; Karine Lefevre, Jardin Botanique de la Ville de Bordeaux, France; David Lentz, New York Botanical Garden, U.S.A.; Edelmira Linares Mazari, Universidad Nacional Autónoma de México, México; Carmen López Jiménez, Jardín Botánico de Córdoba, Spain; Antonio López-Quintana, Universidad del País Vasco, Bilbao, Spain; Jo Lopez-Real, Wye College, U.K.; Cédric Magimel, Bordeaux Botanic Garden, France; Enriqueta Martín-Consuegra, Jardín Botánico de Córdoba, Spain; Paul Matthew, Glasgow Botanic Gardens, U.K.; Li Mei, Nanjing Botanic Garden Mem. Sun Yat-Sen, China; Sue Minter, Chelsea Physic Garden, U.K.; Ana Maria Molina, Jardín Botánico 'Arturo E. Ragonese', Buenos Aires, Argentina; Peter Morris, Royal Botanic Gardens, Kew, U.K.; Elisha Murimba, Vumba Botanical Garden, Zimbabwe; Patrick Muthoka, National Museums of Kenya, Nairobi, Kenya; Monica de Navarro, Fundación Botánica de los Andes, Quito, Ecuador; Joaquín Navarrete Navarro, Jardín Botánico de Córdoba, Spain; Jennifer Ng, Singapore Botanic Gardens, L.G. Nkoloma, National Herbarium & Botanic Gardens of Malawi, Zomba, Malawi; Peter Olin, Minnesota Landscape Arboretum, Chanhassen, U.S.A.; Ian Oliver, Karoo National Botanical Garden, South Africa; George Owusu-Afriyie, Aburi Botanic Gardens, Ghana; Bernard Payne, Hampshire, U.K.; Fiona Powrie, Kirstenbosch National Botanical Garden, South Africa.; David Rae, Royal Botanic Garden, Edinburgh, U.K.; Philippe Richard, Jardin Botanique de la Ville de Bordeaux, France; Maricela Rodríguez Acosta, Jardín Botánico 'Louise Wardle de Camacho', Mexico; Loïc Ruellan, Conservatoire Botanique National de Brest, France; Tania Sampaio Pereira, Jardim Botânico do Rio de Janeiro, Brazil; Marcela Sanchez, Jardín Botánico 'Arturo E. Ragonese', Buenos Aires, Argentina; Andrew Smith, Royal Tasmanian Botanical Gardens, Hobart, Australia; Sukendar, UPT Balai Pengembangan Kebun Raya, Bogor, Indonesia; Tan Puay Yok, Singapore Botanic Gardens; Frank Telewski, W.J. Beal Botanical Garden and Campus Woody Plant Collection, East Lansing, U.S.A.; Jacob Thomas, Tropical Botanic Garden and Research Institute, Kerala, India; Walden R. Valen, Strybing Arboretum and Botanical Gardens, San Francisco, U.S.A.; Bert van den Wollenberg, BGCI & Utrecht University Botanic Garden, The Netherlands; Andrew Vovides, Instituto de Ecolgia, Xalapa, Mexico; Timothy Walker, Oxford University Botanic Garden, U.K.; Susan Wallace-Olson, Florida, U.S.A.; Kerry Walter, Royal Botanic

Garden, Edinburgh, U.K.; Isabelle Williams, Paris, France; Julia Willison, BGCI, U.K.; John Winter, Kirstenbosch National Botanical Garden, South Africa; Maureen Wolfson, Pretoria National Botanical Garden, South Africa; Diane Wyse Jackson, BGCI, U.K.; Peter Wyse Jackson, BGCI.

If so, what is the monetary value of the resources committed to the project by the collaborating institutes

Each collaborator would have spent an average two days work (14 hours) At BGCI we calculate our time as £20.00/hour. In U.K. currency the contribution would be £280 per person and for 87 people £24,360.

What is the monetary value of resources generated for the project from other sources?

Publication and distribution of Korean and Portuguese Manuals: estimated value of £30,000 (£15,000 each)

Has the project acted as catalyst for the other projects/initiatives in the host country? Is it likely to do so in the future?

Yes, the Manual has been translated into Portuguese and Korean and distributed to all Portuguese-speaking and Korean-speaking gardens respectively. There has been interest in translating the Manual into Italian and Chinese.

9 Outcomes in the Absence of Darwin Funding

Had the Darwin funding been unavailable for the project, what would have been the most likely outcome:

The project would have been delayed indefinitely, unless other funding could have been found. Publishing projects are often difficult to fund, but this work has reached a very large and wide audience, internationally. Botanic gardens employ between one and 500 staff, therefore it is not over-optimistic to estimate that the Manual has been referred to by more than 4,500 people (800 copies distributed and read by 5 per garden).

Had this project not been undertaken, how would the users/beneficiaries of the project have met their requirements?

With difficulty, training courses would have to start at a more simple level. This Manual raises the capacity of all personnel in the garden. No similar training resources are available.

Would other organisations/initiatives have been able to meet their needs?

No, BGCI is unique in having access to a world network of botanic gardens (BGCI has over 500 members in 112 countries - this manual was produced in collaboration with 87 people from 22 countries), relevant information in the form of library

materials, databases and contacts in the wider conservation community to raise the capacity of botanic gardens for plant conservation and sustainable living.

10 Key Points

What would you identify as the key success factors of this project?

The distribution of a clear, concise, technical handbook for the management of botanic gardens, to raise the scientific, conservation and educational value of living plant collections in botanic garden worldwide. Botanic gardens employ between one and 500 staff, therefore it is not optimistic to estimate that the Manual has been referred to by more than 4,500 people (800 copies distributed read by 5 per garden). This Manual was written in collaboration with 87 people from 22 countries and brings together the current knowledge on the theory and practice of managing botanic gardens so that informed decisions can be made by those involved with botanic garden in all parts of the world. People who work in botanic gardens have very different backgrounds, so each chapter assumes very little knowledge about the subject. This means that botanic garden personnel can be brought up to a the same basic knowledge from which to work.

What were the main problems/difficulties encountered by the project?

Each chapter (eleven chapters) was written by a different person with additional material obtained from questionnaires sent to botanic gardens and extensively reviewed by experts worldwide and subsequently translated by people who have a knowledge of the work of botanic gardens (87 people in 22 countries) is very slow but was essential to ensure the Manual would be truly representative of current best practice in botanic gardens. The main authors and the other contributors already had full-time jobs in botanic gardens and could not do the work quickly. The translations were slow for the same reason, because we had to use native speakers who also belonged to the network of botanic gardens to make sure the correct words and sense were maintained. This is a problem with all technical translations and has been acknowledged by other international agencies such as IPGRI (International Plant Genetic Resources Institute).

What are the key lessons?

What are the key lessons to be drawn from the experience of this project?

The key difficulty is asking colleagues who are already in full-time work to write, edit and review this material. It is essential that this work is carried out by botanic garden personnel. to make sure that it is relevant. This meant that the project took much longer than estimated. Perhaps we should have spread the project over a longer time or been able to offer more remuneration to get the project finished on schedule.

Does the experience of this project imply a need to review arrangements for developing and managing projects funded as part of this Initiative?

No, the contractor can take these lessons into account when writing future proposals.

11. Project Contacts

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'End users' for the output produced by the project in the host country

- Over 500 English copies distributed to botanic gardens in 112 countries. These include members of Botanic Gardens Conservation International (BGCI) (See Botanic Gardens Conservation International (BGCI) Membership Directory 1999).
- Further copies (approx. 300) have been sent on request to key gardens and individuals.
- Spanish copies have been sent to 49 botanic gardens in 16 Spanish-speaking countries. Further copies (42) have been sent to key gardens and individual staff on request.
- French copies will be sent to 33 gardens in 12 French-speaking countries and further copies will be sent to key gardens and individual staff on request.
- Copies will be distributed to participants of all relevant training courses and workshops
- Copies of all language versions will continue to be distributed on request.

Other key players involved in the funding/operation/utilisation of the project.

Coordinating the Portuguese translation of the Darwin Technical Manual for Botanic Gardens:

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