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roots

Botanic Gardens Conservation International Education Review

April 2005

International agendas

Implications for
botanic garden
education
programmes

From paper to practice -
botanic gardens and the CBD

Projects bridging conventions

Education and wetland conservation

The Global Strategy for Plant
Conservation and you!



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International agendas

botanic gardens take
the law into their own hands



Above:
Seed collecting
for ex-situ
conservation
(Photo: Trustees
RBG Kew)

Editorial - English

Concern about the state of our environment is reflected in the various international conventions and agendas aimed at safeguarding our natural resources. How successful we are, of course, depends on how effectively these conventions are put into practice. Yet when you ask many botanic garden educators which of these conventions are being implemented by them, the response is usually non-committal.

The targets of these conventions are encompassed within the eight Millennium Development Goals (www.un.org/millenniumgoals/), which the member states of the United Nations aim to achieve by 2015. At international level it is well recognised that the MDGs cannot be achieved without education. Botanic gardens need to position themselves centrally in this process.

Editorial - Français

L'inquiétude au sujet de l'état de notre environnement se reflète dans les différentes conventions et agendas internationaux qui visent à sauvegarder nos ressources naturelles. Notre réussite dépendra, bien sûr, de la façon dont nous mettrons concrètement en œuvre ces conventions. Cependant, lorsque l'on demande aux animateurs des jardins botaniques quelle est la convention qu'ils mettent en application, la réponse est en général très évasive et réservée.

Les objectifs de ces conventions sont englobés dans les huit « Millennium Development Goals » (MDGs) (www.un.org/french/millenniumgoals) que les Etats-membres des Nations Unies veulent atteindre en 2015. Au niveau international il est entièrement reconnu que le MDGs ne peut pas être réalisé sans l'éducation. Les jardins botaniques sont extrêmement bien placés pour jouer un rôle central dans ce processus.

Ce numéro de Roots détaille les principales conventions qui touchent les jardins botaniques du point de vue éducatif et examine comment elles peuvent être mises en œuvre. Notre but est de mettre l'accent sur le rôle clef que les services éducatifs des jardins botaniques ont à jouer dans la réalisation des objectifs des différents agendas. Pour aider les jardins botaniques dans ce rôle, nous sommes heureux de vous offrir avec cette revue un exemplaire de notre nouveau CD-Rom « Plantes pour la planète : ressources éducatives pour les jardins botaniques ». Ce disque contient les anciens numéros de Roots, une copie des agendas internationaux clefs pour les

Editorial - Español

Nuestra preocupación por el medio ambiente se refleja en la cantidad de convenciones y agendas internacionales que tienen como meta el cuidar de nuestros recursos naturales. Qué tanto éxito tenemos, depende por supuesto, de esas convenciones y como se llevan a cabo efectivamente en la práctica. Aun cuando se pregunte a muchos educadores en jardines botánicos cuales son esas convenciones y como se están implementado por ellos, la respuesta no es resumida.

Los objetivos de estas convenciones se enmarcan en las 8 'Metas del Desarrollo del Milenio (MDGs) (www.un.org/spanish/millenniumgoals) las que los miembros de estado de las Naciones Unidas planean llevar a cabo antes del año 2015. Es reconocido a un nivel internacional que las MDGs no pueden lograr sus metas sin la educación. Los jardines botánicos son excelentes lugares, además de un punto central para llevar a cabo este proceso.

En este número de Roots se observa como el principio de las convenciones afecta la educación en los jardines botánicos; se examina el como implementarlas. Nuestra meta es hacer énfasis en el papel fundamental que juegan estas instituciones para lograr las metas de varias agendas. Es nuestro propósito el apoyar a los jardines botánicos y nos complace de tal manera que estamos incluyendo una copia de nuestra nueva publicación electrónica, un CD-Rom, 'Plantas para el planeta: Recursos para la educación en jardines botánicos'. El CD-R contiene los números anteriores de Roots, copia de

In this issue of Roots we look at the principle conventions affecting botanic gardens from an educational standpoint and examine how they are being implemented. Our aim is to emphasise the pivotal role botanic garden education has to play in achieving the targets of the various agendas. To support botanic gardens in this role, we are delighted to include in this review a complimentary copy of our new CD-R 'Plants for the Planet: Resource Pack for Botanic Gardens'. The disc contains back issues of Roots, copies of key botanic garden international agendas and education congress proceedings. We hope you find it useful.

Our keynote article comes from Daniella Tilbury (Chair of Sustainable Development) and Susana Calvo (Chair in CEPA Conventions) from the IUCN Commission on Education and Communication. They propose that educators use the UN Decade of Education for Sustainable Development as a framework for implementing the international environmental agendas and the MDG. Daniella and Susana underline the importance of botanic garden education in not only raising awareness about plant ecology or ecosystem management, but empowering people in building skills for making change.

Looking at the specific conventions, Donovan Fullard, Deputy Director for Education at Kirstenbosch National Botanical Garden, South Africa, explains how their education programme works with disadvantaged local communities to resolve environmental problems. In so doing, it aims to contribute to the implementation of the World Heritage Convention. Gail Bromley, Education Development Manager & International Consultant for Biodiversity Education, RBG Kew, UK, describes a ground breaking project in Argentina. The organisation she works with, 'Los Algarrobos', acts as a UN focal point for the Convention to Combat Desertification. The project has involved developing a distance learning course for primary teachers, delivered by radio. The programmes look at local issues and encourage teachers to develop teaching programmes to explain and explore these problems with schoolchildren. Barrie Cooper, International Education Manager of the Royal Society for the Protection of Birds (RSPB), describes the RSPB's

jardins botaniques et les actes des congrès sur l'éducation. Nous espérons qu'il vous sera utile.

Notre article principal est écrit par Daniella Tilbury (Directrice du Développement Durable) et Susana Calvo (Chair in CEPA Conventions) de la Commission sur l'Education et la Communication de l'IUCN. Elles proposent que les animateurs tirent parti de la décennie des Nations Unies sur l'Education pour le Développement Durable comme une trame pour mettre en œuvre les agendas internationaux sur l'environnement et le MDG. Daniella et Susana soulignent l'importance des services éducatifs des jardins botaniques non seulement concernant la sensibilisation du public à l'écologie des plantes et la gestion des écosystèmes, mais aussi en fournissant aux gens les clefs nécessaires afin de les inciter à participer au changement.

Face à ces conventions spécifiques, Donovan Fullard, Directeur pour l'Education au Kirstenbosch National Botanical Garden, en Afrique du Sud explique comment leurs programmes éducatifs intègrent des communautés locales défavorisées afin de résoudre des problèmes environnementaux. Ainsi, ils visent à contribuer à la concrétisation de la Convention sur le Patrimoine Mondial. Gail Bromley, qui est Directrice du Service Développement de l'Education et Consultante Internationale pour l'Education à la Biodiversité à Kew, au Royaume Uni, rapporte le cas d'un projet de restauration de terrain en Argentine. L'organisation avec laquelle elle travaille « Los Algarrobos » est un centre d'intérêt pour les Nations Unies dans le cadre de la Convention sur la lutte Contre la Désertification. Le projet implique de développer des cours de formation à distance pour les professeurs des écoles primaires par l'intermédiaire de la radio. Les cours portent sur des problématiques locales et encouragent les instituteurs à développer des programmes d'enseignement pour expliquer et approfondir ces problèmes avec les élèves. Barrie Cooper, Responsable de l'Education Internationale à la Royal Society for Protection of Birds (RSPB), décrit l'approche de la RSPB pour faire de l'éducation dans les zones humides afin de donner un sens concret à la Convention Ramsar sur les Zones Humides. Il soutient que les zones

las agendas internacionales y congresos o reuniones en educación. Esperamos éste le sea útil.

La idea central de nuestro artículo viene de Daniella Tilbury (Jefa de desarrollo sustentable y Susana Calvo (Chair in CEPA Conventions) de la comisión IUCN en educación y comunicación. Ambas proponen que los educadores usen como marco de trabajo el programa de las Naciones Unidas de 'Una década en la educación para el desarrollo sostenible' para implementar las agendas internacionales del medio ambiente y la MDG. Daniella y Susana subrayan la importancia de los jardines botánicos no solo en la concienciación de la ecología vegetal o manejo del ecosistema, sino también, autorizando a la gente en adquirir la destreza para llevar a cabo estas tareas.

Mirando mas detalladamente a las convenciones específicas, Donovan Fullard, director adjunto de educación en el Jardín Botánico Nacional de Kirstenbosch, Sudáfrica, explica como sus programas educativos trabajan con las comunidades locales con carencias para resolver programas ambientales. Haciendo esto, sus metas son contribuciones a la implementación de la Convención de Patrimonio Mundial.

Gail Bromley, encargada de desarrollo educativo y asesora internacional para la biodiversidad en educación, Kew, Reino Unido, describe un proyecto innovador en la Argentina. 'Los Algarrobos' organización con la que ella trabaja, funciona como un centro de acción de la Convención de Lucha Contra la Desertificación, que forma parte de los programas de las Naciones Unidas. El proyecto consiste en series educativas por la radio; aprendizaje a larga distancia. Los programas se enfocan en asuntos locales y animan a los maestros a desarrollar temas para explicar y explorar los asuntos relevantes con chicos de escuelas. Barrie Cooper, oficial de educación de la Real Sociedad para la Protección de las Aves (RSPB), describe como esta sociedad apoya la Convención Ramsar sobre los Humedales. En su discusión, trata de como los pantanos y los jardines botánicos pueden dar a la gente un punto de inicio importante para comenzar su entendimiento, apoyo y acción en la conservación de la biodiversidad.

approach to education in wetlands to support the Ramsar Convention on Wetlands. He argues that wetlands and botanic gardens can provide an important starting point for people to begin the journey of understanding, support and action for the conservation of biodiversity.

This issue would not be complete without looking at the Convention on Biological Diversity. Because so many of the Convention's articles impact on the work of botanic gardens, we have invited contributors to describe how their gardens' education programmes are implementing particular articles. The short pieces are inspiring. Following this article, Sarah Kneebone, BGCI's Education Officer, looks at a cross-cutting programme of the CBD, the Global Strategy for Plant Conservation. Sarah introduces the GSPC and looks in detail at Target 14, which is specifically concerned with mainstreaming plant-based education. She also argues that education needs to be incorporated in every target of the GSPC and suggests that botanic garden educators need to become more involved in the process. It is fitting to mention here that one of the main architects of the GSPC, Dr Peter Wyse Jackson, stepped down as BGCI's Secretary General in March. Peter, who is now the Director of the National Botanic Gardens, Glasnevin, Ireland, will continue to play a major role in BGCI over the coming years. We also look forward to hearing more about the education programme run at the Gardens.

This issue of Roots demonstrates that botanic gardens can contribute to a wide range of international conventions and agendas. In September 2006, BGCI will be holding its 6th International Congress on Education in Botanic Gardens (see back page). Hosted by the University of Oxford Botanic Garden in collaboration with Kew and BGEN, the congress will provide an opportunity for us to meet and discuss ways in which botanic gardens can contribute to the various conventions and MDGs. Do visit the Congress website and register your interest (www.bgci.org/educationcongress). We warmly invite your participation.

humides et les jardins botaniques peuvent apporter un important point de départ pour le grand public à une compréhension, une aide et une action en faveur de la conservation de la biodiversité.

Ce numéro ne serait pas complet sans un regard sur la Convention sur la Diversité Biologique. Etant donné que de nombreux articles de cette convention ont un impact sur le travail des jardins botaniques nous avons invité des contributeurs à décrire comment les programmes éducatifs de leurs jardins concrétisent certains des articles en particulier. Ces courts compte-rendus prêtent à l'inspiration. A la suite de cet article, Sarah Kneebone, responsable du Service Educatif au BGCI, se penche sur un programme transversal de la CDB : la Stratégie Mondiale pour la Conservation des Plantes. Sarah présente la SMCP et analyse l'Objectif 14, qui est spécifiquement dédié à généraliser l'éducation liée aux plantes. Elle affirme également que l'éducation devrait être intégrée dans chaque objectif de la SMCP et suggère aux animateurs des Jardins Botaniques de s'investir plus dans ce processus. Il vient à propos de signaler ici que l'un des principaux architectes de la SMCP, le Dr Peter Wyse Jackson, quitte son poste de Secrétaire Général du BGCI en mars prochain. Peter, qui est maintenant Directeur du National Botanic Gardens, Glasnevin en Irlande, continuera à jouer un rôle majeur dans le BGCI au cours des années à venir. Nous suivrons aussi avec beaucoup d'intérêt les programmes éducatifs de ce Jardin.

Ce numéro de Roots démontre que les jardins botaniques peuvent contribuer à une grande partie des conventions et agendas internationaux. En septembre 2006, le BGCI organisera le 6ème Congrès International sur l'Education dans les jardins botaniques (voir au dos de la revue). Accueilli par le Jardin Botanique de l'Université d'Oxford en collaboration avec le Jardin Royal de Kew et le BGEN, le congrès sera l'occasion de nous rencontrer et de discuter de la façon dont les Jardins Botaniques peuvent contribuer aux diverses conventions et à la MDGs. Allez visiter le site Internet du congrès et faites-nous part de votre intérêt (www.bgci.org/educationcongress). Nous vous invitons chaleureusement à participer.

Este numero de Roots no hubiera sido completo si dejamos pasar el Convenio sobre la Diversidad Biológica (CBD). Debido a que muchos de los artículos de la esta convención tienen impacto en el trabajo de los jardines botánicos, hemos invitado a colegas a describir como sus jardines y programas de educación implementan particularmente esos artículos. Los cuales sirven de inspiración. Siguiendo esto, Sarah Kneebone, oficial de educación de la BGCI, describe las tareas fundamentales de la CBD, la Estrategia Mundial para la Conservación de Especies Vegetales (la GSPC). Sarah da a conocer la GSPC y mira en detalle el objetivo numero 14, que está específicamente relacionado con la corriente central, educación con las 'plantas-como base'. Ella pone en tela de juicio como la educación necesita incorporarse en cada uno de los objetivos de la GSPC y propone que los educadores de los jardines botánicos necesitan estar mas involucrados en este proceso.

Cabe mencionar que en marzo, uno de los principales arquitectos de la GSPC, el Dr. Peter Wyse Jackson, dejo su puesto como secretario general de la BGCI. Peter, es ahora director del Jardín Nacional, Glasnevin, en Irlanda, él continuara colaborando con funciones clave para la BGCI durante algunos años mas. También esperamos con emoción el conocer mas acerca de los programas educativos que se llevan a cabo en ese jardín.

En este numero de Roots se muestra como los jardines botánicos pueden contribuir a un amplio rango de convenciones y agendas. En septiembre 2006, la BGCI llevara a cabo el 6º Congreso Internacional en Educación en Jardines Botánicos (léase la contraportada). La sede es el Jardín Botánico de la Universidad de Oxford en colaboración con Kew y BGEN, este congreso nos dará la oportunidad de reunirnos y discutir en que forma los jardines botánicos pueden contribuir mas con las varias convenciones y la misma MDGs. Le pedimos a usted e invitamos cordialmente visite nuestra pagina electrónica y registre su interés particular (www.bgci.org/educationcongress).

International agendas

implications for botanic garden education

An international platform

The years 2005-2014 have been declared the UN Decade of Education for Sustainable Development. The Decade's International Implementation Scheme (UNESCO, 2004) asks educators to link international agendas such as the environment conventions, Education for All and the Millennium Development Goals, through education (Pigozzi, 2003).

Education for Sustainable Development provides not just a perfect platform for working with a range of international agendas but also an opportunity to find synergies between groups of people who have been working towards the same goal under different labels. Often many educators get caught up with debates about whether their work should be identified as 'Environmental Communication', 'Environmental Education' or 'Education for Sustainable Development'. The Decade provides a space for educators, including those involved in botanic gardens, to go beyond terminology differences and to concern themselves with how their work contributes to addressing local needs in the context of international goals. The driving force behind Education for Sustainable Development was the international community. Unlike most education movements, ESD did not begin with the education community. Its main thrust came from international political and economic forums, such as the UN and the OECD, with IUCN playing an

Summary The international community has been the driving force behind Education for Sustainable Development. Unlike most education movements, Education for Sustainable Development did not begin with the education community. Its main thrust came from international political and economic forums, such as the UN and the Organisation for Economic Co-operation and Development (OECD), with IUCN playing an important role in mainstreaming it as an agenda for the environmental community.

Education for Sustainable Development provides the means by which we engage people in a more sustainable future. It provides a framework to assist with meeting commitments set out in the international conventions on biological diversity, climate change, desertification, cultural and natural heritage, CITES and Ramsar. Furthermore, many of these conventions are committed to work programmes on Communication, Education Participation and Awareness - more commonly referred to as CEPA.

Many working in botanic gardens are familiar with Communication, Education, Participation and Awareness but the concept of linking it with Education for Sustainable Development is a new challenge. This paper explores the implications of this, particularly in the context of a UN Decade in Education for Sustainable Development which asks educators to link international agendas such as the environment conventions and the Millennium Development Goals, through education.

important role in mainstreaming it as an agenda for the environmental community.

Although the concept of 'sustainable development' dates back to the 1980s, it was not until 1992 that Education for Sustainable Development began to emerge as a concept. It owes much to

Chapter 36 of Agenda 21 and the work of the Commission for Sustainable Development (CSD) Work Programme, both of which gave credibility to Education for Sustainable Development as a process. The OECD's efforts and its focus on sustainable consumption over the past decade has been a constant reminder that Education for



Above: IUCN publications support practitioners (Photo: IUCN)

Sustainable Development is more about social change than about environmental protection.

More recently, IUCN, through its Commission on Education and Communication (CEC), has been mainstreaming the concept of Education for Sustainable Development, particularly in the lead up to the Johannesburg World Summit. It lobbied at the Bali and New York PrepComs and encouraged its membership to seek national support for the Decade's proposals presented at the Summit. Simultaneously, IUCN has invited an internet dialogue on Education for Sustainable Development bringing practitioners and experts together to further define thinking and practice in this field (Hesselink et al, 2000). It has also produced a number of publications relevant to practitioners concerned with issues from plant conservation to cultural and natural heritage concerns to health and environmental sustainability (Tilbury et al, 2002, Tilbury and Wortman, 2004)). These publications support practitioners through clarifying concepts, identifying good practice studies and communicating complex thinking, all of which underpin Education for Sustainable Development.

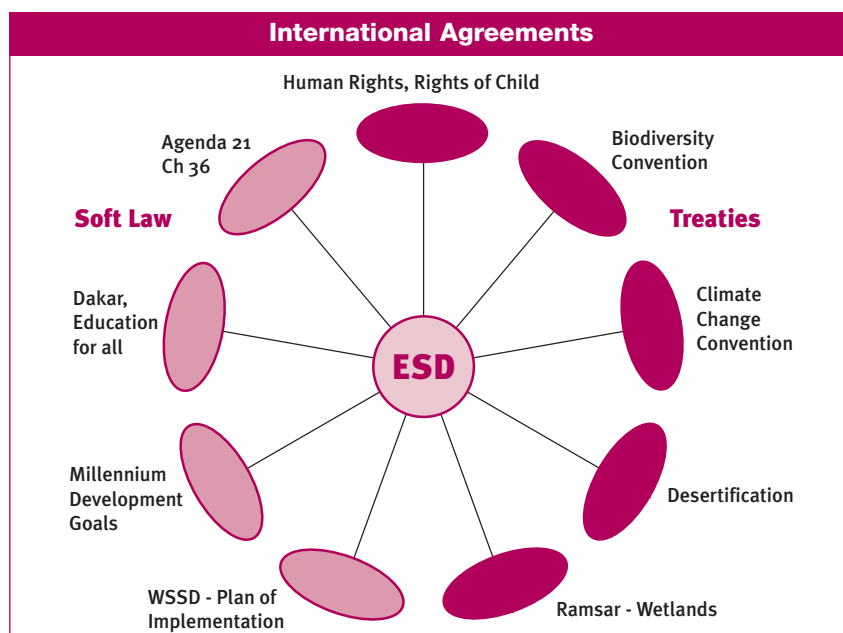
IUCN has also championed the need to find common ground between the international agendas. It has worked closely with the Secretariat of the Convention of Biological Diversity to ensure that education goes beyond awareness-raising and addresses important components often associated with Education for Sustainable Development including capacity building.

A common agenda

Education for Sustainable Development provides the means by which we engage people in a more sustainable future. It provides a framework to assist with meeting commitments set out in the international conventions on biological diversity, climate change, desertification, cultural and natural heritage, CITES and Ramsar. Furthermore, many of these conventions are committed to work programmes on Communication, Education Participation and Awareness - more commonly referred to as CEPA.

It was the Johannesburg Implementation Plan which highlighted the role that effective CEPA could play in meeting the Convention obligations signed off at Rio. The Rio Conventions - Climate, Desertification and Biological Diversity - all have articles pointing to the need for education. Underpinning these documents is an implicit recognition that sustainable development is a social issue to be fought and won through peoples' participation.

However, in practice, education was not seen as a priority by those implementing the Conventions. It has only been recently that the conventions have begun to address articles on education. The Parties to the Convention on Biological Diversity approved a work programme on CEPA



in April 2002 to address commitments in Article 13. The parties to the Convention on Climate Change are still discussing the development of a work programme for Article 6 on education and training. Of course, many parties are undertaking communication and education about these issues, but the trend has been to focus on the more technical aspects of the conventions. In contrast, the Desertification Convention has embarked on a 'bottom-up approach' to involve people in seeking solutions. Other international agreements on cultural and natural heritage, CITES and Ramsar also recognize the role of education and training in change for a more sustainable world. However, interestingly, no bridges have been built between those involved to ensure that experiences and lessons learnt in education across these issues are shared. Without this learning, it is often difficult to advance education efforts or indeed to attain environmental or sustainable development impacts.

Educators in botanic gardens

Many working in botanic gardens are familiar with CEPA but the concept of linking it with Education for Sustainable Development is a new challenge. The UN Decade of Education for Sustainable Development asks educators to link international agendas such as the environment conventions and the Millennium Development Goals, through education. It asks educators to recognize that moving towards sustainability will require changing the way we think, live and work (UNESCO, 2002), not just our understanding of the issues. The emphasis of the Decade is not only on strengthening knowledge in sustainable development across stakeholder groups but also on challenging mental models that lead us to unsustainability.

Many education programmes undertaken in botanic gardens need redefining. They can no longer afford to be confined to educating people about ecology – social realities and consumer choices need to be embedded within such programs. Raising awareness among adults and children about plant ecology or ecosystem management is only one part of the equation. Learning

to change and assisting others to build skills for making change is also a core responsibility of educators working in botanical gardens.

There are key features associated with the Education for Sustainable Development process which encourages people to explore the complexity of these areas and consider change. The literature (Huckle and Sterling, 1997, Tilbury and Wortman, 2004) argues that learning for change requires:

- a focus on the **future** and ability to create a sustainable futures – more than just focusing on problem-solving our way out of our current situation
- less emphasis on science and technology solutions and more on **participatory and citizen action**
- less emphasis on seeing people as the problem to seeing **people as agents of change**
- less emphasis on awareness-raising approaches and **more emphasis on critical reflection, systemic thinking and values clarification approaches**
- a focus on **individuals influencing structural change** – not just on individual environmental actions
- more focus on changing mental models that influence decisions and actions rather than solely changing individual attitudes.

The aim of Education for Sustainable Development is to empower citizens to act for positive change. This implies a process-oriented, participatory and action oriented learning approach. This approach has implications not only for what we learn but also how we learn.

Finally...

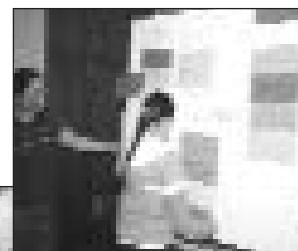
UNESCO emphasizes that the effectiveness of the Decade will ultimately be judged not just by the degree of change in the lives of

communities and individuals at the local level, but the changing patterns of development and progress towards more sustainable models of living.

Eleven outcomes are expected from the UN Decade as outlined in the International Implementation Scheme. These outcomes, although stated in broad terms in the plan, should guide the basis of indicators for monitoring and evaluating progress during the Decade. Some of the indicators are:

- a) integration of education into sustainable development strategies and plans of action
- b) cooperation and a growing consensus on the strategic importance of ESD as a tool for social change
- c) broad understanding of the nature and principles of sustainable development and regular media coverage of the issues
- d) ESD-specific approaches increasingly adopted in learning situations of all kinds
- e) ESD as a core component of training of educators at levels.

National activities are planned in many countries (visit <http://portal.unesco.org/education> for more information). The UN Decade of Education for Sustainable Development will offer further opportunities for those working in botanic gardens to reflect on, share experiences of and learn about the implications of sustainable development for their work. The Decade provides not just a platform for combining agendas but



Above and left: ESD is a process that encourages people to explore complex issues (Photos: Daniella Tilbury)

also a direction for assuring that the type of work we undertake does contribute to change (and not just understanding) for a better world.

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Résumé

La communauté internationale a été la force motrice accompagnant le concept d'Éducation au Développement Durable (EDD). Contrairement à la plupart des mouvements d'éducation, l'EDD n'a pas vu le jour aux côtés des organismes traitant d'éducation. Ses principales avancées proviennent des forums politiques et économiques internationaux, tels que ceux organisés par les Nations Unies et l'OCDE, ainsi que l'IUCN qui a joué un rôle important notamment pour maintenir son courant d'idées sous la forme d'agenda pour la communauté environnementale.

L'ESD nous fournit une méthode pour engager les gens sur la voie d'un futur plus durable. Elle apporte aussi la trame nécessaire pour nous aider à réaliser les engagements communs dressés dans le cadre des conventions internationales sur la diversité



biologique, le changement climatique, la désertification, le patrimoine culturel et naturel ainsi que les conventions CITES et Ramsar. Par ailleurs, chacune de ces conventions comporte un volet portant sur la mise en place de programmes de communication, d'éducation, de participation et de sensibilisation du public, plus communément appelés CEPS.

De nombreux acteurs des jardins botaniques sont familiers de la CEPS, mais l'idée de la lier avec l'ESD représente un nouveau challenge. Cet article explore les implications de ce nouveau défi, particulièrement dans le contexte de la Décennie des Nations Unies pour le Développement Durable comprenant une participation attendue des animateurs pour effectuer le lien entre les agendas Internationaux tel que les conventions sur l'environnement et les Objectifs de Développement du Millénaire par le biais de l'éducation.

Resumen

La comunidad internacional ha sido la fuerza fundamental para llevar a cabo la educación para el desarrollo sustentable (ESD). Distinta a la mayoría de los movimientos educativos ESD no comenzó con la educación comunitaria. Sino su origen fue los foros políticos y económicos internacionales, como son los de las Naciones Unidas (ONU) y la OECD, que junto con la IUCN tuvieron un papel muy importante en este movimiento a manera de una agenda para la comunidad medioambiental.

ESD proporciona los medios para atraer gente a un futuro más sostenible. Asimismo proporciona un marco de

trabajo para organizar por medio de reuniones los compromisos internacionales como la convención de diversidad biológica, cambio climático, desertificación, patrimonios cultural y natural, CITES y Ramsar. Además, cada una de estas convenciones están comprometidos a trabajar con un programa de comunicación, concienciación y participación en la educación – comúnmente llamada CEPA.

Numerosos trabajadores en los Jardines Botánicos conocen CEPA, sin embargo, el concepto de ligar CEPA con ESD es un nuevo reto. Este artículo explora las implicaciones de este objetivo, particularmente en el contexto de las NU una Década en Educación para el Desarrollo Sostenible, el cual pregunta a los educadores el conectar las agendas internacionales como son la del medio ambiente y su desarrollo de metas en el milenio, a través de la educación.

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From paper to practice

botanic gardens and the Convention on Biological Diversity

Botanic gardens education: A strategic vehicle for the implementation of the Convention on Biological Diversity

The 1992 United Nations Conference on Environment and Development in Rio de Janeiro, Brazil, emphasized the inextricable link between the environment and development, and focused on forging international agreements that promote development while respecting the interests of all human communities and protecting the integrity of the global environment. Key outcomes of the Conference included three international environmental agreements that define specific government commitments to biodiversity, climate change, and desertification. These agreements, while seemingly technical in nature and vast in scope, offer important guidance for our work as botanic garden educators.

One of these agreements, the Convention on Biological Diversity (CBD), has since been ratified by 188 countries. The CBD is guided by the ecosystem approach and has three key objectives: the conservation of biological diversity, sustainable use of its components, and fair and equitable sharing of benefits arising out of the utilisation of genetic resources. Implementation of the CBD is governed by the Conference of Parties (COP), which defines priority actions and provides guidance to participating

nations. To date, the CBD has developed priority work programmes based on broad themes, including Forest Biodiversity; Biodiversity of Inland Waters; Marine and Coastal Biodiversity; Agricultural Biodiversity; Mountain Biodiversity; and Protected Areas. A thematic programme focusing on Islands is also being developed. In addition, cross-cutting programmes address issues such as Biosafety (which has resulted in the negotiation of the Cartagena Protocol on Biosafety); Access to Genetic Resources and Benefit Sharing; Traditional Knowledge, Innovation and Practices (Article 8j); Education and Public Awareness; Sustainable Tourism; the Global Taxonomy Initiative; Invasive Alien Species; and the Global Strategy for Plant Conservation (GSPC).

Gardens are well placed to lead the call for national implementation of the GSPC and relevant CBD work programmes. Thus, new challenges and responsibilities for botanic garden educators arise out of these agreements: How do botanic gardens develop locally relevant programmes that respond to the challenge of poverty alleviation and sustainable development? How do we promote of the role of indigenous knowledge and technologies in scientific research and education? How do botanic gardens promote a holistic approach to plant conservation, including community-based initiatives to enhance sustainable use? How do our

programmes respond to the emerging call to balance the focus on ecosystem and species conservation? How do we build bridges between pure sciences and user needs and economic development? How do botanic gardens contribute to other international targets such as those articulated by the Millennium Development Goals, the World Summit on Sustainable Development and the 2010 Biodiversity Goal. Indeed, to achieve the targets of the GSPC requires a candid review of these questions, among others, and the authors in this issue of *Roots* explore some of these ideas through case studies and reflections on practice.

The Third Principle of the Rio Declaration on Environment and Development (1992) states that the right to development must be fulfilled so as to equitably meet the development and environment needs of both present and future generations. We must work to innovatively promote these goals in response to the local needs and aspirations of the communities where our gardens are located, and within the context of the issues highlighted above, so as to effectively safeguard the earth's biodiversity for generations to come.

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Right:
Participants on
the temazcal
medicinal plants
programme,
Mexico
(Photo: Edelmira
Linares)

Article 7 – Identification and Monitoring

Medicinal plants and the pre-Hispanic Mexican steam bath

Botanic garden educators and researchers pursuing ethnobotanical and floristic studies have a unique opportunity to strengthen local communities and meet the objectives of the Convention on Biological Diversity by creating programmes that explore the cultural uses of plants. At the Botanical Garden of the Institute of Biology of the Autonomous National University of Mexico, a three-phase program is underway in the region of Ozumba, State of Mexico, to teach local community members about the use of medicinal plants in traditional ritual and healing practices.

On average, 80 plant species with medicinal properties are sold in Ozumba and shipped to Mexico City's Mercado Sonora, Mexico's largest market of plant-based remedies. In rural central Mexico, a pre-Hispanic steam bath called 'temazcal' uses some of these herbs for therapeutic and ritual purposes. Water is infused with medicinal plants and poured over heated stones to create steam. This practice has been abandoned in urban areas due to increasingly busy lifestyles and lack of space. However, with the rise of ecotourism programmes that incorporate

traditional cultural practices, the temazcal is attracting the interest of native communities and undergoing a revival.

In 2004 as part of the first phase of this new education program, the Botanical Garden offered three two-day workshops on temazcal medicinal plants in association with Centro Botánico Ameyali, a regional NGO dedicated to the promotion of medicinal plants.

On the first day of the workshop, different styles of Mexican temazcales were reviewed with respect to the type of construction and the medicinal plants employed. For each plant species, the following features were highlighted: taxonomy, ethnobotany, and collecting and processing the plants. Students made observations of living plants in the Botanical Garden's medicinal plants section. They also made a set of herbarium specimens from the plants and noted important characteristics to aid in their identification. All of the materials and information were incorporated into a manual so that more material could be added and so that the manual could be used as reference guide in the future.

During day two, participants travelled to the partner site, the Centro Botánico Ameyali, in the Ozumba region for a first-hand introduction to two styles of sweat baths. They participated in the



ritual cleansing using local herbs under the guidance of expert 'temazcaleros', which means 'guide' or 'healer'.

The participants included medical doctors, psychologists, massage therapists, acupuncturists, housewives, retired teachers, biologists, engineers, veterinarians, broadcasters, dancers, and accountants, as well as novice 'temazcaleros'. In follow-up questionnaires to each workshop, participants responded that they took the workshop in order to increase their botanical knowledge, to explore their cultural heritage, and to enhance personal spiritual well-being.

The second phase of the education program will begin this year and will target local farmers and plant collectors. This phase will include a similarly structured workshop focusing on taxonomic and ethnobotanical aspects of the cultivated 'temazcal' plants in the region. The third phase of the program will target teachers and students at local schools in order to promote biological and cultural conservation in the region.

The three main objectives of the CBD are conserving biological diversity, using biological resources sustainably, and sharing the benefits arising from the use of genetic resources fairly and equitably. This botanic garden education program works to meet these objectives by generating local interest in traditional uses of plants and their conservation.

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Right: Medicinal
plants being
studied by
students for
their identifying
features
(Photo: Edelmira
Linares)



Article 8 In-Situ conservation

The Kanha National Park Interpretation Programme

The Central Indian Highlands boast some of India's least disturbed forests, of which Kanha National Park in its pristine beauty is a wonderful example. The alarm call of a sambar deer filling the valley, the setting of the sun, and the coming alive of the mighty tiger on its prowl can all be experienced in the wilderness of Kanha. The Park is home to innumerable creatures big and small and has a rich plant diversity. Kanha was also declared a tiger reserve in 1973 under the Indian government's Project Tiger.

So what can be done to help visitors experience the excitement of the Park, understand and contextualize what they see, and go back with a deepened sense of appreciation and concern for the forests and its inhabitants?

With the professional support of the U.S. National Park Service (USNPS), The Centre for Environment Education (CEE) in Ahmedabad, began India's first interpretive programme in 1984 with the design and development of the Kanha National Park Interpretation Programme.

To develop the programme components, a message-media matrix was developed to determine the most effective and appropriate media for different messages and themes, constantly keeping in mind the diverse visitors that come to the National Park. Visitor profile surveys were also conducted.

The resulting interpretive programme plan included the following indoor and outdoor components:

- nature interpretation centres to orient and enhance visitor experiences
- informative directional signage
- wayside exhibits at significant locations interpreting interesting ecological interrelationships and fascinating aspects of nature
- a variety of publications that give an overview of Kanha's landscape, weather, fauna and interesting wildlife

A significant feature of the Kanha interpretive programme was the landmark decision that the entire programme would be run as a co-operative formed by staff and locals/tribals, who were moved out of the core area to facilitate the formation of the Park. They, along with other low-income groups, serve the park as elephant mahouts, Jeep drivers, and guides.

The Kanha programme was installed in 1991 and has won appreciation from visitors and professionals alike. In 2003, CEE and the Madhya Pradesh Forest Department began a project to update and add to the existing interpretive facilities and programme.

Orientation Centre

The Orientation Centre is located at the one of the entry points to the Park. Existing guest rooms were converted into the Orientation Centre, and care was taken to see that the building blends well with the natural environment. The main aim of the Orientation Centre is to draw visitors' attention to the different forms in nature and to show how intimately form is related to function. Subjects include horns and antlers; nails, claws and paws; and teeth and jaws. There are also exhibits focusing on mimicry and camouflage.

Visitor Interpretation Centre

Also located within the Park, the Visitor Interpretation Centre introduces the Park's geography, flora and fauna. Interactive and participatory media provide detailed information about the Park, ecological concepts and conservation issues.

A great deal of research has taken place at Kanha, and many exhibits in the Visitor Interpretation Centre are dedicated to those individuals who have contributed to our understanding of the Indian wild. The aim has been to demystify and make this research interesting. For instance, in the exhibit 'Census of the Wild,' the visitor tries to match pugmarks of a tiger only to realise that just like our finger prints, no two pugmarks are the same. Conservation messages are also addressed, and a dioramic display with

sound and a large mural illustrates how the tiger was saved from the brink of extinction.

Signage

Within the Park, signs provide on-site interpretation of fascinating aspects in nature and the ecological interrelationships that visitors will encounter as they drive through the Park. For instance, visitors will likely see termite mounds whilst driving through the Park. An interpretive sign shows how termites turn decaying vegetation into soil and how the sloth bear keeps the termite population in check by feeding on them. Interpretive signs also convey conservation messages.

Publications

A variety of publications for diverse audiences have been developed for Park visitors. These are published in both English and the local language. Park folders, brochures, handbooks, pocket cards, roadside guides, posters and chronicles with interesting and exciting information have been designed and developed for all visitor types. A sales counter displays the Park's publications as well as souvenirs and a site map carved out of wood shows all the important features of the Park.

As India's first interpretive programme, the Kanha Programme not only sets standards, but also provides valuable insights and lessons for future interpretive programmes. It is an excellent example of how education can help meet *in situ* conservation goals of the Convention on Biological Diversity.

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Below and right:
Scientists
collecting seeds
for the MSB
(Photo: Trustees
RBG Kew)



Article 9 – Ex-situ conservation

Millennium Seed Bank Project, Royal Botanic Gardens Kew, Wakehurst Place. Introducing *ex situ* conservation through environmental education

Right:
Providing first
hand experience
helps to
communicate
the importance
of *ex situ*
conservation
(Photo: Trustees
RBG Kew)

In August 2000, the Royal Botanic Gardens Kew opened the doors of the Millennium Seed Bank Project (MSBP) at Wakehurst Place, West Sussex, U.K. This represented an opportunity to bring visitors into the centre of an internationally significant *ex situ* conservation project and to demonstrate the importance of *ex situ*

conservation within the Convention on Biological Diversity. At the project, huge windows offer visitors unobstructed views of seed processing for banking and research into seed storage and viability. Students who visit can see young men and women scientists in action as role models and may be inspired to pursue careers in plant conservation.

For schools, we begin by introducing ‘discovery boxes.’ The goal is to teach children about the importance of plants. Young children explore boxes containing artifacts that link plants to their own experience. One box contains sniff pots of smelly seeds for children to try and identify the smell. The answers include perfume, ice cream, medicine and food. We also use an activity called ‘Imagine a World Without Plants’ which illustrates a typical family kitchen in the U.K. Through group discussion, they see how plants underpin all parts of our everyday existence.

Outside we use our UK habitat parterres to link biodiversity with school science, focusing on adaptation. First, we look at how humans protect themselves in the environment and then dispatch students to look for plants that use similar methods. By establishing the wow and wonder of plants we prepare students for understanding the role of the MSBP.

Older students come to Wakehurst Place wanting to know more about *ex situ* conservation. Tours of the Project include introductions to why and where plant species are under threat, seed banks as part of plant conservation strategies, and how the MSBP works. The visit finishes by focusing on the students. We want them to leave understanding the role of *ex situ* conservation and feeling empowered to take action themselves. One exercise is based on a barbecue. Students start by asking questions: Where does the charcoal come from? How is it harvested? Is the food from local sources or imported? How do our purchases affect the livelihoods of our communities and those in other countries? By examining these questions, students leave knowing that their choices make a difference.

For those unable to visit, last year the MSBP launched a web-based interactive programme in seed conservation leading to a vocational qualification (BTEC).

As we design future education projects at the MSBP, we will constantly try to reach new audiences. Last autumn we celebrated seeds through an event called the Big Draw. The exhibition room became the venue for both artists and scientists working together with the public creating drawings on glass. The artists helped visitors to draw, and the scientists told stories about the collections. Drawn to this blending of art and nature, 1700 people visited the Project that day!





Botanic gardens are leaders in *ex situ* conservation of plant species from around the world, and as such we are working to meet the goals of the CBD. Our education programs should communicate to visitors the importance of *ex situ* conservation in saving plants.

For more information on the Millennium Seed Bank Project, visit www.kew.org.

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Article 10 – Sustainable use of components of biological diversity

Home garden project, NBRI, Lucknow

Over the last decade or so in India and in many other parts of the world, it has become widely accepted that the deterioration of the natural environment has a direct impact on women's lives. The nutritional security of many rural women, for example, has been seriously affected by explosive population growth. Whenever the prospects of food shortage have become acute in the past, people have looked to non-traditional plants that can serve as alternative food sources.

With this in mind, the Eco-education Division of the National Botanical Research Institute (NBRI) in Lucknow, is trying to empower the rural population in India to manage the nutritional status and primary healthcare of their families. Particular attention has been paid to women in the home and women from less privileged classes (particular castes and tribes). The Division also teaches people how to use locally available bio-resources in a proper and sustainable manner.

Home gardens

The Eco-education Division has set up a project to develop home gardens in Amol Kalla Paschim, a village about 23 kilometres outside Lucknow. More than 1700 people in 150 households live in the village. The purpose of the project is to enhance the nutritional and economic status of the villagers. This village was chosen because of the enormous population of poor and undernourished inhabitants.



The objectives of the project are:

- to identify bodies of water in the village
- to organise a self-help group for women
- to educate villagers about how to cultivate seasonal vegetables
- to identify lesser-known but locally available plants of nutritional and medicinal value

The project was implemented in two phases.

The aims of phase one were:

- to develop a demographic profile of the village
- to clean up the village water
- to liaise with villagers
- to eradicate weeds from identified ponds and small patches of land suitable for gardening

Phase two focused on setting up training programmes to teach women about the cultivation of crops such as coriander, onion, bottle guard and pumpkin. The procedure was as follows:

Left: school children at the MSB are given plenty of opportunity to explore the links between plants and their lives (Photo: Trustees RBG Kew)

Above: Experts delivered a series of interactive lectures (Photo: Kamla Kulshreshtha)

Left: People participating in The Big Draw, an event which attracted 1700 people in one day (Photo: Trustees RBG Kew)

Right:
The home
garden project
educated
villagers about
cultivating
seasonal
vegetables
(Photo: Kamla
Kulshreshtha)

1. Scientists from the National Botanical Research Institute visited the village several times in order to:
 - identify key resource persons who could ensure the smooth running of the programme
 - assess the bio-resources utilization pattern (food, fodder and fuel)
 - develop a demographic profile of the village
 - assess the nutritional status and social practices of the villagers
 - gather baseline information about the basic facilities such as health care and education available in the locality

Below:
Cleaning up the
village water –
phase one of
the project
(Photo: Kamla
Kulshreshtha)

2. On the basis of the scientists' findings, an awareness campaign was organised, followed by several training programmes.. During the first awareness programme, 25 women's Self-Help Groups (SHGs) were formed. Each group had five or six women representatives.

Below right:
Dr Kamla
Kulshreshtha,
Head of Eco-
education
Division (2nd
adult from left)
with one of the
women's self
help groups
(Photo: Kamla
Kulshreshtha)

3. Each SHG was provided with an educational kit. Each kit contained small booklets on the nutritional importance of vegetables; a vegetable calendar; seeds of locally grown vegetables such as spinach, carrot, potato, pumpkin, and bottle guard; and stationery items such as pencil, pen, notepad and eraser. The resource materials were published in both Hindi and English.



4. SHGs were encouraged to visit the Eco-education Division's model home garden and herbal garden.
5. Experts delivered a series of interactive lectures in the local language, as well as field demonstrations on pit composting, vermi-composting, sowing of seeds, and identification of medicinal plants.
6. Volunteers helped to motivate the men of the village to come forward to help their wives in agri-practices.

Feedback was collected following one year of the project. The 25 SHGs had

developed model home gardens with the help of the materials given to them. They consumed some of the vegetables and sold some of them. They harvested seeds for further sowing. Five groups developed home gardens and also gardens for primary health care. The remaining groups cultivated aquatic crops, especially *Trapa bispinosa*. The crops produced a wonderful harvest and each member of the five SHGs earned 1800 rupees. This was in addition to whatever they had used for their own consumption. The programme was very successful, and the Division is looking to expand this programme to nearby villages. The Indian government's Department of Science & Technology gave financial support to the entire programme.

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Article 12 – Research and training

Education in support of the CBD Article 12

Educators at botanic gardens actively support Article 12 (Research and Training) of the Convention on Biological Diversity by promoting conservation research, interpreting research results for the wider public, and offering both technical and non-technical training related to plant conservation.

Research

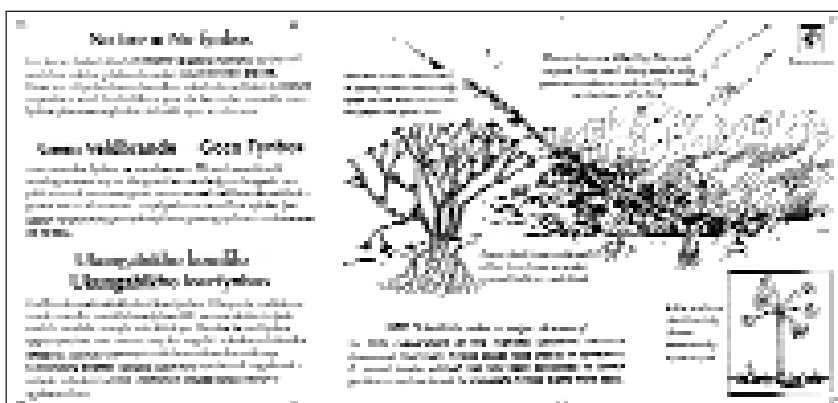
Botanic gardens undertake research in many areas that support the CBD, most importantly plant taxonomy and horticulture. Both of these research areas are essential for conservation and achieving the targets outlined in the Global Strategy for Plant Conservation.

Botanic gardens disseminate the results of their taxonomic research through published Floras, monographs, field guides, and guides on specific plant groups (medicinal, trees or ornamental, for example). These are usually for sale in botanic garden bookshops. More recently, botanic gardens have produced searchable databases on CD-ROMs or websites such as the *International Plant Names Index*, a database of the names and associated basic bibliographical details of all seed plants (www.ipni.org). Other database projects include the Missouri Botanical Garden's (U.S.A.) nomenclatural database and associated images, *VAST (Vascular Tropicos)* (<http://mobot.mobot.org/W3T/Search/vast.html>), and the *New York Botanical Garden Living Collections Database* (U.S.A.) (www.nybg.org/bsci/searchlc.html).

Horticultural research is necessary for habitat restoration and to develop propagation and cultivation methods for plants that have not been in cultivation. For example, The Botanic Gardens Trust, Royal Botanic Gardens and Domain in Sydney, Australia, have developed a useful website focused on its research into the taxonomy, ecology and horticultural development of the Wollemi pine (*Wollemia nobilis*)



Top: Brochure on the use of smoke for germination (Photo: Kings Park and Botanic Gardens, Australia)



Above: Storyboard on the use of fire in regenerating fynbos (Photo: South African National Biodiversity Institute)

(http://www.rbgsyd.gov.au/information_about_plants/wollemi_pine). The Wollemi pine is a recently discovered tree from an evolutionary line thought to be extinct. Young specimens are grown in several Australian gardens with interpretive panels describing research on the taxon.

Botanic gardens often educate the public about research through interpretation. Kings Park and Botanic Garden, Perth, Australia, for example has produced a brochure and poster on the use of smoke for germination. The South African National Biodiversity Institute (formerly National Botanical Institute) produced a story board on the use of fire in regenerating fynbos (see images above).

Training

Botanic gardens organise training for both internal and external audiences. Training in botanic garden management, horticulture, plant record

keeping, taxonomy and herbarium techniques, for example, build capacity for botanic gardens to undertake conservation. Additionally, botanic gardens organise training courses for garden staff in environmental education, as well as for local communities in plant identification and plant conservation techniques, all of which directly support implementation of the CBD.

Botanic gardens provide a unique resource for plant identification courses as they have libraries, hold documented collections of living plants and often have practicing taxonomists on the staff. For example, at the Cambridge University Botanic Garden, U.K., systematic flower beds representing nearly 100 plant families provide a valuable teaching and research resource. Also the Jardín Botánico del Instituto de Biología in Mexico uses its collection of labelled medicinal herbs, a book and a CD-Rom on medicinal plants as part of its

training courses for traditional healers, midwives and pharmaceutical researchers. The University of Genoa Botanic Garden, Italy, organises practical workshops for the identification of wild edible plants (known as *Preboggion*), one of the most important elements in the regional cuisine and sometimes medicine, while the Royal Botanic Gardens, Kew, U.K., provides training for customs officials and police officers in basic taxonomy for enforcement of the Convention on International Trade in Endangered Species (CITES).

Botanic gardens also organise national and international courses on plant conservation techniques and environmental education (e.g. Royal Botanic Gardens, Kew, and Denver Botanic Garden, U.S.A.) to build capacity for conservation. The Royal Botanic Gardens, Kew, has also published a training tool, *The CBD for Botanists*, in English, French and Spanish on the implementation of the CBD.

Programmes such as these at botanic gardens worldwide demonstrate how garden educators can be actively involved in meeting Article 12 of the CBD.

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Article 13 – Public education and awareness

Environmental education at the Forest of Learning, Kuala Lumpur

Rimba Ilmu ('Forest of Learning' in Malaysia's national language) is the 80-hectare botanic garden of the University of Malaya, founded in 1974. It is located within the sprawling university campus southwest of Kuala Lumpur, Malaysia. Rimba Ilmu Botanic Garden has labelled collections for visitors; its own building with a 70-seat lecture hall; and a permanent exhibition, *Rain Forests and Our Environment*, a large and comprehensive interpretive facility for understanding biodiversity and the role of rain forests in environmental well-being.

A small complement of staff, headed by two academic staff members and assisted by a science officer and a small team of ground staff, manages the botanic garden. In addition to its regular operating hours, a special guided tour for the public is arranged on the first Saturday of every month. Excluding students from the University, between 7,000 and 8,000 people visit the botanic garden each year. Education programmes at Rimba Ilmu fall into two categories: informal visits and exhibits for the general public; and special programmes for groups. Group programmes target the University's 30,000 students, as well as other schools and colleges. These programmes are one of the main components of Rimba Ilmu's efforts to promote awareness in nature and conservation among schools and the general public, and create further opportunities and encourage linkages to enhance education and environmental awareness.

The Rimba Ilmu mission statement and philosophy of environmental education

The Rimba Ilmu Environmental Education Programme seeks to promote environmental awareness and an understanding of the relationship between people and nature through experiences that encourage personal discovery and group interaction, and respect for the natural environment.

Education programmes focus on the interactions between the main components of our planet's physical, biological and cultural environment. Skills cultivated in programmes include exploring our environment and gathering information; noticing similarities and differences; describing and recording information and ideas; interpreting the environment, its components and processes from different perspectives; and problem-solving (making decisions on the best courses of action).

Values considered appropriate and thus encouraged include a desire for a healthy environment; care and respect for the natural world; consciousness of the vulnerability of the environment; recognition that collective good sense

is necessary for maintaining a healthy environment; readiness to adapt to options that assure a safer and better natural environment; and appreciation of the role of increasing knowledge toward better environmental management.

For most groups, the main programme structure introduces elements regarding a sound environmental understanding, including:

- understanding the value of natural habitats, especially those in the rain forests
- understanding biodiversity, its genetic and evolutionary basis, and the kind of work required to document this vast diversity in a rich region such as Malaysia.
- the cycling of substances: carbon, nutrient, water, etc.
- consequences of environmental disturbance: floods, climatic change, pollution
- the concept of the ecosystem, food webs, and so on
- recycling and its objectives and impacts

Programme participation requires a nominal fee that covers refreshments and materials, but is heavily subsidized by the University in terms of staff salaries and administrative facilities. All activities are led by instructors. Group leaders (e.g. teachers) are involved where possible and encouraged to create follow-up activities after the visit.

Rainforests and our environment exhibition

Rainforests provide a natural theme for Rimba Ilmu because Malaysia is home to species-rich tropical forests as well as rapid changes to the natural landscape. The special 500-square-meter exhibition opened in 1997 and introduces the essential ecosystem features of rain forests; rain forests as a source of natural products, genetic opportunities, and ecological services; tropical species richness, including endemism, rarity and the existence of special centres of accumulated richness; the degradation and reduction of rain forests; basic ideas on conservation and sustainable management of natural resources; protected area management; examples

of biological diversity; the linkages between organisms; and special habitats such as wetlands.

The rare plants & orchid conservatory

Opened in 2000, the Rare Plants & Orchid Conservatory is part of Rimba Ilmu's expanding effort to provide a better understanding of rare species from a conservation perspective. The collection features rare and threatened species, including plant species that are naturally endemic (or restricted) to particular localities or sites; species that have a relatively wide distribution outside of Malaysia, but which are infrequently encountered (and so are rare) in the country; and species that were once much more common, usually found in lowland forests, but whose range and population have decreased due to habitat loss. This is the only Conservatory in the region with an emphasis on rare plant species.

Special exhibitions and events

Special exhibitions and events, including World Environment Day celebrations, are held at the botanical garden. A special exhibition, 'Rainforest for Health,' was brought to Malaysia in 2001 from the Netherlands. Pamphlets in both the Malay language and English accompanied the exhibit.

Conclusions

In just a short period of time, education programmes have become a strong focus at Rimba Ilmu Botanic Garden and their popularity has steadily increased. To strengthen existing programmes and to support further expansion, the following needs have been identified:

- subsidies to the operating budget, especially to cater to an increasing number of groups
- additional staffing to deliver additional programmes.
- teaching equipment: slide projectors, field (mobile) projection screen, soil augers, diameter tapes, binoculars, computer equipment
- refurbishment of the Rimba Ilmu Activity Centre
- establishment of Interactive Learning Facilities
- funds for publications

With these concerns and needs in mind, Rimba Ilmu is moving forward to strengthening environmental education in Malaysia and to meeting conservation goals outlined in the CBD.

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Article 15 – Access to genetic resources and benefit sharing

Implementing Article 15: A case study from Kew

Article 15 outlines the framework for how genetic resources should be acquired under the Convention on Biological Diversity. Individual contracting states (parties) then decide how to implement the basic principles which state that:

- access must be with the **Prior Informed Consent** of the party providing the genetic resource (15(5)).
- access must be on **Mutually Agreed Terms** (15(4)).
- **benefits should be shared fairly and equitably** with the provider of the genetic resource (15(7)).

To date, although more than 100 countries are developing national legislation addressing 'access and benefit sharing' (ABS), only a handful have actually introduced clear laws outlining how they expect others to access and use genetic material from their country, and what benefits they expect to be shared in return. As significant users and suppliers of genetic resources, botanic gardens have an important role to play in educating and raising awareness of best practice in ABS. Kew's CBD Unit works with staff, visitors, partner institutions and government to spread this message.

Staff: Kew staff conduct 50 collecting expeditions each year, bringing back approximately 5,000 specimens for the herbarium, living collections, and seed and DNA banks. In addition, 54,000 specimens per year are received or borrowed from, or supplied or loaned to other institutions. We have

developed a rolling programme of staff training days to ensure we acquire material legally, use and supply it in line with any special terms, and share benefits. Training involves lectures, a web-based quiz (to familiarise staff with the CBD website), and discussion exercises. We have also developed an intranet staff guide outlining procedures at Kew.

Garden visitors: Kew receives 1.4 million visitors to the garden per year. We want to communicate both how the CBD has changed the way Kew works, and how visitors might be affected. We regularly train our volunteer guides, explaining the basics of the CBD and enabling them to answer questions such as, "Can I take one of these seedlings for my garden?" and "Why can't I buy plants from Kew's collection in the shop?". We help draft correspondence, so that when well-meaning visitors send us plants collected on holiday, we appropriately and clearly explain why Kew can't accept them. In addition, interpretation signs in the garden show how Kew staff collect plants with permission and partners from countries of origin.

Partners and other stakeholders: Kew runs several international Diploma courses for professionals (such as partner institution staff) and contributes to several UK university courses. We have developed a CBD module that introduces students to the CBD, outlines how it can be implemented by botanic gardens, and includes popular role play exercises exploring concepts such as prior informed consent. We have also produced *The CBD for Botanists*, a plain-language user guide/presentation pack on the CBD and ABS, and we are developing ABS pages for the BGCI website.

Governments: We provide practical advice to the UK government and other policymakers on how policy may affect research and collections management, and often participate in the UK delegation to international meetings.

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Article 17 & 18 – Exchange of information and technical and scientific cooperation

The Environmental Education Commission of the Brazilian Botanic Garden Network

The Environmental Education Commission (CEA) of the Brazilian Botanic Garden Network (RBJB) was created during the development of the Brazilian Botanic Gardens Action Plan, part of BGCI's Investing in Nature project. Investing in Nature supports Brazil's 30 botanic gardens in developing public education programmes focusing on the conservation of Brazilian flora.

CEA comprises representatives from five Brazilian geographic regions (south, southeast, northeast, center-west and north), and participants from each region choose their regional representative and deputy. Since it was created, CEA has held several meetings, including during the RBJB annual meetings held in July. These meetings have provided an excellent opportunity for delegates to update their knowledge and expertise, and to participate in a training week supported by Investing in Nature. Themes for the meetings are selected by the participants and have included the urban environment, teacher training, eco-tourism, sustainability and interpretation.

CEA is also involved in a range of activities, including:

- translation and publication of BGCI's *Environmental Education in Botanic Gardens: Guidelines for Developing Individual Strategies*. Eight education case studies from Brazilian botanic gardens were included in the *Guidelines*, which were distributed to members of the RBJB, schools and botanic gardens in Brazil, Portugal and Africa
- translation and publication of *Making your Garden Come Alive: Environmental Interpretation in Botanical Gardens* by Maryke Honigc and published by the Southern African Botanical Diversity Network
- development of the 'Botanic Gardens Go to School.' project. The objective of this project is for gardens to develop a closer relationship with

their local schools and to promote the educational possibilities botanic gardens have to offer

- Model Education Award. Each year, a number of botanic gardens are awarded a grant through Investing in Nature to create new education and conservation projects.

In a country of continental dimensions and with widely diverse socio-environmental and cultural features working on a national level presents a number of challenges. Nevertheless, the different regional characteristics involved make the process all the more interesting and rewarding. To overcome the distance barrier, CEA participants use the internet. During its meetings, CEA forms a mosaic of different colours, flavours, contrasts, cultural expressions and regional accents, bearing a strong resemblance to Brazil's national identity. Current CEA members are José Fernando Vargas, Porto Alegre Botanic Garden, Porto Alegre/RS; Cristiane Speziali, Belo Horizonte Zoo-botanical Foundation, Belo Horizonte/MG; Raimunda Santos de Abreu, Salvador Botanic Garden, Salvador/BA; Helena do Socorro Alves, Emílio Goeldi Museum of Pará, Belém/Pará; Anajulia Salles, Brasília Botanic Garden, Brasília/DF

Dr Tania Sampaio Pereira, Brazil Programme Consultant, BGCI, Institute de Pesquisas Jardim Botânico do Rio de Janeiro, Rio, Brazil. Email: tpereira@jbrj.gov.br

From practice to action

The AG Pädagogik (AGP, Working Group Education) is the education working group of the Verband Botanischer Gärten e.V. (Association of Botanic Gardens), representing about 100 botanic gardens in German-speaking countries. The AGP comprises a range of people interested in supporting botanic garden education. Biologists, education officers, gardeners and teachers all work informally to set targets, develop programmes, courses and publications, and establish national and international contacts.

Three times a year, the 8-10 core representatives of the AGP spend a conference weekend discussing

present and future needs, planning training courses, developing publications, updating the AGP homepage, and contacting staff in other botanic gardens with circulars and articles that they might like to publish in their newsletters. The AGP implements two training courses a year in cooperation with a botanic garden. 'Biodiversity in Educational Practice' was the theme for the most recent course held in March 2004 at Tharandt in the Forstbotanischer Garten of the Technical University Dresden, Germany. The programme was varied and exciting with botanic garden scientists giving lectures about the CBD and their research in, for example, forestry, agriculture and the genetic diversity of endangered species. Time to discuss and exchange experiences is always an important element of the courses, especially for newcomers and sole educators in botanic gardens.

For those unable to participate in the training courses, we publish papers offering practical ideas related to the main themes. For example, *The foxglove calls the bumblebee* provides a wealth of practical advice on how to teach visitors about floral ecology. *Gardens in Autumn* suggests a range of activities, including fruit harvesting

Right: Participants visiting the Forstbotanischer Garden during the training course (Photo: Renate Grothe)





with children, simple experiments to explain the changing climate conditions and dyeing fabrics with leaves or wood.

The AGP has also translated and published BGCI's publication *Environmental Education in Botanic Gardens: Guidelines for Developing Individual Strategies*, and a copy has been sent to every member.

For further information please contact: www.biologie.uni-ulm.de/verband/agpad.

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Résumé

La Convention sur la Diversité Biologique (CDB) a été un des résultats clef de la Conférence des Nations Unies sur l'Environnement et le Développement (Rio, 1992). Ratifiée par 188 pays, la Convention a trois objectifs : la conservation de la diversité biologique, l'utilisation durable de ses composants et le partage juste et équitable des bénéfices provenant des ressources génétiques.



L'éducation et la sensibilisation du public sont une part importante de la CDB et sont transversales, c'est-à-dire qu'elles sont incluses dans les sept programmes de travail de la CDB. L'article ci-dessous consiste en une série de contributions. Il commence par une présentation générale de la CDB puis s'intéresse à savoir combien d'articles de la CDB sont rendus effectifs par l'éducation dans les Jardins Botaniques.

Resumen

La Convención sobre la Diversidad Biológica (CBD) fue uno de los resultados clave de la conferencia sobre el medio ambiente de las NU sobre el Desarrollo y Medioambiente (Río, 1992). Esta fue ratificada por 188 países; la CBD tiene tres objetivos: la conservación de la diversidad biológica, el uso sostenible de sus componentes y compartir los

beneficios que se generen de la utilización de los recursos genéticos de una manera justa y equitativa.

La educación y concienciación pública es una parte importante de la CBD, asimismo es fundamental y básica; tanto que es incluida en los siete programas de trabajo de la CBD. La siguiente contribución consta de una serie de trabajos. Esta comienza con una perspectiva general de la CBD, continuando con cuáles son los artículos de la CBD que están siendo implementados a través de la educación en jardines botánicos.

Details of this convention can be found at www.biodiv.org.

Far left and left: Exchanging experiences are an important element of the courses run by AGP (Photos: Renate Grothe)

Working together

projects bridging conventions!

Convention to Combat Desertification

Right:
Gail Bromley
with members
of Los
Algarrobos

Summary

For the last three years, Gail Bromley from Kew Gardens has been working alongside staff in an Argentinean NGO, Los Algarrobos, to develop and implement education projects in dry-land areas of Argentina. The NGO was originally set up to develop education projects in support of the Convention to Combat Desertification, but soon recognised that conservation of watersheds was intrinsically linked to the conservation and sustainable management of biodiversity. Having little knowledge of current efforts and activities in biodiversity education, the

director of Los Algarrobos contacted Gail and together they have been working to support a number of rural and community education programmes including a distance learning course for teachers, watershed management for the San Roque and sustaining arid land agro-biodiversity. In this article, Gail explains a little of the work under progress and how certain groups are linking up to help deliver conservation and education in Argentina.

Right: Children
are the ultimate
recipients of the
biodiversity
education
programme



Argentina such as the State of Cordoba and many of the poorer north-eastern states such as Salta, Catamarca and Jujuy. ACLA staff quickly recognised the need to encourage the implementation of specific actions at the *local* level on drylands and forest ecosystems and to develop education materials that would contribute to a more effective implementation of the Rio conventions.

Andrew and I looked at how we could enhance the biodiversity education element of a long distance education course on environmental issues they were developing. The 20 week radio broadcast course was targeted at primary teachers in rural areas and offers basic information, with a follow-up programme of activities for the teacher to carry out. These activities are submitted and assessed by trained education supervisors.

In each state the course is run, the ACLA education team work with staff from the Ministries of Education, Environment, Sustainable Development and Tourism/Culture. Additionally, the Education Ministry credits teachers who successfully complete the course with the maximum training points

Introduction

Translating international conventions into education programmes at the local level is a challenge that has always interested me. It therefore came as an exciting opportunity to work on a joint project with Andrew Joseph Hamilton, Director of Asociacion Civil de Los

Algarrobos (ACLA), an NGO based in Argentina. The organisation acts as a UN 'focal point' for the Convention to Combat Desertification; implementing forestry programmes, conducting research and promoting sustainable development at the national level as well as supporting the role of women and capacity-building in local communities. Much of their work supports communities in arid zones of

available (a reflection of its excellent standing amongst education officials). In recent times, the challenge posed by the intricate relationships of climate, biological diversity, drought and desertification on the social, economic and environmental fronts has been recognised in many countries. This course was set up to help people start to implement and encourage corrective measures. This basic course covers a range of issues including climate change and desertification, pollution, biodiversity, sustainability, basic ecology, etc.

For each state, modules such as the one on biodiversity vary to explore key local issues. In Jujuy, for example, local biodiversity issues include over-exploitation of fuel wood, inappropriate animal husbandry, impact of tourism in a newly designated World Heritage Site, pollution from agrochemicals and the local loss of knowledge in the range of potato and bean species and cultivars – for which the area is a ‘biodiversity hotspot’. In the state of Cordoba, tourism, pollution and removal of local biodiversity have seriously impacted on the watershed of the San Roque area, which supplies all of the water for this region. These local issues are highlighted, discussed and corrective measures recommended, so that the teachers can start to implement a range of teaching programmes to explain and explore these problems with schoolchildren and, through them, their families. Each

teacher who signs up for the course gets a large manual that covers the transcript of the broadcast tapes (made as a series of ‘conversations’ between two women teachers), a series of activities to complete, background resource material and information and resource directories.

ACLA also saw the need for a very pragmatic approach and raised large amounts of money to establish not only radio masts for these remote rural areas to support their communication, but also ‘garden nurseries’. The idea is for children and teachers to use them as a learning resource; grow food and eat more healthily, learn horticultural techniques and celebrate local crops. The course itself is also completely free, as ACLA has managed to enlist the financial support of a number of local and national companies.

The launch of each new state programme is prefixed by meetings and discussions with local teachers and the media (radio and TV). ‘Biodiversity’ workshops are also run to promote the course and offer ideas and teaching methodologies such as games, artwork and theatre to help children understand environmental issues. One of the greatest spin-offs of the course has been the fact that the school is often the centre of activity and culture for these remote villages. Because of the lack of transport and difficult terrain, many children board at school for up to a year and many



schools provide a central cooking and eating point for everyone in the village. Everybody usually tunes in to the radio broadcast, and often locals are quite keen to help out with activities, the school nursery and any follow-up conservation projects. At the workshops, participants may include not only teachers but local tourism staff, shopkeepers, farmers and craftspeople – in fact anyone who is interested! As you might imagine this usually leads to exciting and innovative workshops – although numbers have sometimes tended to get a bit unwieldy with 400 participants turning up on one occasion!

Increasingly, teachers also hand on or share their materials with other teachers who have not signed up for the course. Ultimately this does not matter to ACLA, as it is hoped that everyone exposed to the messages will

Above and bottom left: The surrounding landscape indicates the relevance of the CCD (Photo: Gail Bromley)



Left: Training teachers in environmental education involves theory and practice. (Photo: Gail Bromley)



Above: Los Algarrobos supports education programmes that sustain arid land agrobiodiversity (Photo Gail Bromley)

become more 'aware' of the local issues and thus more likely to support measures to enhance sustainable activity in the community. Currently the course outcomes are being evaluated and include:

- materials and displays from schoolchildren
- media reports of 'conservation, recycling, sustainable resource management, 'pollution control' projects in the area implemented by the local communities
- teacher and school reports
- oral conversations with local people
- changes in local constitutions/laws etc in favour of sustainable practices
- requests for further information and resources
- festivals celebrating local culture and natural resources etc.

Some very good materials are being gathered that will demonstrate the impact of the course. Hopefully this will stimulate the 'roll-out' of the course nationally.

Right: Dramatic landscapes abound in the Los Algarrobos region – Gail and one of the formidable desert inhabitants (Photo Gail Bromley)

As a result of the initial training course, other projects have developed. The first is a 'basic' course on 'sustainability and environmental management' targeted at such groups as company managers, local authority and utility officials and key tradespersons. The second is the establishment of 'biodiversity interpretation centres' (BICs) in each state. These are in the process of being developed 'by the people, for the people'. They are being overseen by ACLA in collaboration with various Ministries, local authorities, university departments, local teachers/ schoolchildren and NGOs. The centres

will comprise a physical structure, set into or near a key biodiversity area, where local staff and volunteers will offer activities, events, displays, information and resources that will highlight local key issues,

We all know that desertification and biodiversity mismanagement or loss can only be reversed through profound changes in local (and international) behaviour. Little by little, with integrated practices such as these, the changes will ultimately lead to sustainable land use and food security for a growing world population. Education empowering communities, conservation and careful water management, let's have more of it!

Résumé

Durant les trois dernières années, Gail Bromley des Jardins de Kew a travaillé côte à côte avec le personnel d'une organisation non gouvernementale Argentine, Los Algarrobos, pour développer et rendre effectifs des projets d'éducation dans des zones sèches d'Argentine. L'ONG avait, à l'origine, développé des projets éducatifs en s'inspirant de la Convention sur la lutte Contre la Désertification, mais elle a rapidement reconnu que la conservation du bassin hydrographique était intrinsèquement liée à la conservation et à la gestion durable de la biodiversité. Ayant peu de connaissances dans ce domaine et sur les activités d'éducation à la biodiversité, le Directeur de Los Algarrobos a contacté Gail. Ensemble ils ont collaboré à l'appui de nombreux programmes éducatifs ruraux et communautaires notamment des cours à distance pour les enseignants, la gestion du bassin hydrographique pour le San Roque ainsi que le maintien de l'agro-biodiversité des paysages arides. Dans cet article, Gail apporte des informations sur le travail en cours et comment certains groupes se sont mis en réseau pour délivrer un message de conservation et d'éducation en Argentine.

Resumen

Durante los últimos 3 años, Gail Bromley, de los Jardines Reales de Kew, ha estado colaborando con personal de una ONG en Argentina,

Los Algarrobos, en el desarrollando e implementación de proyectos educativos en las zonas áridas de ese País. Inicialmente la ONG se dedicaba a organizar proyectos educativos para apoyar la Convención de lucha Contra la Desertificación, poco después se reconoció que la conservación de las cuencas estaban intrínsecamente relacionadas con la actividades de conservación y manejo sustentable de la biodiversidad. Con el escaso conocimiento de los esfuerzos y actividades actuales en la educación de la biodiversidad, el director de Los Algarrobos se puso en contacto con Gail, desde entonces han estado trabajando juntos brindando apoyo a las comunidades rurales con programas para maestros de educación, en los que se incluye la universidad a larga distancia, manejo de la cuenca de San Roque y la sostenibilidad de agrobiodiversidad de las zonas áridas. En este artículo, Gail explica un poco de este trabajo y su progreso, así como algunos grupos que están uniéndose en una iniciativa para cumplir con la educación en la Argentina.

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RBG, Kew is grateful to the British Council and ACLA for their generous support of this project.

Details of this Convention can be found at www.unccd.int.



Education as a tool for the conservation of wetlands

Ramsar Convention on Wetlands

Introduction

The RSPB is a member of a global network of organisations called BirdLife International. Many of these organisations have education programmes linked to priority sites for biodiversity. In many countries, internationally important wetland sites are designated under the Ramsar Convention on Wetlands. The Convention's mission is 'the conservation and wise use of all wetlands through local, regional and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world'. There are presently 142 countries that are signatories to the Convention, with 1389 wetland sites designated for inclusion in the Ramsar List of Wetlands of International Importance.

Wetland education programmes

Wetlands can be excellent sites for education programmes aimed at schoolchildren. They are habitats that provide relatively easy opportunities to see a variety of birds and other biodiversity. Provided there is safe access, freshwater sampling is an educational activity that children of any age enjoy. At RSPB wetland sites, we provide wooden platforms (see photo) to enable children to investigate the fascinating web of life. Identification charts, coupled with the expertise of our education officers, enable children

Summary

Wetlands are essential for biodiversity and people. Covering about 6% of the world's surface, they occur in every country, from the tundra to the tropics (Thorsell et al, 1997). As well as providing freshwater for countless species of plants and animals, wetlands support large numbers of birds, mammals, reptiles, amphibians, fish and invertebrate species. Wetlands also provide economic benefits, for example water supplies, fisheries, agriculture, timber production, recreation and tourism opportunities. Wetlands are an important part of our cultural heritage, providing us with a source of inspiration and forming the basis of local traditions.

Despite their enormous value, many wetlands are being damaged and destroyed because of pressure from people. Threats from development for industry, housing, roads and marinas have permanently destroyed many significant wetlands around the world. Other regular losses or damage of wetlands are caused through drainage and pollution. They are one of the most vulnerable habitats on our planet and it is essential that we develop knowledge, understanding and action for improved protection and management of these fantastic places. Wetlands provide excellent opportunities to educate schoolchildren, decision-makers and other target audiences. Many of these sites are ideal for education programmes that can develop knowledge, understanding and action in support of nature conservation. This article introduces RSPB's approach to education in wetlands in the UK, with reference to some of its international education work.

to understand concepts such as food chains and adaptation. We always ensure that there is a strong conservation message. It is important that a visitor to a wetland site understands that it is a fragile habitat that needs management and protection. In my experience, many of the education techniques and activities aimed at schoolchildren are also effective when used with adults.

Community education programmes

It is usually important to gain the support of communities around a wetland. Through developing a community education programme, the key audiences can be identified. These audiences can influence the management and protection of a

Below:
Wooden
platforms at an
RSPB site allow
children easy
access to the
wonders of the
wetland area
(Photo: Barrie
Cooper)





Above: Children investigating the fauna they have discovered in a nearby pond (Photo: Barrie Cooper)

wetland. Decision-makers are obviously a key audience; but who are they and how can they be influenced? In my opinion, an important audience is local schools and their students. Schools are at the heart of any community and children can be effective communicators of conservation to other audiences. I have been involved in several education programmes in England and overseas where children have been important ambassadors for conservation. Two examples are included here.

The Ribble Estuary

The Ribble Estuary is a Ramsar site on the north-west coast of England. It is one of the most important sites in Europe for migrating wading birds and wildfowl. In the early 1990s, there were several threats to some key areas on the estuary. Many of the decision-makers in one city were supporting the building of a bridge and a marina; these developments would have had a significant detrimental impact on key feeding and resting areas for migrating birds. There was a strong opposition to nature conservation by many of the decision-makers. I approached some of the decision-makers to gain their permission for an education programme for schools to visit the estuary. Some of the politicians thought I was crazy: "The only people interested in the birds out there, are you birdwatchers!" was a comment I will never forget. "I disagree; I think schools will visit and I think local people and tourists may be interested as well" was my reply – it turned out to be a profound statement!

I did get permission and so developed an education programme for schools to visit the estuary. I also used a local building as a temporary classroom. 50 schools visited during the first three months of the project and it became an immediate success. The programme

was linked to the National Curriculum and included themes such as: adaptation, food chains, human impact on the environment and conservation. Local people and tourists would often be interested in the work we were doing with schools and would listen to the dialogue between our education officer and schoolchildren. We therefore decided to open a visitor centre and run a varied programme of events for families and adults, in addition to children. This groundswell of local interest and support was significant for influencing political opinion. The local decision-makers dropped their plans for the bridge and marina. We had 'educated' them about the importance of the need to protect the site. They realised that there were sustainable economic benefits by having a Ramsar site within their boundaries.

The quality of life for local people is another significant benefit. Surely, it is better to be able to walk alongside a beautiful wetland full of biodiversity with flocks of birds calling in the background, rather than through a concrete jungle? We need to start reaching more decision-makers to enable them to understand the importance of biodiversity. They need to know how it benefits people economically as well as qualitatively.

The programme has always been promoted as a partnership between RSPB, the local government and a water company that invested money for extra staffing and for improvements to the visitor centre. Ten years after we started the operation of a small-scale programme for schools, the benefits are tangible. Local hoteliers sought my advice to guide the development of weekend breaks that focused on birds and wildlife. Research by the local government showed that local people and tourists rated this programme as the best attraction in the area. The future for the birds and other wildlife of the Ribble Estuary is now more secure than it has ever been; education was a key tool in achieving this.

Morecambe Bay

This is another Ramsar site on the north-west coast of England. Like the Ribble, it is also one of the most important sites for migrating wading

birds and wildfowl. The town of Morecambe was once a popular seaside resort. However, during the 1970s, its popularity began to wane. In the mid-1990s, the local government recognised they needed to take urgent action to change Morecambe's image and to regenerate tourism and economic development. As a part of this process, the local planners invited RSPB to hear their plans to create a series of sculptures and other artwork themed to celebrate the importance of Morecambe Bay for birds. The project started with input from RSPB and now a range of wonderful artwork has been created along the seafront. This has made a positive impact on local people and tourists. It is a unique and visually appealing approach to the celebration of an international wetland. The tourist office was able to access external funding to pay RSPB to run an annual programme of events for children and adults. The events were linked to the birds of Morecambe Bay. The local hoteliers at this site also asked me to advise them about developing weekend holiday breaks for nature lovers.

Teacher training

When an education programme is targeted at schools, it can be beneficial to organise training courses for teachers. The courses can include information about the site, ideas for programmes and projects in schools, training of environmental games and activities. If the training is done in an interactive way, it can be very popular with teachers and make a significant impact with the implementation of the programme in the local schools.

RSPB's international education

There is insufficient space to go into detail about the full extent of how we share our educational expertise, but a few examples are provided here.

The Gediz Delta, Turkey

The Gediz Delta is a Ramsar site on Turkey's west coast, close to the city of Izmir. During recent years, a large part of the wetland has been reclaimed for the rapid development of factories and housing. With support from the RSPB, the Turkish BirdLife Partner, Doga Dernegi, is now working with local

decision-makers and communities to develop education and communication programmes around the delta. Probably the only way to ensure the long-term conservation of this wetland jewel will be through effective education programmes.

Capacity building of educators

It is important to share expertise in conservation education. In my opinion, good ideas and activities are universal – they can be used in any country. A training course I ran in Mongolia in 2003 is evidence that educators always appreciate good ideas for their programmes. The course was located on the Mongolian steppe and involved staff from Ramsar sites in China, Russia and Mongolia. The development of site-based and community education programmes was the priority for the training. The sites have now started to develop their education programmes and some of the trainers are spreading the ideas to other countries including Kazakhstan and Japan.

In the near future, BirdLife is hoping to develop a wetland education programme in some countries around the Mediterranean. The programme will include the training of education officers and the implementation of an education programme at a selected Ramsar site in each of these countries.

Conclusions

Education is a vital tool if we are to improve the long-term protection of biodiversity. We have to reach out to key audiences, including decision-makers, teachers and children. We need to take them on a fantastic journey of exploration to introduce them to the magic of the natural world. Wetlands are one of the most vulnerable habitats on our planet; it is essential that we develop knowledge, understanding and action for improved protection and management of these fantastic places.

Wetlands and botanic gardens are ideal sites to begin the education of decision-makers, schoolchildren, teachers and other target audiences. They can provide the important starting point for people to begin the journey of understanding, support and action for the conservation of biodiversity.

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Résumé

Les zones humides sont essentielles à la biodiversité et aux hommes. Elles couvrent environ 6 % de la surface terrestre et sont présentes dans tous les pays, depuis la toundra jusqu'aux tropiques (Thorsell et al, 1997). Non seulement les zones humides fournissent de l'eau douce pour les plantes et les animaux, mais elles hébergent un grand nombre d'espèces. Les zones humides apportent également des avantages économiques, par exemple : pêcheries, production de bois et transport ainsi que loisir et tourisme (Ramsar, 2005). Elles constituent une part importante de notre patrimoine culturel, formant une base aux traditions locales et sont sources d'inspiration esthétique. En dépit de leur valeur, beaucoup de zones humides sont endommagées et détruites à cause de la pression générée par l'homme. Il est essentiel que l'on développe nos connaissances, notre compréhension et notre action pour une meilleure protection et gestion de ces habitats vulnérables. Les zones humides présentent d'excellentes opportunités pour l'éducation des scolaires, des décideurs et d'autres publics cibles. Nombre de ces sites sont idéals pour des programmes d'éducation susceptibles de développer une attitude en faveur de la conservation de la nature. Cet article présente l'approche de la RSPB par rapport à l'éducation dans les zones humides du Royaume Uni, en faisant référence à son travail international lié à l'éducation.

Resumen

Los humedales son esenciales para la biodiversidad y para la gente. Cubriendo acerca 6% de la superficie mundial, ellos ocurren en cada país,



desde la tundra a los trópicos (Thorsell et al, 1997). Así también como ellos proveen de agua fresca para las plantas y animales, los humedales soportan un numero grande de especies. Los humedales también

proven de un beneficio económico, por ejemplo: pesca, producción de madera y transporte, así también como recreación y turismo (Ramsar, 2005). Ellos son una parte importante de nuestra legado cultural, formando las bases para la tradición local y ofrecen una inspiración estética.

A pesar de su valor, muchos humedales están siendo destruidos a causa de la presión poblacional. Es esencial que nosotros desarrollemos conocimiento, entendimiento y acción para la protección y manejo de estos hábitat vulnerables. Los humedales proveen oportunidades excelentes para educar escolares, hacedores de decisiones y otras audiencias. Muchos de estos sitios son ideales para programas de educación que pueden desarrollar los atributos requeridos para la conservación de la naturaleza. Este artículo introduce una aproximación de la Royal Society for Protection of Birds (RSPB's) para la educación en los humedales en el Reino Unido, con referencia a algunos de sus trabajos educativos a nivel internacional.

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Details of this Convention can be found at: www.ramsar.org

Above and left: Wetlands can be excellent sites for education programmes aimed at school children (Photo: Barrie Cooper)

Biodiversity education at Kirstenbosch Botanical Garden World Heritage Convention

Summary Kirstenbosch National Botanical Garden, in Cape Town is situated on the slopes of Table Mountain and falls within the Cape Floristic Region which has been inscribed as South Africa's sixth World Heritage Site. This is the first time that a botanical garden has been recognised as a natural World Heritage site. In the following article Donovan Fullard describes the Kirstenbosch Environmental Education Programme and explains how it supports the mission of the World Heritage Convention: *To encourage participation of the local population in the preservation of their cultural and natural heritage.*

The aim of the programme is to inspire and enable people from all walks of life to take responsibility for their environment. The programme primarily targets the learners/youth from the disadvantaged areas and under-resourced schools from the Cape Flats in the Western Cape to participate in its exciting and curriculum linked garden-based and outreach greening programmes which cover a wide variety of themes, learning programmes and activities.

- school indigenous greening (outreach greening) programme
- teacher professional development
- resource and curriculum development.

The aims of the programme are:

1. to develop effective environmental education and interpretation programmes that respond to international and national environmental policies and legislation
2. to make the gardens more educationally relevant and accessible to all teachers and learners, particularly those who in the past did not have the opportunity to visit
3. to contribute to transformation in education through our programmes and networks
4. to promote the education value of indigenous gardens in schools.
5. to ensure effective communication and networking within SANBI, and between SANBI and the public and others involved in environmental education
6. to contribute to the transformation process by appointing staff from previously disadvantaged groups wherever possible, and providing support and mentorship to enable staff to develop to their full potential

The important role of education to attain sustainable development is recognized globally. Willison (1997) argued strongly for botanic gardens to engage in 'stronger' forms of eEducation for sSustainability. She describes this as a 'holistic approach to education which emphasizes the interrelationship of disciplines'. In South Africa, education

Introduction

The people of Cape Town are immensely proud and excited about the honour that was bestowed on their garden - for the first time a botanical garden has been recognized as a natural World Heritage Site. However, in my opinion, a great number of Cape Town's people living on the Cape Flats (an area created during the Apartheid era) do not share in this excitement, either because they are not aware of or feel indifferent to this achievement because of its 'non-relevance' to their lives. Socio-economic factors such as poverty, unemployment and crime are the high-priority issues in their lives. Friedman, H (2003) in her article *Survival of the greenest in the Cape*, says that "to most kids living on the Cape flats, the term 'wildlife' means negotiating a daily gauntlet of gangs, violence and drugs." One of the aims of Kirstenbosch's education

programme is to offer these children (from strife-torn townships like Mitchell's Plain, Khayelitsha, Lavender Hill) the opportunity to experience 'wildlife' of a different kind - the rich biodiversity of a world famous indigenous botanical garden.

Environmental education programme

Kirstenbosch National Botanic Garden offers an environmental education programme to all learners in Cape Town and surrounding areas, but particularly to those from disadvantaged areas. The programme is located within the education directorate of the South African National Biodiversity Institute (SANBI) a government parastatal, formerly known as the National Botanical Institute. It focuses on four key areas:

- a garden-based education programme



plays a critical role in ensuring improvements in the quality of life of all people, the eradication of poverty, reducing inequalities and promoting sustainable development and growth (Wagiet, 2002). I also believe that in South Africa environmental education has, and can still, contribute significantly to transformation and development.

At Kirstenbosch, we strive towards offering an environmental education programme that adheres to the principles of EfS and is aligned to our national curriculum statement policies. In addition, we strongly associate with the following definition of environmental education - describing it as a 'responsive process of change' involving the development of capacity to 'collaboratively develop capabilities (tools, resources, action competencies) to deal with and encourage change in local contexts' (source unknown). In the past, our key focus areas functioned in isolation whereas now, we strive towards integrating our various programmes to achieve a more meaningful and holistic approach.

Garden-based programme

On average about 8 -11 000 learners from Grade R – 12 participate in the activities offered per year as part of the guided school programme. The programme is popular and primarily supports formal education with exciting, hands-on activities that engage learners with indigenous plants and issues related to the sustainable use of these plants. Themes on offer include Introduction to Kirstenbosch and Fynbos, Plants and People, Ecology, Water, Biomes, Plant reproduction, Plant adaptations and Travel and Tourism. Biodiversity issues are addressed in all these programmes, but since the transition from the Botanical to Biodiversity institute, we have begun with the development of a new Biodiversity programme. The programme focuses on experiential learning and learners are actively

encouraged by education officers to participate in their groups through discussion and debating of issues. Learners are also encouraged to reflect critically on environmental issues and to make connections between the issues they encounter and their lives. An example here is their experience in the Useful Plants Garden where the sustainable use of useful and medicinal plants are not just explored, discovered and investigated, but also probed and linked to their lives from a socio-cultural perspective.

The Kirstenbosch Outreach Bus provides transport for learners from under-resourced schools to attend the programme. The most visits recorded are from schools of Mitchell's Plain and Khayelitsha – these areas were identified by President Thabo Mbeki for socio-economic upliftment. Our programme has been fortunate to receive funding from the National Lottery Fund, which makes it possible for us to provide transport to 50 schools from disadvantaged areas to bring a group of 180 learners on a free visit to our Biodiversity Education and EfS programmes for the next three years (2005-2007). An environmental audit will be carried out at each school and the impact of our programme will be closely monitored and evaluated by staff members as well as external consultants. The selection criteria used to identify schools included schools that have been on our outreach greening programme and never visited the garden, schools that have shown commitment to the environment, schools that visit regularly but have difficulty paying and schools with learners with special needs.

Outreach greening programme

Currently we have developed 46 indigenous school gardens on the Cape Flats (Nyanga, Langa, Gugulethu, Mitchell's Plain, Manenberg and Khayelitsha). These schools are part of the Kirstenbosch indigenous school

gardening programme and are all at different levels of involvement with the programme, ranging from first to third year and beyond.

The aims of the outreach greening programme are:

- to establish indigenous, water-wise school and community gardens
- to encourage ecological awareness and environmental responsibility
- to develop gardening skills to enable economic empowerment and local environmental action
- to promote the educational value of indigenous plants and gardening
- to develop partnerships between communities and organizations.

We have received funding from the government's Department of Environmental affairs and Tourism as part of the Greening of the Nation project to 'green' schools and communities over the next three years. We have selected 17 new schools from the Cape Flats who will join our three year outreach greening programme as well as several community organisations such as an HIV/AIDS group, women's empowerment group and community greening groups.

The first two years of the indigenous school greening programme focus on horticultural training of 'Green Teams' (representative of all stakeholders – learners, teachers, ground persons and community members) at schools and garden development. To ensure sustainability of the project we introduce a series of workshops with teachers from year two. Teachers collaboratively develop teaching and learning support materials to use in the garden as a resource for education. With the integration of our garden-based, outreach greening and teacher professional development programmes we promote a strong 'action competence approach' to environmental education (Jensen & Schnack, 1997). The development of skills such as critical thinking, problem solving and interpersonal skills, form the basis of our work and is what we try to promote and achieve through our programmes at Kirstenbosch. By introducing learners and teachers to our programmes we hope to stimulate the development of a 'critical perspective' that will hopefully lead to 'concrete action'.

Left:
Kirstenbosch
aims to offer
children the
opportunity to
experience
biodiversity for
themselves.
(Photo:
Donovan
Fullard)

A success story as evidence of our goal was achieved when West End Primary school (from a disadvantaged community in Mitchell's Plain) visited our programme for the first time at the end of 2003. Both learners and teachers found the programme to be extremely invigorating and of great value to them. They successfully applied to join the outreach greening programme in 2004 and have since converted a sandy and barren part of their school yard into a beautiful indigenous garden. Learners, teachers and ground staff are working side-by-side to take responsibility for their environment and contributing to whole school improvement. One teacher at the school commented "The garden has given new meaning and purpose to our lives at school which under normal circumstances were dominated by negativity and frustrations."

Teacher professional development

The Kirstenbosch programme has always played a crucial role as a service provider in the implementation of the education transformational processes, specifically Outcomes Based Education and the Revised National Curriculum Statement Policies (RNCS). Currently staff are supporting foundation phase educators with the implementation of the RNCS within SANBI's context through a process of participatory action research. As part of post-graduate research, staff members collaborate with teachers and curriculum advisors from the provincial education department in the development of new and special programmes, teaching and learning support materials, etc.

Resource and curriculum development

The development of teaching and learning support materials to support our programme and that of the formal curriculum are key features of the Kirstenbosch programme. The centre offers a wide range of resources and facilities available to educators. The Greening Manual published in 2002 is an excellent indigenous gardening handbook for South African Schools developed by staff. A brochure and support materials

on biodiversity will be developed in 2005 to assist teachers with their programmes at school.

Conclusion

Kirstenbosch environmental education programme strives at all times to provide quality education about, in and for the environment to contribute to the building of a responsible and environmentally active citizenry. We realise that Kirstenbosch, as a world renowned botanic garden as well as a World Heritage site, has much to offer EfS and that we are ideally placed to work with local communities, especially through our outreach greening programmes, to resolve environmental problems. In so doing, we endeavour to support UNESCO's World Heritage mission to encourage participation of the local population in the preservation of their cultural and natural heritage.

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Résumé

Le Jardin Botanique National de Kirstenbosch à Cape Town est situé sur les versants du Table Mountain et appartient à la Région florale du Cap qui a été inscrite comme sixième site du Patrimoine Mondial de l'Afrique du Sud. C'est pour la première fois qu'un jardin botanique a été reconnu comme site naturel du patrimoine mondial. Dans l'article qui suit, Donavan Fullard décrit le programme d'éducation environnementale de Kirstenbosch et explique comment il soutient la mission de la Convention sur le Patrimoine Mondial: à *encourager la participation de la population locale à la préservation de leur patrimoine culturel et naturel*. La mission du programme est d'inspirer des gens de tous bords et de les rendre aptes à prendre des

responsabilités pour leur environnement. Le programme vise avant tout les étudiants/jeunes des régions désavantagées et des écoles en manque de moyens des Cape Flats dans le Western Cape pour les faire participer à ses programmes excitants de verdissement reliés par curriculum, tant basés au jardin que tournés vers l'extérieur et qui couvrent une variété de thèmes, de programmes d'enseignement et d'activités.

Resumen

El Jardín Botánico Nacional de Kirstenbosch, en la Ciudad del Cabo, está situado en las laderas de Table Mountain, y cae dentro de la región florística del Cabo, y ha sido inscrito como el sexto lugar en Sudáfrica declarado Patrimonio Mundial de la Humanidad. Fue el primer jardín botánico declarado Patrimonio Mundial Natural de la Humanidad. En el artículo que sigue Donavan Fullard describe el Programa de Educación Medio Ambiental de Kirstenbosch y explica como apoya la misión de la Convención de Patrimonio Mundial: el promocionar la participación de la población local en la preservación de su patrimonio cultural y natural.

El programa se propone inspirar y permitir a la gente de todas partes a reconocer su responsabilidad por el medio ambiente. El programa sobre todo se dirige a los jóvenes de zonas menos aventajadas y de los colegios bajos en recursos de Cape Flats en el Cabo occidental, para que participen en sus apasionantes programas, relevantes al currículo, con actividades tanto dentro como fuera del jardín, relacionadas a una gran variedad de temas, programas educativos y otras actividades.

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Details of this Convention can be found at: <http://whc.unesco.org>

Sarah Kneebone

A vital role for botanic garden educators in plant conservation:

the Global Strategy for Plant Conservation and you!

Summary Plants are a vital part of the world's biodiversity and an essential resource for human well-being. Yet, despite our reliance on them, a crisis point has been reached – it is thought that between 60,000 – 100,000 plant species are threatened worldwide (GSPC, 2002).

In 2002 the Global Strategy for Plant Conservation was legally adopted by all governments who are signatories to the Convention on Biological Diversity. Using a clear set of targets, the GSPC provides a framework for actions to bring about plant conservation, sustainable use, benefit-sharing and capacity building at global, regional, national and local levels with the ultimate goal to halt the loss of plant diversity.

Target 14 of the strategy involves 'Promoting education and public awareness about plant diversity: The importance of plant diversity and the need for its conservation incorporated into communication, educational and public-awareness programmes'. Botanic Gardens Conservation International (BGCI) is the facilitating partner for Target 14 and has been working on consultations to produce targets and milestones for its achievement. Botanic garden educators are a major stakeholder within the biodiversity education field and BGCI is keen to gain your input.

The Strategy was initiated at the Botanical Congress in St Louis 1999, with a call for plant conservation to be recognised as an urgent international priority. Following this, interested parties met in Gran Canaria, Spain, and produced a declaration. The declaration was presented to the CBD Conference of the Parties, who then agreed that a specific strategy for plant conservation was needed. The initial production of the Global Strategy was in conjunction with many national and international organisations including, IUCN-World Conservation Union, International Plant Genetic Resources Institute (IPGRI), United Nations Environment Programme (UNEP), the Food and Agriculture Organisation (FAO), WWF, United Nations Educational, Scientific and Cultural Organisation (UNESCO) and BGCI. These organisations now act as facilitating partners for each of the adopted targets and are responsible for

Introduction

The Global Strategy for Plant Conservation (GSPC) outlines a series of targets through which the ultimate aim of halting the current and continuing loss of plant diversity can be achieved. The Strategy provides a framework to 'facilitate harmony between existing initiatives aimed at plant conservation, to identify gaps where new initiatives are required, and

to promote mobilization of the necessary resources.' It is also 'a tool to enhance the ecosystem approach for the conservation and sustainable use of biodiversity and focus on the vital role of plants in the structure and functioning of ecological systems' (GSPC, 2002).



Left: The GSPC is a tool to enhance the ecosystem approach to conservation (Photos: Sarah Kneebone)

Left: Capacity building in Russia supports Target 15 of the GSPC
(Photo: Sarah Kneebone)

arranging consultation meetings to agree on subtargets, practical measures and milestones.

What are the objectives of the GSPC?

The objectives of the GSPC are grouped into five themes:

- understanding and documenting plant diversity
- conserving plant diversity
- using plant diversity sustainably
- promoting education and awareness about plant diversity
- building capacity for the conservation of plant diversity

The strategy outlines the different aspects of these objectives in a series of 16 targets together with the terms and technical rationale for each.

Why is the GSPC relevant to botanic gardens?

Right: Target 11 of the GSPC – no species of wild flora endangered by international trade
(Photo: Sarah Kneebone)

Most of the targets are directly relevant to the work of botanic gardens. Indeed target 14 is particularly relevant in that it provides a legislative defence of the validity of education in botanic gardens and highlights its importance in the efforts for plant conservation. For a full list of targets, visit BGCI's website www.bgci.org/conservation/strategy.html

So, we've got the targets, what now?

The next step of the process is to work out exactly how the targets are to be implemented. This will take place at international, national and subnational levels. By identifying the component parts of the targets, activities and milestones will be developed and incorporated into relevant plans, programmes and initiatives, including national biodiversity strategies and action plans. The GSPC targets are subject to continual consultation and revision. Facilitating partners for each target coordinate consultations with relevant stakeholders who propose practical suggestions for taking the GSPC forward. These facilitating partners meet regularly to report on progress within their consultations, whether these are local, national or international. Given that botanic garden educators are relevant stakeholders in most of the GSPC targets, it is important that they contact the relevant lead organisations and CBD focal points to express their commitment to this process.

Target 14

This Target focuses educators on the inclusion of plants (their conservation,



diversity and importance) in environmental education. Creating active support for plant conservation by empowering the general public through increased knowledge, appreciation and understanding of plants is a vital aspect of the GSPC. As with many conservation issues the support of the masses is critical to its success.

To date, consultation on Target 14 has included:

- sending the consultation document to all botanic gardens and major international organisations
- workshops held in Romania, New Zealand and Canada by local plant conservation networks
- an initial consultation workshop held by BGEN (Botanic Garden Education Network, U.K.)
- a workshop run at the 2nd World Botanic Gardens Congress, April 2004 to discuss practicalities of national sub targets

The sub targets under consultation are:

- Sub target 1:
A national survey carried out to determine general level of awareness of plant diversity and conservation
- Sub target 2:
A framework for the implementation of Target 14 by the end of 2005
- Sub target 3
Analysis of how education and communication instruments can be used to support the implementation of all targets of the GSPC

For more information, or to offer suggestions or feedback on these subtargets please contact julia.willison@bgci.org.

The beauty of Target 14 is that anyone involved with environmental education (formal and informal) can play an active role in its achievement. BGCI's role is



to encourage as many botanic gardens as possible to contribute to the GSPC. One of the ways we do this is through publishing case studies in *Roots* and on our website (www.bgci.org/education/gspc_and_education).

What are the implications of the GSPC for educators in botanic garden?

There are many aspects of the GSPC that botanic garden educators can become involved with and use to their advantage:

- support the development of education programmes to implement Target 14
- develop the capacity of all staff to implement Target 14 – building capacity is a target of the GSPC
- participate in workshops concerned with the implementation of other GSPC targets
- publicise their work through the BGCI and CEPA websites

CEPA refers to Communication, Education, Participation and Awareness. The CEPA work programme was approved by the parties to the Convention on Biological Diversity to address commitments to Article 13, Public Education and Awareness. This programme includes the CEPA portal, whose website address is <http://www.biodiv.org/programmes/outreach/cepa/home.shtml>

How are botanic garden educators currently supporting the GSPC?

Many botanic gardens worldwide are already doing huge amounts of work that supports the aims of the GSPC. A recent survey (carried out by BGCI, November 2004) of BGEN members provides some excellent ideas and ways in which educators are already contributing to the GSPC.

Target 11 – No wild species of flora endangered by international trade

The Eden Project, Cornwall, has an exhibit about the uses and sources of different timber types from around the world in their Humid Tropics Biome. Cambridge University Botanic Garden has interpretation panels explaining the

significance of CITES within their glasshouses. The Royal Horticultural Society produces a leaflet for the public all about CITES.

Targets 9 and 13 – Conserving crop plants and plant resources and their associated indigenous and local knowledge

Chester Zoo has displays and interpretation of medieval and herbal gardens – looking at plant use now and in the past. Glasgow Botanic Gardens has developed a new herb garden and booklet about the ethnobotany of the wild plants of Scotland. Middleton, National Botanic Gardens of Wales have a ‘Physicians of the Myddfai’ exhibition and programmes promoting medicinal plants. Chelsea Physic Garden, London, catalogues the ways in which visitors use plants, particularly traditional herbs for medicines.

Target 15 - Capacity building for plant conservation

Thrive, a national horticultural charity, offers a huge range of training course



in conservation and horticulture. Cruickshank Botanic Gardens at the University of Aberdeen are used by undergraduate and postgraduate students. The Royal Horticultural Society Garden Rosemoor runs teacher training sessions. The University of Dundee Botanic Garden holds courses for the general public and Kew runs diploma courses on education in botanic gardens and in techniques for plant conservation.

Each individual who completed this questionnaire was also directly involved with Target 14 (raising public awareness about the need for conservation of plant diversity) and Target 16 (networks established or strengthened for plant conservation



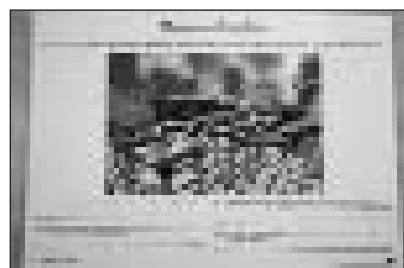
activities) as they all worked in education in botanic gardens and were attending a network congress!

To help educators reflect on how their programmes are contributing to the GSPC, BGCI has developed a survey (www.bgci.org/education/gspc_survey.html). We encourage you to complete the survey so that we can incorporate your examples on the GSPC website for other educators to gain inspiration.

Conclusions

The GSPC is an ambitious and important agreement with the overall aim to stop the loss of

Above: Protected area of plant diversity at Kadoorie Farm and Botanic Garden, Hong Kong
Below: Chester Zoo's displays and interpretation of medieval and herbal gardens support the conservation of indigenous knowledge. (Photos: Sarah Kneebone)





Above: Ex-situ conservation and education – a tour around Kadoorie Farm's endangered species nursery. (Photo: Sarah Kneebone)

plant biodiversity. In order to achieve this goal, many organisations and stakeholders need to work together, focussing their conservation efforts on the relevant targets. With their plant collections, existing conservation work, education programmes and huge numbers of visitors, botanic gardens have an important role to play in implementing the GSPC. Botanic garden educators in particular are already doing this with their education provision. BGCI is keen for botanic garden educators to become involved in the consultations and stakeholder processes currently taking place and to take these ideas and implications of the GSPC back to their gardens for further consideration and action.

Acknowledgement

Many thanks to those BGEN members who completed BGCI's survey on 'What are your education programmes doing that support the Global Strategy for Plant Conservation?'

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Résumé

Les plantes forment une part vitale de la biodiversité mondiale ainsi qu'une ressource essentielle pour le bien-être de l'homme. Toutefois, malgré notre dépendance envers elles, le stade de crise est atteint : il est estimé que 60 000 à 100 000 espèces végétales sont menacées à travers le monde.

En 2002 la Stratégie Mondiale pour la Conservation des Plantes a été adoptée à titre légal par tous les gouvernements signataires de la Convention sur la Diversité Biologique. Tout en présentant une série d'objectifs précis, la SMCP apporte un cadre d'actions pour mettre en avant la conservation du végétal, son usage durable, le partage des bénéfices et la capitalisation de compétences au niveau régional, national et local, avec l'objectif ultime de stopper la perte de diversité végétale.

L'objectif 14 de la stratégie implique de « Promouvoir l'éducation et la sensibilisation du public à la diversité végétale. L'importance de la diversité végétale et la nécessité de sa conservation intégrée aux programmes de communication, d'éducation et de sensibilisation du public ». Le Botanic Gardens Conservation International (BGCI) est l'organisation meneuse de l'objectif 14 et a travaillé par le biais de consultations afin de produire des objectifs et des étapes pour son accomplissement. Les animateurs des jardins botaniques sont les principaux acteurs dans le domaine de l'éducation à la biodiversité et le BGCI tient beaucoup à leurs contributions.

Resumen

Las plantas son parte de la biodiversidad mundial y una fuente esencial de recursos para el ser humano. Sin embargo, a pesar de nuestra dependencia de ellas, se ha alcanzado un punto crucial –se cree que entre 60,000-100,000 especies de plantas están amenazadas a nivel mundial.

En el año de 2002, se adoptó legalmente la Estrategia Mundial para la Conservación de Especies Vegetales (GSPC) por todos los gobiernos que firmaron el Convenio sobre la

Diversidad. Usando un conjunto claro de metas, la GSPC provee una estructura para las acciones a desarrollar referente a la conservación de las plantas, uso sustentable, repartición de beneficios y capacidad de construcción a nivel global, regional, nacional, y local, con el objetivo de detener la pérdida de la diversidad de plantas.

El objetivo 14 de la estrategia involucra la 'Promoción de la educación y alerta pública acerca de la diversidad de las plantas: La importancia de diversidad de plantas y la necesidad para su conservación incorporada en los programas de la comunicación, educación y alerta publica'. La BGCI (Botanic Gardens Conservation International), es la organización líder para la meta 14 y ha estado trabajando en consultas para producir tareas y metas parciales para su alcance. Los educadores en Jardines Botánicos son los mayores interesados dentro del campo de educación y la BGCI esta dispuesta a ganar su contribución.

Sarah Kneebone is the Education Officer at BGCI, Descanso House, 199 Kew Road, Richmond, Surrey, Tel: +44 (0) 20 8332 5954. Email: sarah.kneebone@bgci.org. Website: www.bgci.org

Details of the Strategy can be found at: www.bgci.org/conservation/strategy.html



Resources

Resources

Martin-Mehers, G., Calvo, S., Auchincloss, E., and Goldstein, W. (eds.), 2004, Achieving Environmental Objectives: The role and value of Communication, Education, Participation and Awareness (CEPA) in Conventions and Agreements in Europe. Commission on Education and Communication, IUCN, Gland, Switzerland and Cambridge, UK. ISBN: 2-8317-0843-5

This publication looks at how the tools of CEPA can be used to support the implementation of multi-lateral environmental agreements such as the UN Framework Convention on Climate Change, the Convention on Biological Diversity, and the Ramsar Wetlands Convention. Part one provides a brief overview of CEPA provisions within the various Conventions while part two and three look at case studies from a national and local perspective. The case studies will be of particular interest to botanic garden educators as they provide practical examples and highlight the value of CEPA in managing change for conservation and sustainable development. The conclusion draws together a number of useful principles and guidelines for CEPA.

Simms, A., Magrath, J. and Reid, H. (2004). Up In Smoke: Threats from, and responses to, the impact of global warming on human development. New Economics Foundation, U.K. ISBN: 1 899407 92 8. Price £10.

Disponible

Martin-Mehers, G., Calvo, S., Auchincloss, E., and Goldstein, W. (eds.), 2004, Atteindre les objectifs de la Protection de l'Environnement : le rôle et la valeur de la CESP (Communication, Education, Sensibilisation du Public) pour l'implémentation des conventions et des accords en Europe. Commission on Education and Communication, IUCN, Gland, Switzerland and Cambridge, UK. ISBN: 2-8317-0843-5

Cette publication analyse la façon dont la CESP fonctionne comme outil d'aide à l'implémentation des accords multilatéraux sur l'environnement comme la Convention sur le Changement Climatique, la Convention sur la Biodiversité et la Convention Ramsar sur les zones humides. La première partie constitue une brève revue des mesures de la CESP préconisées au sein des différentes Conventions. La seconde et la troisième partie proposent des études de cas avec une perspective nationale et locale. Les études de cas sont particulièrement intéressantes pour les animateurs des Jardins Botaniques car elles proposent des exemples pratiques et soulignent la valeur de la CESP pour la gestion des changements en faveur de la protection de l'environnement et du développement durable. Les conclusions constituent un ensemble de lignes directrices et de principes utiles pour la CESP.

Recursos

Martin-Mehers, G., Calvo, S., Auchincloss, E., and Goldstein, W. (eds.), 2004 Cumpliendo Objetivos Medioambientales: Papel y valor de la Comunicación, Educación, Participación y Autoconciencia (CEPA) en Convenciones y Acuerdos en Europa. Comisión de Educación y Comunicación, UICN, Gland, Suiza y Cambridge, GB. ISBN: 2-8317-0843-5

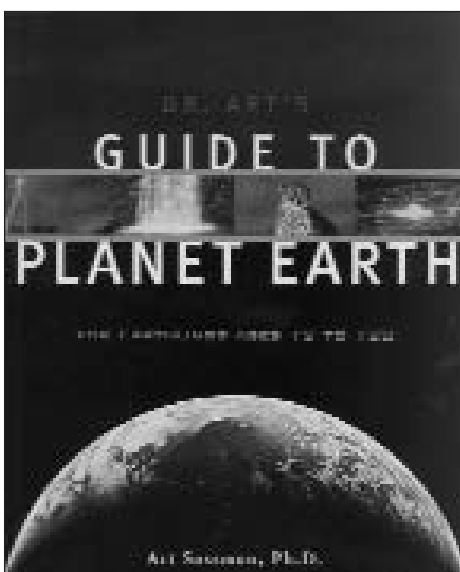
Esta publicación contempla cómo las herramientas del CEPA pueden ser usadas para apoyar la implementación de acuerdos multilaterales tales como el Convenio Marco de Naciones Unidas sobre Cambio Climático, la Convención sobre Biodiversidad y la Convención sobre Humedales de Ramsar. La primera parte proporciona un breve relato de las aportaciones del CEPA en varias Convenciones, y la segunda y tercera ejemplos concretos desde la perspectiva local y nacional. Los ejemplos serán de especial interés para los educadores de jardines botánicos ya que resaltan el valor del CEPA en la gestión del cambio hacia el desarrollo sostenible y la conservación. Concluye con un conjunto de muy útiles principios y orientaciones guía para el CEPA.

Simms, A., Magrath, J., and Reid, H. (2004). ¿Con el agua hasta el cuello?: Amenazas y respuestas al impacto del calentamiento global sobre el desarrollo humano. New Economics Foundation, R.U. ISBN: 1 899407 92 8. Precio £10.

This report has been compiled by leading environmental and development organizations across the world. It delivers a range of insights into what is at threat from climate change and what we might be able to do to avert these threats. The report looks at the impacts of global warming on food, water, health, energy, disasters, environment and livelihoods from the perspective of vulnerable people. On a global scale, it examines issues such as why women suffer most from climate change, trade and climate and environmental refugees. The report is persuasive in the need to develop community education and awareness programmes. It also provides an excellent source of information for botanic gardens for raising public awareness about climate change. Available to download in English, French, Spanish and Portuguese at: http://www.neweconomics.org/gen/z_sys_PublicationDetail.aspx?pid=199

Sussman, A. (2000), Dr Art's Guide to Planet Earth. Chelsea Green, ISBN 1-890132-73-X.

This beautifully presented and colourful book covers the three major cycles of the global ecosystem: matter, energy and life. Suitable for children aged 12 and above, the book is also a fascinating read for adults. Dr Art's Guide to Planet Earth leads readers through the basis of life on earth, examines environmental issues, including extinctions, climate change and the ozone layer. It helps answer



Simms, A., Magrath, J., et Reid, H. (2004) SOS PLANÈTE ! Menaces et réponses liées à l'impact du réchauffement planétaire sur le développement humain. New Economics Foundation, R.U. ISBN: 1 899407 92 8. Prix £10.

Ce rapport a été compilé par des organisations du monde entier, leaders dans le domaine de l'environnement et du développement. Il fournit un ensemble de réflexions sur les dangers dus au réchauffement de la planète ainsi que sur les possibilités d'éviter et de traiter ces dangers. Le rapport analyse les impacts du réchauffement global sur la nourriture, l'eau, la santé, l'énergie, les catastrophes, l'environnement et les moyens d'existence des populations vulnérables. A une échelle mondiale, il examine des questions comme celle des réfugiés victimes de la dégradation de l'environnement, les échanges commerciaux et le climat, et pourquoi les femmes sont plus vulnérables au changement climatique. Ce rapport est convaincant quant au besoin de développer des programmes d'éducation à l'environnement pour le public. C'est également une excellente source d'informations à l'usage des jardins botaniques pour sensibiliser public sur le changement climatique.

Téléchargeable en français à partir de : http://www.neweconomics.org/gen/z_sys_PublicationDetail.aspx?pid=199

Sussman, A. (2000), Le Guide de notre planète du Dr Art, Chelsea Green, ISBN 1-890132-73-X.

Ce livre joliment présenté et très coloré présente les trois cycles majeurs de l'écosystème planétaire : matière, énergie, et vie. Accessible aux enfants à partir de 12 ans, ce livre est également un régal pour les adultes. Il guide le lecteur à la découverte des bases de la vie sur terre, des problématiques environnementales comme les extinctions des espèces, les changements climatiques et la couche d'ozone. Il aide à répondre aux questions les plus importantes du 21^{ème} siècle : pouvons-nous tous bien vivre sur notre planète sans en détruire tout l'écosystème? Cette référence très conviviale est un outil pour les enseignants, il est également

Este informe ha sido recopilado gracias a las principales organizaciones mundiales para el desarrollo y el medioambiente. Aporta una serie de ejemplos ilustrativos sobre la amenaza que supone el cambio climático y cómo prevenir los riesgos. El informe contempla el impacto del calentamiento global en los alimentos, agua, salud, energía, desastres, medioambiente y medios de vida desde la perspectiva de la población más vulnerable. A escala global examina asuntos tales como el mayor sufrimiento de las mujeres con el cambio climático. Es convincente en la necesidad de desarrollar programas de educación comunitaria y concienciación. Proporciona una excelente fuente de información para que los jardines botánicos puedan despertar la conciencia pública sobre el cambio climático.

Disponible en Español en: http://www.neweconomics.org/gen/z_sys_PublicationDetail.aspx?pid=199

Sussman, A. (2000), Dr Art Guía del Planeta Tierra. Chelsea Green, ISBN 1-890132-73-X.

Bellamente presentado, este colorido libro cubre tres de los grandes ciclos del ecosistema mundial: materia, energía y vida. Apropiado para niños desde los 12 años, es fascinante para adultos. Dr Art Guía del Planeta Tierra conduce a los lectores a través de los pilares de la vida en la tierra, examina los temas medioambientales, incluyendo extinciones, cambio climático y la capa de ozono. Ayuda a contestar una de las importantes preguntas del siglo XXI: ¿Podremos vivir en el planeta sin dañar irreversiblemente la Tierra?. Esta referencia y recurso didáctico es muy fácil de usar y se complementa con el portal, www.planetguide.net, el cual incluye ideas para actividades, planificaciones de lecciones y animaciones para ilustrar aspectos clave del libro.

UNESCO-MAB (2001, 2003). Paquete educativo para combatir la desertificación. División de ciencias ecológicas, 1 Rue Miollis, 75352, Paris 07 SP, Francia. Fax: (33) 1 45 68 58 04. www.unesco.org/publications. Precio 30 euros o 30 dólares.

one of the most important questions of the twenty-first century: Can all of us live well on our planet without damaging the whole Earth system? This very user-friendly reference and teaching tool is also complemented by a website, www.planetguide.net, which includes ideas for activities, lesson plans and animations to further illustrate key points within the book.

UNESCO - MAB (2001, 2003), Education Kit on Combating Desertification
Division of Ecological Sciences
1, rue Miollis, 75352 Paris 07 SP, France.
Fax: (33) 1 45 68 58 04.
www.unesco.org/publications.
Price 30 Euros or 30 US Dollars.

Available in Arabic, English, French, Russian and Spanish; a Chinese edition will be available soon.

This kit includes a teacher's guide, a series of case studies, a children's cartoon story book and a poster. Targeted at educators and pupils during their final years at primary school, it aims to clarify scientific knowledge on desertification. Solutions and progress made to combat this crisis are also identified. The teacher's guide provides good background material and useful ideas for educational activities while the cartoon story book and map are brightly designed for children. This is an invaluable resource for educators wanting to develop a programme on this topic.

Websites

http://www.ramsar.org/outreach_wetlandcentres.htm

The Ramsar Convention on wetlands CEPA programme – Wetland Education Centres

Wetland Education Centres have a parallel role to that of botanic garden education - raising awareness of the functions and values of wetlands within the general public and school groups, as well as emphasising the role of all citizens in conserving wetlands. This website, in English, French and Spanish contains useful information about the Wetland Link International (WLI) network,

completé par un site internet www.planetguide.net qui propose des idées d'activités, de leçons et d'animations pour illustrer des points clés du livre.

UNESCO - MAB (2001, 2003), Un kit pédagogique sur la lutte contre la désertification. Division of Ecological Sciences
1, rue Miollis, 75352 Paris 07 SP, France.
Fax: (33) 1 45 68 58 04.
www.unesco.org/publications. Prix 30 Euros ou 30 Dollars US.
Disponible en anglais, arabe, espagnol, français et russe. Une version en chinois sera bientôt disponible.

Ce kit comprend un guide de l'enseignant, une série d'études de cas, une bande dessinée pour les enfants et une affiche. A l'intention des éducateurs et des enfants de fin de primaire, il a pour objectif de présenter les connaissances scientifiques sur la désertification. Des solutions et les progrès faits dans la lutte contre ce fléau sont aussi identifiés. Le guide de l'enseignant fournit de bons éléments de base et des idées utiles pour des activités pédagogiques, tandis que la BD et la carte sont brillamment conçus pour les enfants. C'est un outil essentiel pour les éducateurs souhaitant développer un projet sur ce sujet.

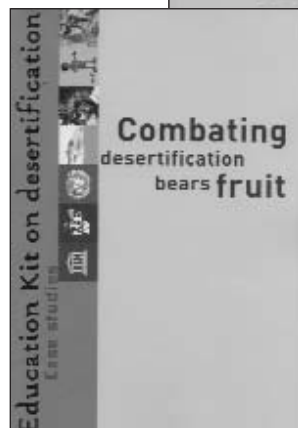
Sites Internet

www.ramsar.org/outreach_wetlandcentres.htm

Le programme de CESP de la Convention sur les Zones Humides de RAMSAR – les centres d'éducation aux zones humides

Les centres d'éducation aux zones humides ont un rôle parallèle à celui des services éducatifs des jardins botaniques – de sensibiliser le grand public et les groupes de scolaires à l'importance et aux fonctions des zones humides, ainsi que de souligner le rôle de chaque citoyen pour les sauvegarder.

Ce site Internet, en anglais, espagnol et français contient des informations utiles sur le réseau du Wetland Link



Disponible en Árabe, Inglés, francés, ruso y español. La edición en chino estará disponible próximamente. El paquete incluye una guía para maestros, una serie de estudios de caso, un libro ilustrado con caricaturas para niños y un cartel. Está enfocado para maestros y niños de

los últimos grados de educación primaria y su objetivo es brindar información científica sobre el problema de desertificación. Se identifican algunos casos de solución a esta problemática y se identifican los avances para combatir esta situación crítica. La guía para maestros proporciona un buen material de consulta, ideas muy útiles y actividades educativas. El libro para niños y el cartel (mapa) están brillantemente diseñados para niños. Este es un recurso muy valioso para educadores que desean incorporar y desarrollar este tópico en sus programas.

Websites

http://www.ramsar.org/outreach_wetlandcentres.htm

La convención Ramsar de humedales y el programa CEPA-Centros de educación de humedales.

Los Centros de Educación de Humedales juegan un papel paralelo a los jardines botánicos: aumentar la toma de conciencia en el público general y entre los escolares, sobre el valor y las funciones de los humedales. Enfatiza también en el papel de los ciudadanos en la conservación de los humedales. Este sitio web en inglés, francés y español contiene información muy útil de la Red Internacional de Humedales (WLI, por sus siglas en

set up through the Ramsar convention's CEPA programme. It provides an interesting model for the successful workings of a convention CEPA output, links to member organisations and the WLI website.

www.biodiv.org

Convention on Biological Diversity

This website provides a good entry into the CBD and its workings. The website hosts the Communication, Education, Participation and Public Awareness (CEPA) portal which provides a resource for practitioners while also acting as a reporting tool for the work of the Parties in CEPA. Also included is a database of Case Studies and Best Practices relating to the Global Initiative on CEPA and a browseable list of useful web sites.

International legislation document

International Agenda for Botanic Gardens in Conservation

Wyse Jackson, P.S. & Sutherland, L.A. (2000), Botanic Gardens Conservation International, U.K. ISBN 0 9520275 93

The International Agenda is a global policy framework for botanic gardens worldwide to contribute to biodiversity conservation, particularly as it relates to the implementation of the Convention on Biological Diversity. Your garden can sign up to register its support for the International Agenda by logging on to www.bgci.org/policies/international_agenda.html. The International Agenda and registration leaflet can also be downloaded from this site. If you would like to order a hardcopy contact BGCI at info@bgci.org or log on to BGCI's publications page www.bgci.org/policies/bgci_publications.html. The International Agenda for Botanic Gardens in Conservation is available in English, French, Spanish, Portuguese, Russian and Latvian. It can also be accessed from the CD Rom 'Plants for the Planet: Resources for Botanic Gardens', included with this issue of Roots.

International (WLI), mis en place grâce au programme CESP de la convention de Ramsar. Il fournit un exemple intéressant de mise en application réussie d'une résolution CESP, et fournit des liens vers les organisations membres et vers le site du WLI.

www.biodiv.org

La Convention sur la Diversité Biologique

Ce site Internet est une bonne introduction à la CDB et à son fonctionnement. Le site accueille également le portail de CESP (Communication, Education, Sensibilisation du Public) qui propose des ressources pour les acteurs de terrain, tout en servant d'outil pour les rapports de travail des membres de CESP. Il y a une base de donnée des Cas d'Etudes et Meilleures Pratiques en relation avec l'initiative mondiale CESP, et une liste des sites Internet.

Document de législation internationale

L'Agenda International pour la conservation dans les Jardins Botaniques

L'Agenda International est un cadre mondial de politique pour les jardins botaniques du monde, pour contribuer à la conservation de la biodiversité, en particulier parce qu'il se réfère à la mise en place de la CDB. Votre jardin peut s'inscrire pour afficher son soutien à l'Agenda International en allant sur le site www.bgci.org/policies/international_agenda.html. L'Agenda International et une fiche d'inscription peuvent y être téléchargés. Si vous voulez commander une version papier, contactez le BGCI par courriel (info@bgci.org) ou allez sur le site des publications du BGCI www.bgci.org/policies/bgci_publications.html. L'Agenda International pour la conservation dans les Jardins Botaniques est disponible en anglais, espagnol, français, letton, portugais et russe. Il est également inclus sur le CD-Rom «Plants for the Planet: Resources for Botanic Gardens », fourni avec la présente édition de Roots.

inglés), creada a través del programa CEPA (Comunicación, Educación, Participación y Concientización) de la Convención Ramsar. Provee un interesante modelo sobre trabajos exitosos del programa CEPA de la convención, así como enlaces a otras organizaciones miembros de la convención y al sitio web WLI.

www.biodiv.org

El Convenio sobre la Diversidad Biológica

Este sitio aporta un buen acercamiento a la convención y su trabajo. En este sitio está el portal CEPA (Comunicación, Educación, Participación y Concientización Pública). De particular interés para quienes tienen programas prácticos ya que también es una herramienta para reportar el trabajo de quienes forman parte del programa CEPA. De interés es la base de datos de estudios de caso de las mejores prácticas relacionadas con la iniciativa global CEPA así como una lista de sitios web.

Documento internazionale de legislación

Agenda Internacional para la Conservación en Jardines Botánicos

La Agenda Internacional es un marco político global para la contribución de los jardines botánicos del mundo a la conservación de la biodiversidad, relacionada en particular con la Convención de Diversidad Biológica. Ud. puede registrar el apoyo de su jardín botánico a la Agenda Internacional entrando a la página www.bgci.org/policies/international_agenda.html. La Agenda Internacional y el folleto de registro también se pueden bajar en este sitio. Si desea el material impreso puede solicitar una copia en BGCI en info@bgci.org o directamente en la página de BGCI en la página de publicaciones www.bgci.org/policies/bgci_publications.html. La Agenda Internacional para la Conservación en Jardines Botánicos está disponible en inglés, francés, español, portugués, ruso y latvio. También se puede acceder a la Agenda en el CD Rom "Plantas para el planeta: recursos para jardines botánicos", el cual se incluye en el presente número de Roots.

How to join Botanic Gardens Conservation International

The mission of BGCI is to build a world network for plant conservation. It was founded in 1987 and now includes over 525 member institutions in 115 countries, working together to implement the *International Agenda for Botanic Gardens in Conservation* and the new *Global Strategy for Plant Conservation*.

Institutions can join BGCI for the following benefits:

- Membership of the worldwide plant conservation network
- Botanic Garden Management Resource Pack (upon joining)*
- Regular publications:
 - the regular newsletter, *Cuttings*
 - *BGjournal* – an international journal for botanic gardens (2 per year)
 - *Roots* - environmental education review (2 per year)
 - A wide range of new publications
- Invitations to BGCI congresses and discounts on registration fees
- BGCI technical support and advisory services

Institution Membership		£ Stlg	US \$	£ Euros
A	BGCI Patron Institution	5000	7500	7500
B	Institution member (budget more than US\$2,250,000)	600	940	940
C	Institution member (budget US\$ 1,500,000 - 2,250,000)	440	660	660
D	Institution member (budget US\$ 750,000 - 1,500,000)	300	440	440
E	Institution member (budget US\$ 100,000 - 750,000)	160	220	220
F	Institution member (budget below US\$100,000)*	75	110	110
*Generally applies to institutions in less developed countries				

Other Membership Categories:

Membership benefits depend on category - see below. These can include:

- Regular publications:
 - the regular newsletter, *Cuttings*
 - *BGjournal* - an international journal for botanic gardens (2 per year)
 - *Roots* - Environmental Education Review (2 per year)
- Invitations to BGCI congress and discounts on registration fees

Corporate Membership		£ Stlg	US \$	£ Euros
G	Corporate Gold Member (<i>BGjournal</i> , <i>Roots</i> and <i>Cuttings</i> plus more)	5000	7500	7500
H	Corporate Silver Member (<i>BGjournal</i> , <i>Roots</i> and <i>Cuttings</i> plus more)	1000	1500	1500
Individual Membership		£ Stlg	US \$	£ Euros
J	Conservation donor (<i>BGjournal</i> , <i>Roots</i> and <i>Cuttings</i> plus more)	160	220	220
K	Associate member (<i>Cuttings</i> and <i>BGjournal</i>)	35	50	50
L	Associate member (<i>Cuttings</i> and <i>Roots</i>)	35	50	50
M	Friend (<i>Cuttings</i>) available through online subscription only (www.bgci.org)	10	15	15

*Contents of the Botanic Garden Management Resource Pack: *The Darwin Technical Manual for Botanic Gardens*, *A Handbook for Botanic Gardens on the Reintroduction of Plants to the Wild*, *A CITES Manual for botanic gardens*, *BGjournal* - an international journal for botanic gardens (2 past issues), *Roots* - environmental education review (2 past issues), *The International Agenda for Botanic Gardens in Conservation*, *Global Strategy for Plant Conservation*, *Environmental Education in Botanic Gardens*, *BG-Recorder* (a computer software package for plant records).

Payment may be made by cheque payable to Botanic Gardens Conservation International, or online at www.bgci.org or by VISA/Mastercard sent to BGCI, Descanso House, 199 Kew Road, Richmond, Surrey, TW9 3BW, U.K or Fax: +44 (0) 20 8332 5956.

I wish to apply for membership of Botanic Gardens Conservation International.

Name

Telephone

Address

.....

Fax

E-mail

Internet site

Membership category Annual rate

VISA/Mastercard number Credit card expiry date

Signature Print name

I would like to make a donation to BGCI. Amount

Please clearly state your name (or the name of your institution) on all documentation. Please contact info@bgci.org for further information.

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BGCI

Plants for the Planet

**Botanic Gardens
Conservation International**

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Invitation to BGCI's 6th International Congress on **Education in Botanic Gardens**



BGCI

The University of Oxford Botanic Garden, UK

10th–14th September 2006

ACHIEVING SUSTAINABILITY: IDEAS AND SOLUTIONS
PUBLIC AWARENESS OF PLANTS
REFLECTION ON PRACTICE
EDUCATION FOR ALL: WORKING WITH CHALLENGING AUDIENCES
THE UNIVERSITY OF OXFORD BOTANIC GARDEN
THE NATURE OF SUCCESS
SUCCESS FOR NATURE

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To register your interest in the congress visit
www.bgci.org/educationcongress

