Introduction

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I. SETTING THE SCENE

What started several millennia ago with the desire to domesticate and cultivate wild plant species for sustained provision of food, may have paved the way for the notions of garden and gardening, and the many forms and uses known today associated with these terms. While gardens were established to serve various functions throughout history, whether for contemplation and aesthetics, study and supply of herbal medicine, or cultivation trials of introduced, exotic plant species, this diversity is still well-reflected in the work of a botanic garden today. Rapid, worldwide change, environmental degradation and loss of biodiversity in the 20th and 21st centuries, have further amplified the roles of botanic gardens as major centres for the conservation of plant diversity in *ex situ* collections and environmental education. The multi-functionality of botanic gardens continues to grow in the face of escalating global challenges, in areas such as monitoring climate change, ecological restoration, food security and social inclusion. Likewise, botanic gardens are increasingly aspiring to act as model organisations for sustainability, promoting the use of environmentally friendly construction materials and low carbon, daily operations.

These multiple roles of botanic gardens in society and the environment are well-illustrated by the definition *'A botanic garden is an institution holding documented collections of living plants for the purposes of scientific research, conservation, display and education'* (Wyse Jackson, 1999). While this characterisation does not require an institution to address all these thematic areas, it places living plant collections and their documentation at the centre of a botanic garden. In turn, the types of living plant collections and the nature of the information recorded and managed, will vary according to their functions, be it for research, conservation, education, public outreach, inspiration or recreation.

Defining an institution as a botanic garden based on minimum standards of documentation for collections that serve different purposes however, is subject to ongoing debate and work-in-progress within the botanical community. For instance, this concerns historical institutions with collections whose documentation may have been lost, but whose plants represent unique specimens of a threatened species with universal heritage value. It also relates to institutions with an educational or recreational intention as the primary goal, but with limited details regarding the origin of the plant collection. However, documentation of collections – irrespective of their main purpose – is essential in the context of laws and policy covenants that govern the international exchange of plant material. Comprehensive information on plants held at botanic gardens is a necessity to demonstrate legal compliance with adopted provisions.

II. PURPOSE OF THIS MANUAL

Very few resources exist to this day that offer guidance on botanic garden planning, development and management in a single, comprehensive compendium. Building on BGCI's earlier handbook, The Darwin Technical Manual for Botanic Gardens (Leadlay and Greene, 1998), the present edition aims to maintain its major role in this niche by providing direction and up-to-date information. Since 1998, there have been major changes in biodiversity policy that influence and inform botanic gardens. These are reflected in the 2nd edition of the International Agenda for Botanic Gardens in Conservation published by BGCI in 2012 which serves as a companion volume to this Manual. Of major significance is the Global Strategy for Plant Conservation (GSPC) of the Convention on Biological Diversity (CBD) which acts as the focal, international framework to conserve and maintain plant diversity. The work of botanic gardens worldwide is paramount to achieving the objectives and targets of the GSPC as well as of the Strategic Plan for Biodiversity 2011-2020, including its Aichi Biodiversity Targets – the overarching framework on biodiversity, not only for the biodiversity-related conventions, but for the entire United Nations system and all other partners engaged in biodiversity management and policy development (Box I).

III. TARGET AUDIENCE

This Manual is intended for botanic gardens as ever-evolving institutions that respond to environmental and societal needs, changes and challenges. As a comprehensive resource, the guidance provided aims at an equally inclusive range of stakeholders, including:

- Newly developing or recently established botanic gardens with limited expertise that may use the manual as a source of ideas and guidance for their development;
- Established botanic gardens that may seek the latest information on particular aspects of botanic garden management as part of an ongoing re-development or organisational review;
- Botanic garden staff who may wish to broaden their outlook or see how their role relates to the overall work of botanic gardens; and
- Other environmental and conservation organisations, government agencies, businesses and individuals with an interest in supporting botanic gardens and/or integrated *ex* and *in situ* conservation initiatives.

This Manual is not meant to be prescriptive but to offer guidance and ideas with case studies from around the world. It is hoped that components will be useful in training, reviewing the ongoing work of botanic gardens and helping to raise standards. The internet-based version aims to facilitate a better understanding and visualization of interconnected themes and processes, and allows for regular updates, whilst users also have the option to download a print copy. Interactive, hyperlinked information is provided with extensive references for further information. Key messages are highlighted and illustrations are designed to reinforce important points. Overall, this Manual is intended to offer a globally representative illustration of botanic garden development and management issues, beyond a national or particular thematic focus. Feedback will be invaluable to ensure that the guidance and information provided meets its purpose and evolves over time to better serve the botanic garden community.

Box I The 2020 Objectives and Targets of the Global Strategy for Plant Conservation (with relevant strategic goals and targets under the Strategic Plan for Biodiversity 2011-2020, referred to as 'Aichi Biodiversity Targets')

Objective I: Plant diversity is well understood, documented and recognized.

Target 1: An online flora of all known plants.

Target 2: An assessment of the conservation status of all known plant species, as far as possible, to guide conservation action.

Target 3: Information, research and associated outputs, and methods necessary to implement the strategy developed and shared.

(All targets relevant to Aichi Target T19)

Objective II: Plant diversity is urgently and effectively conserved.

Target 4: At least 15 per cent of each ecological region or vegetation type secured through effective management and/or restoration. (Relevant to Aichi Targets T5, T11, T19)

Target 5: At least 75% per cent of the most important areas for plant diversity of each ecological region protected with effective management in place for conserving plants and their genetic diversity. (Relevant to Aichi Target T11)

Target 6: At least 75 per cent of production lands in each sector managed sustainably, consistent with the conservation of plant diversity. (Relevant to Aichi Target T7)

Target 7: At least 75 per cent of the world's threatened species conserved *in situ*. (Relevant to Aichi Target T12)

Target 8: At least 75 per cent of threatened plant species in *ex situ* collections, preferably in the country of origin, and at least 20 per cent available for recovery and restoration programmes. (Relevant to Aichi Target T12)

Target 9: 70 per cent of the genetic diversity of crops, including their wild relatives and other socio-economically valuable plant species conserved, while respecting, preserving and maintaining associated indigenous and local knowledge. (Relevant to Aichi Target T13)

Target 10: Effective management plans in place to prevent new biological invasions and to manage important areas for plant diversity that are invaded. (Relevant to Aichi Target T9)

Objective III: Plant diversity is used in a sustainable and equitable manner.

Target 11: No species of wild flora endangered by international trade. (Relevant to Aichi Targets T4 and T6)

Target 12: All wild-harvested plant-based products sourced sustainably. (Relevant to Aichi Targets T4 and T6)

Target 13: Indigenous and local knowledge, innovations and practices associated with plant resources, maintained or increased, as appropriate, to support customary use, sustainable livelihoods, local food security and health care. (Relevant to Aichi Target T18)

Objective IV: Education and awareness about plant diversity, its role in sustainable livelihoods and importance to all life on earth is promoted.

Target 14: The importance of plant diversity and the need for its conservation incorporated into communication, educational and public awareness programmes. (Relevant to Aichi Target T1)

Objective V: The capacities and public engagement necessary to implement the Strategy have been developed.

Target 15: The number of trained people working with appropriate facilities sufficient according to national needs, to achieve the targets of this Strategy. (Relevant to Aichi Target T20)

Target 16: Institutions, networks and partnerships for plant conservation established or strengthened at national, regional and international levels to achieve the targets of this Strategy. (Relevant to Aichi Target T17)

IV. BIBLIOGRAPHY AND REFERENCES

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