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International collaboration

Botanic garden partnerships for conservation

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Plants for the Planet

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EDITORIAL:
Valuing partnerships and collaboration

The need for botanic gardens to increase their efforts in conservation, acting individually and collectively, grows ever more important. The role of botanic gardens and BGCI in this regard was fully recognised at the 10th Conference of the Parties of the CBD held in Nagoya, Japan in October 2010. I am delighted that a revised and updated Global Strategy for Plant Conservation was agreed at this meeting with ambitious targets for 2020. Thank you to all who have supported the development of the new GSPC in so many ways. The new targets are included in this issue of BGjournal and BGCI is committed to supporting the GSPC as one of our core activities. Making a strong rationale for biodiversity conservation remains vitally important - in a language that will be widely understood in society. The TEEB report presented at the CBD meeting presents the economic case – we have also featured this in BGjournal and I hope that you will find this of interest.

In this issue of BGjournal we focus on international partnerships amongst botanic gardens and between botanic gardens and other institutions working towards biodiversity conservation goals. At a time when financial resources are limited working together can, of course, help to overcome common constraints in delivering research, training, education and action for conservation.

The partnerships between botanic gardens build on a tradition dating back well over a hundred years, as noted by Professor Stephen Blackmore of the Royal Botanic Gardens, Edinburgh and may be based on historic linkages, community relationships or the sharing of specialised skill sets. As highlighted in the article by Barnabas Seyler and Robert Lyons, personal contacts and friendships facilitate and underpin such partnerships. Given that the majority of botanic gardens around the world are not located in areas of high biological diversity, north-south partnerships are particularly important in helping to build conservation capacity where this is most needed and in the sharing of floristic expertise. Botanic gardens such as the Conservatory and Botanic Garden of the City of Geneva provide inspiring examples of how the skills and technical knowledge of botanic gardens in the north can be used to support conservation and education projects in the south. Other examples included in this issue are the partnerships between North Carolina Zoo in the USA and Tooro Botanic Garden in Uganda and linkages between francophone gardens in Europe and Africa.

BGCI continues to foster collaboration at an international level and new emerging partnerships develop for example from workshops and training courses. A BGCI workshop organised in Georgia in May 2009 has recently resulted in developing working links between the botanic gardens of Tblisi and Brooklyn, focusing on community outreach and education.

BGCI Congresses are a major way in which botanic gardens can share experiences and develop joint projects and partnerships. The proceedings of the highly successful Dublin Congress are available on the BGCI website to remind us of the warm days in Dublin. We are pleased to announce that the 8th International Congress on Education in Botanic Gardens will be held in Mexico City in 2012 – Spanish lessons are taking place in the BGCI office in preparation for this. The 5th Global Botanic Gardens Congress will be held in Dunedin, New Zealand in 2013. Before then I hope that existing partnerships continue to flourish and that new ones will be formed as we work together to ensure the ongoing success of the GSPC.

Happy New Year!

Sara Oldfield

Sara Oldfield
Secretary General, BGCI

Author: Stephen Blackmore

GROWING TOGETHER: PARTNERSHIPS FOR PLANTS AND PEOPLE IN CHINA

Botanists have benefited from the linkages between RBG Edinburgh and China for over 100 years.

David Rae, Sara Oldfield and Xu Kun climbing the Jade Dragon Snow Mountain

Introduction

The Royal Botanic Garden Edinburgh (RBGE) has a long tradition of engagement and collaboration in China. Historically, there have been three distinct phases to this connection, the first of which involved a one way flow of plants and information to Europe. Happily, the subsequent chapters benefitted both countries and built the foundations for present day partnerships. Today, RBGE enjoys close collaboration with the family of botanic gardens supported by the Chinese Academy of Sciences and has an especially close relationship with the Kunming Institute of Botany (KIB), with which it is twinned.

Building the partnerships

The roots of this relationship date back over a century to a period when RBGE began receiving herbarium specimens from the Muséum National d'Histoire Naturelle in Paris collected by French Missionaries working in China. These European pioneers included such notable people as Jean Pierre Armand David, Jean Marie Delavay, and Jean Andre Soulié. Many of the new plant species they discovered and sent back to Monsigneur Léveillé in Paris were first described by Adrien René Franchet who, in the 1880s and 1890s, arranged for duplicate specimens to be sent to the herbarium in Edinburgh. The riches of this new temperate flora, hitherto unknown in the West, inspired a number of plant collectors to explore western China in the early part of the twentieth century. For RBGE, the most important of these was George Forrest, who made seven expeditions to China between 1904 and 1932 and sent back seed of numerous species and over 30,000 herbarium specimens. At the time when Forrest was travelling in Western China there was no local herbarium to receive a set of his specimens, so it was pleasing when the Royal Horticultural Society provided a set to KIB a few years ago. Edinburgh began to establish itself as a centre of excellence in the plants of China as Forrest's explorations

Collecting sediment cores

progressed under the directorship of Sir Isaac Bayley Balfour, Regius Keeper. This led other pioneering collectors to bequeath archival materials to RBGE including the dairies of Joseph Rock and papers from Reginald Farrer. Taken together, the herbarium, archives and living collections at RBGE are a major source of information for scholars of Chinese botany.

"Thanks to the efforts of pioneering botanists, Edinburgh has become a centre of excellence in the plants of China."

Picea likiangensis *in the Lijiang Alpine Garden*

Early visitors to Edinburgh

Their importance led to the second chapter in the story of relations between RBGE and China which was represented by Chinese scientists visiting Edinburgh to pursue their education and research. One of the most important of these visitors was Chen Fenghuai who came to Edinburgh in 1933 and subsequently became known as "the Father of Chinese Botanic Gardens". He was instrumental in establishing the South China, Wuhan, Lushan and Sun Yat-sen Botanical Gardens. Soon afterwards, from 1936 to 1938, Fang Weipen came to Edinburgh to study rhododendrons with Sir William Wright Smith. Wright Smith had been an assistant to Isaac Bayley Balfour and succeeded him as

Jade Dragon Snow Mountain

Regius Keeper in 1922. He himself had travelled widely, serving as the Director of the Botanical Survey of India and collecting Himalayan plants in Sikkim, Nepal and Tibet. After returning to China, Fang Weipen became the Director of the Sichuan University Herbarium in Chengdu. From 1947 to 1950, Yü Tsetsun, who had travelled and collected plants widely in Yunnan, came to work with Wright Smith in Edinburgh. After returning to the Institute of Botany in Beijing, he continued to send seed of wild plants to Edinburgh and many of his introductions are thriving today. A personal favourite of mine is a fine specimen of *Pinus armandii* which inhabits a peaceful spot away from any of the major paths through the garden. For many years after the founding of the People's Republic of China in 1949 contact and communications between China and the wider world were limited. Fortunately in the 1980s, when the political reforms that started under the leadership of Deng Xiaoping led to the redevelopment of scientific and political links between China and the West, the third chapter in the relationship began.

Collaboration today

A key figure in ushering in the latest chapter of collaboration was Professor Wu Zhengyi who in 1981 facilitated the Sino-British Expedition to China, the first by Western botanists since 1947. This expedition marked an important turning point, because the herbarium specimens it generated came back with the names of both Chinese and British botanists on their labels. The area visited by the expedition, in Yunnan Province, centred on the Cang Shan mountain range near Dali, an area well known to George Forrest in his day. One of the Chinese members of the team was Fang Mingyuen, the son of Fang Wenpei who had worked with Edinburgh botanists forty five years earlier. Wu Zhengyi is one of China's most celebrated scientists. Now in his 94th year, and a Fellow of the Chinese Academy of Science, he was awarded China's highest scientific award, the State Preeminent Science and Technology Award by President Hu Jintao in 2007.

RBG Edinburgh and local staff at the Jade Dragon Field Station

The Jade Dragon Field Station

Together with Peter Raven of Missouri Botanical Garden he launched the amazingly ambitious Flora of China project, which is now nearing completion and will provide accounts of over 31,000 species of plants. When Wu Zhengyi himself visited Edinburgh to take part in the first international committee meeting for the Flora of China project he and David Ingram, Regius Keeper, signed a twinning agreement between RBGE and the Chinese Academy of Sciences Kunming Institute of Botany (KIB). This launched a new set of collaborative projects between the two institutions. One of these, led by David Paterson, then the Deputy Director of Horticulture at RBGE, was the creation of the British Garden at the Kunming Horticultural Exposition in 1998. The British Garden was awarded one of the top prizes and the Expo site in Kunming continues to attract millions of visitors every year. The British Garden project received the energetic support of Sir Anthony Galsworthy, the British Ambassador to China and once it had been completed he was keen to support further initiatives. By now the focus of collaboration between RBGE and KIB had moved on from simply collecting plants to working together to conserve them.

At 3,800m on Jade Dragon Snow Mountain

> *"The focus now is on working together to conserve plants."*

My own first visit to China, apart from school days in Hong Kong in the 1960s, came in 2000 when together with David Paterson, Tony Galsworthy and others I visited the region around the ancient town of Lijiang. Like other parts of Yunnan, Lijiang has a rich cultural diversity, being home to several ethnic minority peoples. When Joseph Rock lived in a village near Lijiang in the 1930s he not only collected plants but studied the culture of the Naxi minority people, writing the first dictionary of their unique pictographic language. Rock lived in the shadow of the Yulong Xue Shan, or Jade Dragon Snow Mountain, an extensive

Jade Dragon Snow Mountain

mountain range reaching 5,995 metres with some of the most southerly glaciers in the northern hemisphere. The Yulong Xue Shan was also well known to George Forrest, who camped on its lower slopes and explored the highest alpine meadows of the mountain. The purpose of our visit was to identify a site for the establishment of a new botanic garden and a field station to support research and conservation projects. In the 1950s KIB had started what proved to be a short lived botanic garden not far from Joseph Rock's former residence, now a museum. The site selected for the new garden lies between Yufeng Buddhist Temple and a tourist attraction called Yue Xue Jai with flowing pools and restaurants. In May 2001 a stone laying ceremony took place at the site of the proposed garden to celebrate the launch of the project and the purchase

Celebrating the opening of the gateway to Lijiang Alpine BG

Primula sonchifolia

of the land by the Chinese Government. Whereas in Europe such a ceremony would have placed the first stone in the construction of a new building, this ceremony consisted of burying a stone engraved with calligraphy. As a living celebration of the occasion we planted a Lijiang Spruce (*Picea likiangensis*) in the lower slopes of the garden at 2,800 metres above sea level. The site we selected for the associated Jade Dragon Field Station was four hundred metres higher up the mountain, close to a small dam which provides water for some of the many rivers flowing through Lijiang. Thanks to generous sponsorship from several multinational companies investing in China and funds from the Foreign and Commonwealth Office, construction of the Field Station moved ahead rapidly. The Field Station is built in traditional Naxi architecture, around a walled courtyard and was carried out by people from the neighbouring villages. All of the materials for its construction had to be carried up the mountain by people or horses. Today, a short spur from the road constructed between Lijiang and Wen Hai village makes it possible to drive to the Field Station, which now has mains electricity and internet connection. Some of the highest glasshouses in the world, at 3,200 metres, provide facilities for the propagation and bulking up of rare plant species from the surrounding mountain. The Field Station is being used as a base for a steadily growing number of scientific research projects including my own research on the Quaternary vegetation history of the region, studies on pollination biology and on the conservation of threatened plant species.

"The vision is to develop the Lijiang Alpine Botanic Garden as a focal point for education, tourism and the conservation of alpine plants under China's biodiversity action plan."

In recent years the warm relationship between KIB and RBGE has led to new relationships with botanists at a range of institutes in China including the Institute of Botany in Beijing, the South China Botanic Garden and the Guanxi Botanical Garden of Medicinal Plants. The latter is funded by the Chinese Academy of Medicinal Sciences and is working to design and create a small garden of Chinese traditional medicine plants at RBGE. Working in China has given me the opportunity to visit many other botanic gardens there and to observe how each of them is moving ahead rapidly with support and investment from the Chinese Government. There is little doubt that the sheer scale and rapidity of this investment means that China must be regarded as one of the leading nations of the word when it comes to the development of botanic gardens as centres of excellence in research, conservation and education. As international participants at the 3rd Global Botanic Gardens Congress saw in Wuhan a few years ago, China's botanic gardens mean business – they are expanding purposefully and it is going to be exciting to see their achievements in the years ahead.

All images: Stephen Blackmore

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View of Jade Dragon Snow Mountain from Lijiang

Authors: Didier Roguet and Pierre-André Loizeau

RESPONSIBILITY AND COOPERATION:

THE EDUCATIONAL COOPERATION POLICY OF THE CONSERVATORY AND BOTANICAL GARDEN OF THE CITY OF GENEVA (CJB), SWITZERLAND, WITH SOUTHERN-HEMISPHERE COUNTRIES

The CJB has developed a cooperation policy based on education in applied ethnobotany and conservation.

Secondary school children visiting the botanic garden in Senegal

AEPY Medicinal gardens in Asuncion, Paraguay

> *"We believe it is a responsibility of botanical gardens in the northern hemisphere to cooperate with those in the southern hemisphere in their geographical field of floristic expertise."*

Introduction

The Conservatory and Botanical Garden of the City of Geneva (CJB) is an institution with a great international reputation, and is also the living museum of the City of Geneva. Like most established botanic gardens, it is in the northern hemisphere, outside the belt of tropical biodiversity that encircles the planet. Unfortunately, there is no correlation between the geographical distribution of botanic gardens around the world and the areas of maximum natural and cultural diversities. This situation stems from the history of botanic gardens and above all the extremely unfavourable economic situation in the countries that are home to the tropical forests, which contain 80% of the world's biodiversity.

One of the crucial missions of botanic gardens at the beginning of the 21st century is to try to check the dramatic loss of plant diversity that is occurring. The original 2010 objectives set by the Global Strategy for Plant Conservation (GSPC) have not been achieved in this International Year of Biodiversity, although revised targets for the next ten years have been adopted. This is despite the considerable sums of money that are being devoted to the protection and

conservation of environments and species. Although it appears that the overall number of species living on Earth has been underestimated, we are continuing to lose numerous species daily, in particular in the intertropical zone.

Teams of scientists and botanical gardeners at the CJB in Geneva and many other botanical research institutions around the world are working to record, classify, conserve, reproduce and cultivate plant species, and our specialist educators, writers, botanical editors, and database administrators are informing, educating and publishing papers devoted to this conservation work. However, despite this great effort, the loss of natural and cultural plant diversity appears to be inexorable.

Deforestation in Paraguay

The CJB's cooperation policy

For more than 10 years the CJB has been attempting in a modest way to provide practical solutions to the very negative state of affairs described above, through a concerted cooperative policy of applied ethnobotany and targeted environmental education. This has taken the form of educational micro-projects set up in those tropical areas where we have floristic expertise (mainly South America and Africa). These projects, based on principles of sustainable development, must fulfil certain conditions and prerequisites if they are to be implemented by us:

- the CJB must have floristic expertise in the geographical area concerned;
- the project must be a local request coming from a municipality, government organisation or local association or club;
- it must be politically and academically approved locally;
- it must involve funding of less than $30,000 per year, if possible shared with a local body or complemented by it;
- it must include the setting up of an environmental education centre (EEC) in the form of some kind of garden open to the public (and if possible frequented) near a large town or city;
- ethnobotanical gardens must be created next to the above EEC;
- the project must be scientifically inspected and approved by a competent local academic authority and/or the CJB;

Campotech meeting in Paraguay

- a clear timetable must be established for implementation of the three S's (self-determination, self-management and self-sufficiency).

"The objective of these projects is to improve the ability of southern-hemisphere botanical gardens to respond to the wholesale loss of natural and cultural diversity."

These projects are supported financially through the CJB by the City of Geneva's Solidarity Fund and are encouraged to seek additional funding locally (local municipalities and universities, local associations and clubs, the Swiss Red Cross local office, etc.).

The CJB has developed educational cooperation projects in the following countries:

- In Bolivia, the Kusillo Ethnobotanical Gardens in La Paz, which presented the useful plants and techniques of this Andean country in an interactive museum form in relation to the relevant craft industry and fair trade. This extraordinary educational experiment was unfortunately stopped in its successful tracks by changes in the local political situation;
- In Brazil, the Municipality of Sao Paulo's project for Community Gardens of useful plants on the edge of the Api-Capivari-Monos Nature Reserve, which suffered the same political fate;
- Again in Brazil, the Ethnobotanical and Veterinary Gardens at the University of Patos in the state of Paraìba (north-eastern Brazil) are however flourishing. They are part of a project that the CJB continues to support, which aims to promote the traditional knowledge of the veterinary plants of the Caatinga (a type of vegetation typical of north-eastern Brazil). In addition to the gardens, a herbarium and library established by us support the ethno-social element of this conservation project designed to reclaim the local plant-based veterinary heritage and its applications;

Selling medicinal plants in Paraguay

Veterinary stall in Patos market, Brazil

- In the Ivory Coast, an educational programme about the protection and conservation of Adiopodoumé Forest has been developed, next to the Swiss Centre for Scientific Research. An educational manual of botanical conservation, self-managed by the inhabitants of the villages around the forest in question, has been published. It is very popular in the Ivory Coast and has won prizes in this French-speaking West African country. The manual is applicable to the entire coastal area in this part of Africa;
- In Burkina Faso, in the inner suburbs of Ouagadougou, logistical and methodological support has been given to the Bangr' Weogoo Park Educational Centre, which every day provides several visiting school groups with an introduction to environmental education (EE) in the Sahel.

In addition to these examples, we have been running two "pilot" projects, the development and objectives of which are described below.

The AEPY project in Asunción (Paraguay)

This project, the CJB's longest standing in terms of cooperation with a southern-hemisphere country, is based on the widespread traditional use of medicinal plants in Paraguayan popular culture. Used both for sweetening and flavouring maté and for treating medical complaints, medicinal plants are omnipresent in the markets of this South

Campotech meeting in Paraguay

American country. The trade provides a living for many families of gatherers, peasant farmers, street sellers and market traders. A number of laboratories and dispensaries export these plants, packaged to varying degrees, mainly to Argentina and Brazil. Paraguay is also one of the countries that have seen the highest levels of deforestation in the world in the last fifty years, largely due to forest clearance for timber and coal mining and more recently for growing GM cotton and soya, and pasture.

An ethnobotanical study carried out in the markets of Asunción in 1996 by the first author of this paper showed the richness of the local medicinal plant heritage, with more than 700 species being used in the country, 70% of which were gathered in the region. In parallel, this ethnobotanical research was used to develop an approach and a methodology for applying ethnobotany to environmental education within the framework of the Asunción Botanical Garden. This programme is governed by an agreement between the municipalities of Geneva and Asunción. It has resulted in:

- The establishment of a Medicinal Garden containing a collection of more than 500 species and varieties used in Paraguay, making it one of the finest medicinal plant collections in South America;
- The publication of numerous works, educational sheets, themed papers, brochures and books;
- Themed workshops, tours, classes and courses being offered to the general public;
- The publication of videos, programmes broadcast on local television and radio stations, themed supplements in daily newspapers and exhibitions both in the region and abroad ("Cap au Sud" in 2002 in Geneva);
- The creation of secondary collections (National University of Asunción, Patino Aregua Ethnobotanical Gardens, community gardens, cottage gardens, etc.);
- A collaboration, sponsored by the Swiss Red Cross (SRC) with 29 peasant-farmer associations concerning cultivation, domestication and reforestation with Paraguayan medicinal species, including the production of an integrated production manual;
- The creation of Campotech, at the request of the peasant-farmer associations and again in collaboration with the SRC. This is a post-school-age technical education establishment that promotes and helps create professional opportunities for adolescents by connecting them with the community and trying to prevent large-scale migration to towns and cities;
- The production in 2009 of a book, a reference work on the medicinal plants used in Paraguay which is widely distributed free of charge among groups frequenting the markets (wholesalers, retailers and gatherers) and peasant farmers. This work contains original taxonomic, ethnobotanical, phytopharmaceutical and horticultural information. It is based on the living collection at the Asunción Botanical Garden and provides a host of information on the toxicity and conservation of the species in question.

This project is currently in the process of becoming self-sufficient through a new independent intermediary association called AEPY (Asociación Ethnobotanica Paraguaya) that has been set up in Paraguay and is championing and promoting the project while seeking funding.

The CEEH project (Hann Environmental Education Centre) in Dakar, Senegal

This Senegalese project is based on the same fundamental principles as the AEPY project in Paraguay.

It is made up of several sections and an extension project:

- The Education Centre itself, which is housed in the restored former Aquarium in Hann Park, the only green space in the entire Dakar conurbation, which is expanding fast. This centre receives numerous school groups and provides an introduction into environmental topics, continuous professional development training for teachers (eco-education) and summer camps;
- The Ethnobotanical Garden, which is home to a very fine collection of Senegalese useful plants, with explanations and classified by use;
- The publication of educational sheets, an environmental education manual for the pre-Sahelian zone (co-published in the CJB's educational series) and various documents published in collaboration with the Ministries concerned (Education and Environment), including a short work for the "Tiny Tots' Hut", a decentralised visitor facility present in the villages;

- The setting up of programmes for the communities in the municipality of Hann (waste management, composting, "family kitchen gardens", environmental music festival, etc.);
- The extension project itself, which involves establishing a second Environmental Education Centre in St. Louis in northern Senegal, at the former INRA (National Agronomic Research Institute) acclimatisation garden.

Conclusion

These two examples clearly demonstrate our readiness to work in the southern hemisphere using both our floristic and ethnobotanical expertise and that of our partners to develop together socioeducational micro-projects that meet the requirements of quality sustainable development.

In our opinion, the botanical gardens in the developed countries of Europe, North America and Asia have an obvious – and often post-colonial – responsibility to collaborate and work to restore and use the gardens of the intertropical belt in developing countries. This initial collaboration should be followed by cooperation to establish a concerted ethnobotanical policy applied to environmental education.

Local tooth-picks on sale in Dakar, Senegal

Ethnobotanical gardens, Hann-Dakar, Senegal

The methodology is the same for all our projects:

1. Compilation and validation of ethnobotanical data stemming from traditional learning;
2. Promotion of the heritage value of this popular knowledge and reinforcing the self-esteem of the local populations, in particular in the disadvantaged classes;
3. Raising awareness of and engendering a process of responsibility with respect to the conservation of plant species;
4. Production of suitable teaching materials, construction of an ad-hoc mediation programme.

In the light of our accumulated experience, projects that are developing positively have socioeducational impact locally and impact in terms of environmental policy at regional level. We can surely and definitely encourage and recommend that other botanical gardens form this type of partnership with our colleagues in the southern hemisphere.

French abstract

L'article abordera la responsabilité des jardins botaniques du Nord à coopérer avec ceux du Sud dans leur domaine géographique de compétences floristiques. L'objectif de ces projets est d'améliorer la capacité de ces derniers à répondre à la perte massive de diversité naturelle et culturelle. A l'exemple des programmes menés depuis plus de 10 ans par les Conservatoire et Jardin botaniques de la Ville de Genève au Paraguay et au Sénégal, cet objectif est atteint par une politique d'éducation à l'ethnobotanique appliquée et à la conservation. Un Centre d'éducation environnementale, un jardin ethnobotanique thématique sont créés. Une politique informative et pédagogique est développée en partenariat avec les municipalités et les acteurs de la société civile locale.

Tooth-pick survey, Dakar, Senegal

All images: CJB

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PARTNERSHIPS AND COLLABORATION FOR CONSERVATION

Godfrey Ruyonga, Director TBG visiting the Kitara Forest chimpanzee exhibit at the NC Zoo (Gin Wall)

The North Carolina Zoo and the Tooro Botanical Gardens are partners in plant conservation activities in Uganda.

Introduction

Partnerships among conservation organizations, non-government organizations, botanic gardens and zoos are often critical to conserving biological diversity. The North Carolina (NC) Zoo is working with partners in NC and in Uganda, East Africa to help preserve and restore populations of rare and endangered plant species, natural communities and ecosystems.

Besides the *in situ* conservation benefit, our partnerships provide opportunities for our staff to gain field experience that broadens their vision and helps in designing unique plant and animal habitats at the NC Zoo. Ultimately, as horticulturists and educators, we combine this knowledge and these experiences with the plant species themselves into exhibits and educational programs that show the complex relationships between species.

The NC Zoo's horticulture program is defined, in part, by its collections of rare and endangered species, native species, and wild-origin, known-provenance species. The Zoo acquires most of its plants for display from suppliers who have domesticated these species from the wild, thus reducing pressure on wild populations. The NC Zoo staff's participation in natural area conservation, both locally and internationally, is important to help safeguard finite biological resources and to help ensure sources of wild genes for the future.

> *"The Zoo cannot hope to fulfill its mission to conserve biological diversity without helping institutions in the places where biological diversity exists."*

Two documents were early inspirations for the NC Zoo's international plant field conservation programs: *The International Agenda for Botanic Gardens in Conservation* (2000) and *The Global Strategy for Plant Conservation* (2002) which sets out targets aimed to safeguarde the world's plant diversity.

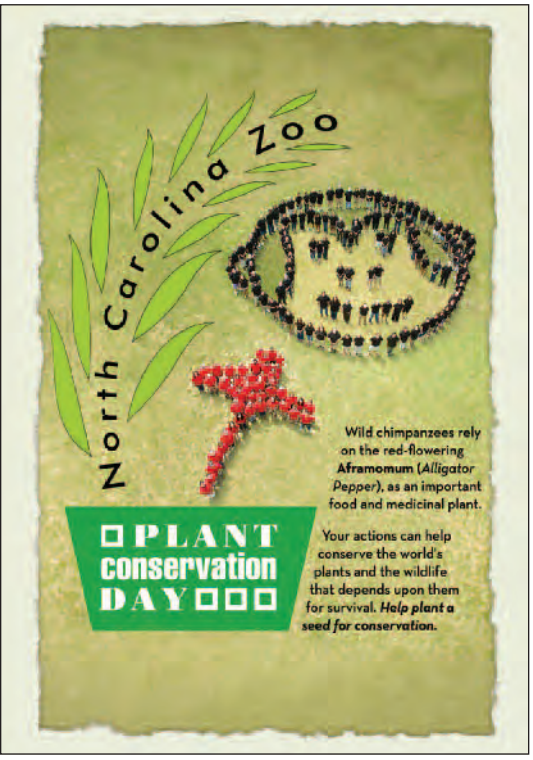
A door closes and a window opens...

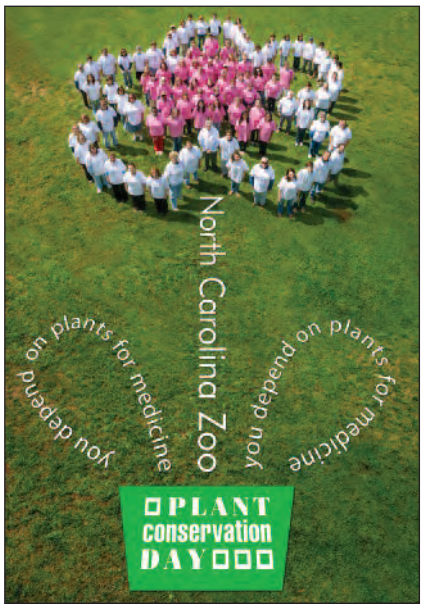
Our strategy is to locate and build on established expertise and experience in areas identified as important for biological diversity. We involve local experts and organizations in the region and help to empower communities to conserve their natural resources. The knowledge Zoo staff gain from working with indigenous organizations is a rich source of inspiration to improve NC Zoo's exhibits and interpretive storylines.

Developing partnerships is a way to extend our limited resources and we have found willing and capable partners in Africa who have similar missions and values to ours. We have found that all partners can benefit equally from a trusting relationship that incorporates "SMART" (specific, measureable, achievable, realistic and timely) goals.

> *"We have found that these partnerships work better if long term planning and participation is expected on both sides."*

Making a commitment to spend the time needed to establish relationships, define projects, and work through organizational and funding problems is critical to a successful field partnership. Other issues that must be considered include local political stability for staff safety, identifying a biologically important hotspot that is recognized by the appropriate world conservation organizations, and finding a willing partner who understands transparency and accountability of financial dealings. These are some of the more important criteria we use when making decisions about who we will approach for Zoo partnerships.





Sky Art at NC Zoo in 2009 and 2010 (Photos: Juan Villa, Graphic Art: Diane Villa)

After finishing a project in 2005 with a partner in Cameroon, West Africa, the NC Zoo was looking for new opportunities and one became available in Uganda, in the Albertine Rift, a hotspot for biodiversity in Tropical Africa. Conservation of plants in areas like the Rift is one of the targets identified by the botanic gardens of the world. One of our first challenges was identifying potential local partners. The Zoo has been working in Uganda for over 15 years on other projects, but we had not worked specifically in plant conservation before and we had to cultivate a number of new relationships.

Among the issues we often face are questions about why a zoo would be interested in conserving plants in the wild. The NC Zoo has broader interests than most field conservation organizations might expect. Zoos generally have animal focused conservation programs, and are not known for their work with plants. Animal conservation projects, however, often include studies of the habitat and plants that support animal populations.

The NC Zoo formed a partnership with Tooro Botanical Gardens to help understand and document plant diversity in the area of the Albertine Rift near Kibale Forest. The project includes working with garden staff to assist with long term strategic planning, establishing herbaria and living collections, and providing training, resources, knowledge and funds to develop a working list of the known plant species in this biologically diverse area of the world. This plant work is also an important piece in the puzzle of understanding the habitat needs for the conservation of animals in the area.

Drafting the Memorandum of Understanding to form the North Carolina Zoo/Tooro Botanical Gardens partnership in 2007 was an important first step. Subsequent letters of agreement stating clear goals, outcome measures, products and evaluations made for a good foundation. Drafting and agreeing on the garden's strategic plan helped focus the work. Face-to face meetings were important, with travel funded by the NC Zoo Society. The partnership's accomplishments are assessed each year and have been essential to furthering the collaborative work. Partnership visits occur on a regular basis and involve either Ugandan Garden staff coming to the United States or Zoo staff visiting the Garden in Uganda. In all cases Zoo staff travel is designed to assess conditions at the Garden, evaluate progress toward goals, and identify training and funding needs that are important to the next phase of the project. Besides Society funding, grants from other non-profits and fundraising events are now funding most of each year's work plan.

An important special project for the partnership is the development of the Tooro Botanical Garden's medicinal plant garden. Many plants found in the forest of the Albertine Rift have medicinal properties for humans and other animals. Medicinal plants are important to rural Ugandans because of the cost and scarcity of health care. The medicinal plant garden will include a family "first aid" garden that is intended to help Ugandans (mostly women) to understand what plants can be used to treat their families. The medicinal gardens at Tooro also propagate medicinal plants to sell to local women for their family gardens, thus reducing the pressure on the plants in the wild. Gardens of native plants will surround the demonstration first-aid garden, showing the indigenous plants native to the Albertine Rift that have other

Ensete from Uganda growing in the NC Zoo greenhouse (Gin Wall)

Rebuilding the medicinal plant banda, TBG, Uganda (Carolyn Brown)

medicinal properties. Programs at the garden already focus on working with traditional healers and herbalists in the conservation and preservation of traditional knowledge threatened by modernization.

Benefiting equally

> *"Exhibiting tropical plants* ex situ *brings with it the responsibility to also work for their conservation* in situ. *"*

The partnership with Tooro Botanical Garden allows the Zoo to meet this responsibility and has given us other benefits. The Zoo has learned a great deal about unique ecosystems from our partners. We have acquired plant species that we use in our exhibits for environmental education. The one flagship plant the Zoo has acquired from Uganda so far gives us a great story to engage our visitors and encourage them to care about the environment. Our partnership and the networks it creates, give us first-hand material for graphics and interpretation in the park.

The partnership has also provided unique opportunities for Zoo staff. While working with Tooro garden staff, Zoo horticulturists also expand their own capacity to plan and care for the Zoo's tropical collection. Zoo staff improve their skills in relation to organizing, planning, coordinating and understanding cultural diversity and these enrich our institution.

Working *in situ*, we learn a great deal about the natural habitats we are trying to represent. Seeing and experiencing the habitat directly allows us to acquire images, experiences and other useful insights such as colors, spacing of plants, forest floor esthetics, and animal/plant relationships that are not usually available from books or from the internet. Photos and drawings are critical to our design process. We spend hours trying to find habitat shots of places that we haven't been too, which we then use to create accurate exhibits. Finding published photos of details like the forest floor or how a stream edge looks or how plants grow in relationship to each other is difficult. These less than exciting images do not normally get published but are invaluable to our work. On each partnership visit we send different staff into these field situations to develop their design capacity and to build our collection of habitat images.

Learning how to fund a program such as this

The traditional emphasis and ability to raise funds for an international conservation program at the NC Zoo is, understandably, focused on animal species. Creative fund raising and developing partnerships has been the key to building a funding strategy for the Tooro Botanical Gardens project.

It has taken a while, but we have come to understand and accept that horticulturists need skills in marketing, fundraising and grant writing too. It also helps to be an entrepreneur and stay on the lookout for funding opportunities. We are still learning these skills for ourselves and are discovering how to motivate people in other areas of the Zoo that already have these skills to join us. Zoo horticulture requires us to wear many different hats and our new conservation fund raising and promotions hat is one more to add.

In an effort at blending both plant and animal conservation, the NC Zoo held the first Plant Conservation Day Sky Art event in 2009. Leveraging partnerships with the Association of Zoological Horticulture the 2010 Sky Art event was held at five institutions and used to raise funds for the new AZH Keystone program. The Tooro Botanical Gardens is the first recipient of the AZH Keystone Project award.

The 2010 NC Zoo Sky Art image story comes from a photo with George Bwambale, supervisor at the Tooro Botanical Gardens and Stephen Moore, a horticulture curator at the North Carolina Zoo examining an *Aframomum* species at the Tooro Botanical Gardens. Wild gorillas, chimpanzees and other primates in Uganda rely on *Aframomum* (Alligator pepper) as an important food and medicinal plant. We are using this story to convey to Zoo audiences that their support can help preserve some of the world's plants and the wildlife that depends upon them for survival. We are asking them to "Help plant a seed for conservation".

Recruiting other funding partners is also important. Smith College and the Jacksonville Zoo and Botanical Garden have both channeled funds through North Carolina Zoo to plant conservation activities at Tooro Botanical Garden. This unusual donation from non-profit to non-profit is good use of their resources and takes advantage of the groundwork that the NC Zoo has laid in Uganda. Our experience has taught us that having realistic expectations, making the effort to coordinate, brokering small donations from many institutions into one program, setting measurable goals, being transparent and clear about the use of other institution's funds and using expertise and in-kind contributions from partners can lead to success.

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TBG supervisor George Bwambale with rare African cycad Encepalartos whitelockii *(Stephen Moore)*

Authors: Daniel Bishop and Brooke Stark

AUSTRALIA AND NEW ZEALAND:
INTERNATIONAL PARTNERSHIPS IN HORTICULTURE

Many BGANZ gardens have well-recognised international linkages, bringing distinct benefits to all involved.

Participants at the Botanic Gardens Management Course in Singapore

Introduction

Despite concerted effort and much goodwill, the botanic garden community has failed to realise by 2010 the ambitious objectives of the first Global Strategy for Plant Conservation (GSPC). The recent BGCI review *Saving Plants, Saving the Planet* (Sharrock, *et al*., 2010) reports on examples from around the globe, acknowledging the difficulty for some countries to provide information due to language, format issues or lack of data. However even relatively advanced botanic garden communities such as Australia have not met the most pertinent target for them: 60% of threatened species in *ex situ* collections (nationwide the figure hovers at around 21%). So what responsibilities do members of Botanic Gardens Australia and New Zealand (BGANZ) have to assist in the development of emerging botanic gardens in the world? With funding for our own projects increasingly difficult to come by, and plenty of work still needed at home, it's a stretch to suggest we need new international partnerships to obtain display material for our collections… After all, aren't we all devolving back to regional flora bases anyway?

Meeting plant conservation targets

Saving Plants, Saving the Planet does highlight some positive outcomes but is perhaps more insightful for what it is unable to report, especially from those regions whose flora is not well accounted for. As the Convention on Biological Diversity's *Plant Conservation Report* (SCBD, 2009) notes "There are still serious gaps in capacity for *ex situ* conservation, especially in Africa, parts of Asia, the Caribbean, Latin America and the Middle East, where existing institutions involved in *ex situ* conservation are often poorly resourced." Without doubt we must look anew at what we are proposing for *ex situ* conservation and redouble efforts to effect serious change within our regions.

Many BGANZ gardens and particularly our 'capital city' botanic gardens have well recognised international linkages. Most often these revolve around research collaboration, sister city arrangements, plant exchanges or personal associations at executive level. How are we moving beyond this paradigm of interactions between established institutions to the groundbreaking work required to enable Target 8 to be realised? As the *Plant Conservation Report* notes:

> *"More integration of the activities undertaken by botanic gardens and gene banks is needed to ensure that shared priorities can be developed, and experiences, resources and technologies shared."*

Is it too obvious to suggest that only though networking and the targeted development of 'non prestigious' or perhaps not yet established gardens can we dramatically improve our chances of reaching these *ex situ* targets?

While BGCI continues to provide the lead for the coordination of development programs, the establishment of BGANZ in 2005 has helped provide a platform from which regional botanic gardens in Australia and New Zealand can assist the implementation of GSPC targets. The 2007 *BGANZ International Networking Policy* outlines the value of international networking for our organisations and assists in determining the best response to an approach to their agency. Providing guiding principles and outlining strategies; it encourages collaborative effort to share information, provide skills, develop resources and assist policy development, particularly with our regional neighbours in East Asia, Southeast Asia and the Pacific region. BGANZ recognises that an effective pathway to reach Target 8 is to build capacity in living collections management. While science programs have for many years recognised the need to form collaborative efforts as an essential ingredient to their work, curatorial staff on both sides of the development divide, rarely see or seek the benefits of building such productive partnerships. By improving skills and providing guidance to staff working in botanic gardens or allied industries to implement modern techniques of botanic horticulture, record keeping and seed conservation, we can directly assist their ability to propagate, document and conserve their regional flora.

International training courses

In March 2010 a certificate course was launched by BGCI in Singapore to provide training in botanic garden management. Successfully hosted by Singapore Botanic Garden (SBG) with contributions from three BGANZ gardens in Australia and the Royal Botanic Garden, Edinburgh, this was the first attempt to specifically focus our attention on developing technical skills in botanic garden staff within the region. Topics ranging from sustainable waste management, record keeping systems, safe arboricultural practices and *ex situ* conservation, through seed-banking and public garden education were covered over a 2-week period. Fourteen students from eight countries participated in what is hoped will become a regular calendar event. An intensive program such as this can only remain viable through the contributions of staff from a number of participating organisations, sharing the financial burden and through the encouragement of sponsorship partners. In this case the BGANZ gardens funded their staff participation and provided some financial support for the course. This funding was sourced specifically for development programs and apart from staff time, did not detract from their core functions at home or impact on limited BGANZ resources.

The future success of this program will rely on the ability of course developers to focus on the needs of participants, while harnessing the skills present within BGANZ/SBG horticultural and research staff, with the aim of reducing the capacity deficiencies identified within the GSPC. While a number of scholarships and part scholarships where offered to encourage broad participation in this training course, it inevitably targets those sufficiently confident and resourced to attend. BGANZ is aware there is an altogether different audience that requires assistance, those less active in the botanic garden community.

Training Tanzanian staff in plant identification and seed collecting (Luke Sweedman)

The Royal Botanic Garden Edinburgh (RBGE) introductory training course in basic horticulture and field botany skills provides a proactive format to facilitate international collaboration. BGANZ is keenly interested in partnering in the development and implementation of such grass roots programs and sees the RBGE courses as a model for disseminating basic horticultural education into regions that may not yet identify their parks and gardens as conservation agencies. By working collaboratively with BGCI, RBGE and others, BGANZ can share the overall financial costs of widespread implementation as well as reducing the administrative burden often encountered by duplication.

Collecting seed of Horwoodia dichsoniae *in Saudi Arabia (Luke Sweedman)*

Training nursery staff in Saudi Arabia on seed cleaning techniques (Luke Sweedman)

Other partnerships

Of course individual BGANZ gardens are also making significant and widespread contributions. Many gardens retain a focus on their historic links, just one example being the interactions between Adelaide Botanic Garden and Georgetown, Guyana, which have existed since the 1860's. New Zealand gardens continue to provide support to Pacific nations, often as a consequence of long established community relationships. The Wellington Botanic Garden is currently exploring opportunities to provide operational training programmes within New Zealand for staff of Honiara Botanic Garden in the Solomon Islands. These historic and community partnerships can still deliver very tangible benefits at both ends of the relationship as can new programs formed with old colleagues. Support from Kew's Millennium Seed Bank project has enabled Australian botanic gardens to establish their own network of seed banks. Generally modest in size in comparison with our northern hemisphere colleagues, the skill of operational staff and their experience working with limited resources are often ideally illustrative for developing countries. The small Royal Tasmanian Botanical Garden seed bank has assisted Asia's largest, Kunming, providing staff on short term exchange.

> *"Partnerships may be based on historic links, community relationships or specialised skill sets."*

Other gardens are forging completely new links to help plan new botanic gardens or providing specialist assistance to improve the capability of their conservation programs. Western Australia's Kings Park and Botanic Garden is active in the Middle East assisting various countries with similar climatic conditions to understand the complexity of dry land ecosystem restoration as well as fundamental activities of seed collection, propagation and botanic garden management. The Royal Botanic Gardens, Melbourne is working with Chagual Botanic Garden in Santiago, assisting to design and establish a 'modern' botanic garden for Chile. In February 2011 the Botanic Gardens Trust, Sydney (BGT) will form a new relationship, assisting in the development of a proposed Forest Botanic Garden near Bidoup-Nuiba National Park in central Vietnam.

We should not forget the distinct benefits our own organisations gain through partnering in these relationships. Participating staff develop new skills, networks and experiences outside regular activities, bringing renewed confidence and ideas to their positions as well as encouraging them to carefully research their own procedures as they pass them to others. Agencies working outside their 'walls' in support of global climate change and conservation agendas can as a consequence find additional support for their broader activities from government, the community and sponsors.

> *"While larger projects do require support either from sponsorship or agency funds, all gardens can make small meaningful contributions."*

Simply maintaining contact with visitors or inquiries from developing regions, BGANZ gardens can provide an opportunity for ongoing support and communication that may later flourish into tangible programs. We should all consider providing several sponsored places during botanic garden conferences to encourage attendance from regional neighbours or students. Local community/Friends groups may be able to provide a translation service or provide short term hospitality and accommodation. Another effective strategy is to encourage Friends organisations to support programs that seek to achieve GSPC aims. Several gardens including Auckland Botanic Gardens and BGT Sydney have developed closer relationships with botanic gardens in China, Malaysia, Indonesia and elsewhere through Friends-funded scholarships that support staff travel. Offering and facilitating training opportunities within

Participants at the Botanic Gardens Management Course in Singapore

your garden to targeted groups can provide invaluable work experience. One attempt being undertaken by the Mount Annan Botanic Garden in south western Sydney is through the establishment of a work experience partnership with a tertiary education provider who attract international students to their horticulture training programs. These are examples of simple measures all BGANZ gardens can use to share their wealth of experience without the need for significant funding. Heads of botanic gardens need to ensure there is an understanding within their organisation of these activities and facilitate discussions with government, existing sponsors and Friends groups regarding their importance.

Conclusions

Both BGCI and BGANZ have a fundamental role to play in bringing potential partners together, tapping into the latent enthusiasm for botanic garden staff to be more involved in shared programs that meet GSPC objectives. As lead agencies they may better initiate collaborative agreements with aid agencies, federal governments and partnering organisations that remain sustainable over time. Significant suspicion remains for many garden managers on both sides for 'unsolicited' enquiries or 'random' offers. The role of BGCI in linking requests for assistance with possible support needs should be enhanced so that outreach programs can find their intended targets less by accident and more by design.
As well as the inevitable cultural misunderstandings, language is another barrier that can be alleviated through this facilitation process to ensure projects are not hampered by conflicted agenda's and that consistent outcomes are generated.

BGANZ is seeking to increase involvement within our region to tackle a renewed focus on *ex situ* conservation. We need to accelerate our activity to meet the updated Target 8 for 2020 of "at least *75 percent* of threatened plants in *ex situ* collections, preferably in the country of origin and 20 percent of them included in recovery and restoration programmes", making sure it is not just freshly minted ambition…

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SINO-AMERICAN BOTANICAL EXCHANGE:
CHARACTERISTICS OF SUCCESS AND LESSONS LEARNT

Studies show that the most successful collaborations involve meaningful institutional commitments that last over time.

The Chinese National Herbarium

Introduction

International collaboration is increasingly recognized by botanic gardens, arboreta, and other public horticulture institutions as fundamentally important to fulfil the research, education, display, and conservation components of their respective missions (Hird, 2007; Raven, 2007; Rudyj, 1988). Many of the most pressing challenges today are truly international in scope. Concerns such as environmental degradation and ecological changes, the invasiveness of introduced plants, insects, and other pathogens, conservation and afforestation efforts, and the interconnected global economy require greater international exchange and collaborative research at all levels. Nonetheless, engaging in a meaningful international partnership is easier said than done. How does a public garden determine the best way to engage with potential partners in another country? What characteristics even constitute a successful exchange? How does one overcome the daunting and seemingly endless challenges?

Based on the research of a recent graduate of the Longwood Graduate Program at the University of Delaware, USA, this article details the collaborative motivations between public gardens in China and North America, the challenges they encountered, and the characteristics of successful cooperative relationships (Seyler, 2009). A two-pronged research approach was utilized, collecting data from both the Chinese and North American perspectives. Semi-structured, on-site interviews were conducted with the directors and/or upper management at 11 Chinese botanic gardens in seven provinces and provincial-level cities. Selected gardens reflected the variety of sizes and institutional models in China as well as the country's geographic diversity (See Table 1). Surveys, interviews, focus groups, and case studies documented

Xishuangbanna Tropical Botanic Garden

Lion Forest

Shanghai Botanical Garden

the North American perspective with data collected and examined from the American Public Gardens Association, The Garden Club of America, the North American China Plant Exploration Consortium, and key public gardens with histories of collaborating with China.

Although this research focused on the collaborative relationships forged between Chinese and North American public gardens, the lessons learned and insights gleaned are also valuable for international collaborative relationships in the larger context. Existing exchanges that proved successful over time were investigated and common factors documented. From plant collecting trips and joint research projects, to collaborative training programs and information exchange, the existence of strong personal relationships was the most important characteristic for overcoming barriers and successfully navigating the regulatory milieu.

"Strong personal relationships are critical to successful collaboration."

Collaborative motivation

Due to China's unique geography, vast native flora, and diversity of extant plant associations rarely seen elsewhere in the world, the chief interests in collaboration from the American perspective were plant collection and germplasm exchange for research, education, and conservation purposes. One of the most persistent motivations of American scientists to study and conserve Chinese flora was its similarity to the native flora of North America and the important implications that this relationship has on understanding the taxonomic and systematic development of the floras on both continents (Boufford & Spongberg, 1983; Cheng, 1983; Del Tredici, 2007; Graham, 1972; Li, 1952; Raven, 1972; Wood, 1972; Wu, 1990; Ying, 1983). Many of the Chinese plants cultivated in American gardens today descend from only a few specimens wild-collected a century or more ago. Over time, due to in-breeding depression, these plants no longer display the same level of adaptability and robust growth and are now less valuable for conservation and research, compared to their wild counterparts.

Although plant collection and germplasm exchange were routinely listed as top collaborative motivators from the American perspective, significant support was identified from every sampled population for additional types of Sino-American collaboration including information and technical exchange, research and conservation work, cultural exchange, internships and educational exchange, as well as staff exchange. Key motivators for many American public gardens were the professional development opportunities for staff to grow in their confidence and in their cross-cultural understanding and to learn the artistry and methods employed by Chinese horticulturists growing traditional horticultural art forms. Research participants emphasized that staff exchange is critically important since it often lays the groundwork for other types of exchange by building meaningful relationships, impacts other modes of exchange, and amplifies their impact.

From the Chinese perspective, botanical exchange has been mostly one-sided in the past. Individuals were sent to study at US universities and public gardens, but the Chinese research participants believed that there was minimal

Manglietia megaphylla

Table 1: Chinese public horticulture institution interview locations

Institution Name -English	Institution Name -Chinese	Affiliations	Jurisdiction	Area	Staff	Students	Taxa	Annual Visitation	Website
Beijing Botanical Garden, North	北京植物园	N/A	Municipal	400 ha	530	N/A	10,000	4,000,000	http://www.beijingbg.com/
Beijing Botanical Garden, South	中国科学院植物研究所植物园	Institute of Botany, Chinese Academy of Sciences	National	119 ha	60	40	6,000	---	http://garden.ibcas.ac.cn/
Guilin Botanical Garden	桂林植物园	Guangxi Institue of Botany, Chinese Academy of Sciences	Provincial	73 ha	190	---	2,100	---	http://www.gxib.cn/
Kunming Botanical Garden	昆明植物园	Kunming Institute of Botany, Chinese Academy of Sciences	Regional	44 ha	48	41*	4,000	300,000	http://www.kib.ac.cn/
Nanjing Botanical Garden, Memorial Sun Yat-Sen	南京中山植物园	Institute of Botany, Jiangsu Province/Chinese Academy of Sciences	Regional/ National	186 ha	250	40	3,000	300,000	http://www.cnbg.net/
Shanghai Botanical Garden	上海植物园	N/A	Municipal	82 ha	155	N/A	5,000	500,000	http://www.shbg.org/
Shenzhen Fairy Lake Botanical Garden	深圳仙湖植物园	Chinese Academy of Sciences	Municipal	587 ha	300	9	7,000	2,000,000	http://www.szbg.org/
South China Botanical Garden	华南植物园	Chinese Academy of Sciences	Regional	1,474 ha	326	277	>11,000	500,000	http://www.scib.ac.cn/
Suzhou Gardens and Landscaping Administration Bureau	苏州市园林和绿化管理局	N/A	Municipal	32 Gardens & Parks	---	---	---	8,000,000	http://www.szgarden.com.cn/
Wuhan Botanical Garden	武汉植物园	Wuhan Institute of Botany, Chinese Academy of Sciences	Regional	70 ha	232	127	8,000	300,000	http://www.whiob.ac.cn/
Xishuangbanna Tropical Botanical Garden	西双版纳热带植物园	Chinese Academy of Sciences	Regional	1,125 ha	223	181	11,700	650,000	http://www.xtbg.ac.cn/

*Students of the Kunming Institute of Botany; additional information obtained from the BGCI GardenSearch database: www.bgci.org/garden_search.php

meaningful reciprocity of Americans coming to study and conduct research in China. However, the Chinese now seek to encourage greater two-way exchange, specifically in terms of information, plant and staff exchange. A free exchange of current information was deemed vital since one never truly knows what information is needed until it is needed. Chinese research participants explained that a major collaborative motivator was to obtain the most up-to-date information on an ongoing basis about best practices, professional trends, continuing and published research and *indices semina*, as well as information and controls for highly invasive, introduced plants. Periodicals and newsletters like BGjournal were mentioned as quite helpful in communicating conservation issues, funding opportunities, and other so-called "hot-topics" (Wang, 2008).

As with the Americans, many Chinese research participants cited plant exchange for joint research and conservation purposes as being a critical collaborative goal. Many viewed a greater emphasis now on conserving and promoting a garden's local plants. Nevertheless, collecting, conserving, and displaying so-called "superstar" plants (Chen, 2008), such as flashy cultivars, extremely rare plants, and others which may be used to easily connect with and educate the public, were deemed crucial. There was also interest in greater exchange of cultivars and hybrids for display and education purposes.

The Chinese research participants resoundingly identified staff exchange as the most important collaborative goal for their respective institutions since it expedites the establishment of the necessary relationships, mutual understanding, and critical contact networks that enable all other types of exchange to occur. They also believed it facilitates greater communication and enables both partners to learn from each other's strengths. Research participants identified six main professional development goals for staff exchange: best horticultural practices; public education methods; research and conservation techniques; collections management procedures; garden management and public outreach methods; and private fundraising /development strategies.

Collaborative challenges

Because of the rapid changes in China, many of the American research participants noted the importance of staying continually engaged in collaboration in order to stay aware of the changes since one's knowledge and experiences can quickly become outdated and of limited value. Many from the Chinese botanic gardens mentioned an interest in developing closer ties with their American counterparts, but they have thus far been unable to do so for various reasons. Data indicate that small public gardens in both the US and China do desire to collaborate and engage in international exchange. However, due to factors associated with and exacerbated by their size, small gardens in both countries are usually unable.

Research participants from every sampled population indicated that domestic and international regulations and bureaucratic red tape, including obtaining proper visas and permits present significant and increasing challenges to collaboration. Confusion related to the implications of international treaties and the lack of uniformity in local enforcement were also listed as significant challenges. Research participants noted that these challenges reiterated the need for greater cooperation and relationship building between botanical gardens since gardens, researchers and plant collectors can no longer operate in relative isolation.

Language and cultural concerns were also identified as collaborative difficulties. Since expectations and assumptions vary from culture to culture, considering how cultural expectations are to be addressed (e.g.

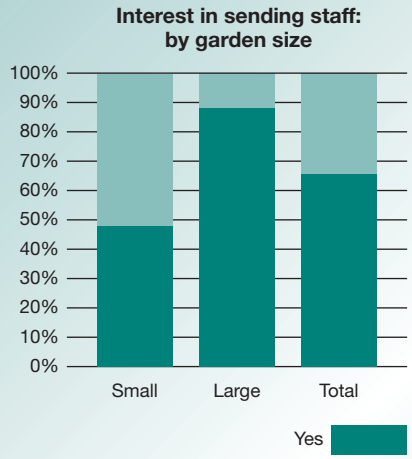

Figure 1: Interest of respondent institutions for sending members of their own staff to study at Chinese botanical gardens, sorted by institutional budget size (large = annual budget of at least $1 Million).

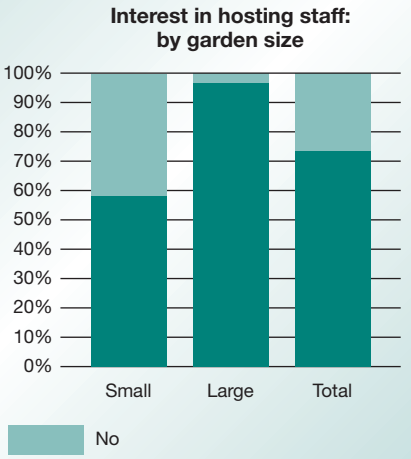

Figure 2: Interest of respondent institutions for hosting staff persons from Chinese botanical gardens for study, sorted by institutional budget size (large = annual budget of at least $1 Million).

who pays for what and when) is quite important and should be clarified from the start to ensure balance and equity. In addition, differences in public opinion and understanding from one country to the other can lead to major challenges. For example, collaborations dependent on "common assumptions" in one country may require significant educational efforts and/or greater advocacy in the other country if the assumption is not yet widely shared there (Aniśko, 2008).

"Domestic and international policies and regulations, language and cultural differences all present challenges when establishing a partnership."

Lack of time, funding, and proper contacts, as well as insufficient knowledge regarding the institutional strengths of potential collaborative partners were identified as inhibitory to collaboration on both sides. There are more than 150 botanical gardens in China and more than 500 in North America. With each being structured differently according to different institutional models, it is quite difficult for gardens in one country to assess the institutional strengths of specific gardens in the other country. Not having a way to obtain this knowledge within the other country makes determining the most advantageous collaborative partner for a particular need quite difficult.

Addressing the challenges

Research participants noted that the most successful collaborations are ongoing and involve meaningful institutional commitments that last over time. The rapid pace of change today reiterates the importance of ongoing collaboration in order for institutions to remain abreast of the changes and maintain up-to-date working knowledge. Chinese public horticulture institutions are rapidly growing, not only in terms of the expansion of existing facilities and capacities but also in terms of the establishment of new institutions. Building and maintaining relationships are critical to successful collaboration and collaborative partners should be willing to invest time, patience, and perseverance into developing good relationships. A successful collaborative relationship goes beyond individual projects, transcending their founding impetus, outliving the individuals that start them, and significantly benefitting the participating institutions on a number of fronts. Ongoing collaboration allows both sides to better understand the strengths, weaknesses, and priorities of their partner in order to better work together to meet shared goals.

All research participants defined successful collaboration to be both mutually beneficial and reciprocal. Not only should substantive benefits be derived on both sides, but exchange and movement of personnel, information, techniques, and resources should freely flow in both directions. All parties should gain from the experience, derive benefits, and be pleased with the results. Both sides should be upfront and clear about their goals and desired outcomes, should have a genuine interest in helping each other, and should possess an attitude of openness and engagement to facilitate communication and create an atmosphere of mutual trust.

Collaborators in a successful exchange should be considered equal partners with complementary resources, know-how, technology, plants, and information. Each side should be able to learn, accomplish, or improve something that they otherwise could not do on their own. Benefits need not be financial but should be of sufficient incentive to justify the collaboration. There should be a shared direction or common basis for collaboration, and the limits of each participant's role and obligations should be clearly understood. Each party should seek to understand the other's strengths and weaknesses and learn as much about their collaborator's culture as possible.

"Successful collaboration should be both mutually beneficial and reciprocal."

Staff exchange is well positioned to address the collaborative challenges existing in both China and North America since it facilitates and promotes ongoing relationship building. Data indicate that building relationships is crucial to successful collaboration since relationships are the basis for and often open the door to other types of exchange. In addition, training done independently or sporadically as opposed to via an ongoing system of exchange minimizes the overall effect that could otherwise be achieved

since many benefits mature and additional opportunities arise over time. According to a survey sent to the American Public Gardens Association's institutional membership, there was significant support expressed for staff exchange with two-thirds expressing interest in sending their own staff to study at Chinese institutions (Figure 1) and three-quarters expressing interest in hosting staff from Chinese botanical gardens (Figure 2). Staff exchange was also mentioned as the top collaborative goal of the majority of Chinese research participants.

Conclusion

In summary, international botanical collaboration is increasingly recognized as necessary to address many of the most pressing challenges facing the world today. Ongoing exchange is essential in order to attain maximum effectiveness over time. Personal relationships are the hallmark of successful collaborative relationships; building and maintaining relationships are crucial to overcoming barriers and collaborative challenges. The more opportunities there are to encourage the formation of relationships, the greater their impact. Staff exchange is one of the most effective means of nurturing cross-cultural professional relationships while also expanding opportunities for other types of botanical exchanges. Therefore, in determining the best way to collaborate with international peers, ensure a successful exchange, and overcome collaborative challenges, the keys that will unlock the doors are found in personal relationships.

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ATELIER « JBF » SUR LES ÉCHANGES ENTRE LES JARDINS BOTANIQUES DU NORD ET CEUX DU SUD

L'association « Jardins botaniques de France et des pays francophones » a organisé en novembre dernier, au jardin botanique national de Meise (Belgique), un atelier sur les échanges Nord-Sud entre jardins botaniques.

Les objectifs:

1 **Echanges d'expériences et communication au sein du réseau.** De nombreuses expériences de coopération Nord-Sud existent dans plusieurs jardins botaniques mais ne sont pas toujours connues. L'atelier avec pour premier objectif de faire connaître ces expériences et d'échanger sur les difficultés rencontrées.

2 **Comment développer de nouveaux projets dans le cadre du réseau francophone?** A partir de ces expériences et à l'aide d'outils adaptés, nous nous sommes interrogés sur les possibilités de développer de nouveaux projets avec des pays du Sud et par la même occasion d'étendre le réseau francophone de notre association.

Les exemples

Sept institutions (de Belgique, de France, de la République Démocratique du Congo et de Suisse) ont présenté leurs projets Nord-Sud. Ceux-ci sont très variés et vont de l'édition de flores régionales d'Afrique et d'Amérique du Sud, à la restauration de jardins botaniques (Tsimbazaza à Madagascar, Cochabamba en Bolivie, Kinshasa, Kisantu et Elea en RDC) ou d'herbiers nationaux (Phnom Penh au Cambodge et Ventiane au Laos), à des travaux de recherche (recherche sur l'écologie et la conservation des métallophytes du Katanga) ou d'inventaires botaniques avec des botanistes du Sud et du Nord (descente du fleuve Congo), à l'animation de réseaux de jardins botaniques africains (CABGAN), à la restauration de zones dégradées avec des essences forestières indigènes (Madagascar) et enfin aux activités éducatives (Sénégal, Paraguay).

Les outils pour développer des projets

Une partie de l'atelier a été consacré aux différents outils pouvant appuyer les projets de coopération et d'échanges entre jardins botaniques du Nord et jardins botaniques du Sud.

La coopération décentralisée est un dispositif français original qui permet à une collectivité locale (région, département, communes) de travailler avec une région du Sud dans différents domaines (santé, éducation, développement). De plus en plus, la coopération décentralisée prend en compte les problèmes environnementaux et la conservation de la biodiversité. Pour les jardins botaniques publics, la coopération décentralisée peut être utilisée pour proposer des échanges avec des partenaires du Sud. Les villes jumelées peuvent aussi être une opportunité pour développer des actions entre jardins botaniques.

Le dispositif « Sud Expert Plantes », mis en place par le Ministère français des Affaires étrangères, a fait l'objet de discussions approfondies car cet outil a été établi pour renforcer durablement l'expertise scientifique en biodiversité végétale en Afrique, Asie et dans l'Océan indien et favoriser les échanges entre scientifiques et politiques pour participer aux grandes initiatives internationales. Il est cofinancé par les Ministères de la Recherche et des Affaires étrangères et couvre 22 pays dans quatre régions. Il mène des actions dans trois axes :

- formation (master de botanique tropicale) et séminaires (congrès de botaniques, CBD , CITES…);
- appui aux institutions (herbiers & jardins botaniques) et aux réseaux;
- projets de recherche : 31 projets de recherche sélectionnés et financés.

La première phase (2007/2011) va bientôt se terminer. L'atelier a été l'occasion d'échanger avec le responsable du dispositif « SEP » pour étudier l'implication du réseau des jardins botaniques francophones dans la deuxième phase.

Les interventions de Botanic Gardens Conservation International (BGCI) visent à appuyer des actions à envergure locale, régionale et internationale. Bien que cette approche à plusieurs niveaux représente un défi considérable, elle permet à BGCI de répondre d'une manière ciblée à des sollicitations et des besoins de

Partenariats en cours dans les jardins botaniques participant à l'atelier		
Jardins botaniques	**Pays du Sud concerné(s)**	**Domaine de partenariat**
Meise (Belgique)	Afrique centrale (Cameroun, Congo, Gabon, Guinée Equatoriale, Sao Tome et Principe, RDC)	Rédaction de flore, inventaire, restauration de jardins et herbiers, éducation
Nantes (France)	Cameroun, Bolivie	Restauration et création de jardins botaniques, collections décentralisées
Soual (France)	Cambodge, Laos, Madagascar	Plantes médicinales, restaurations d'herbiers, pharmacologie et conservation
Brest (France)	Madagascar, Vietnam	Pépinières forestières, restauration de zones dégradées, écotourisme, éducation, conservation
Genève (Suisse)	Brésil, Paraguay, Sénégal	Ethnobotanique, éducation, plantes médicinales et vétérinaires, publications
La Gacilly (France)	Chili, Madagascar, Sénégal	Plantes médicinales, ethnobotanique, recherche, conservation flore insulaire
JB Massart (Belgique)	Congo	Étude et conservation plantes métallophytes

conservation de la diversité végétale, tel que des projets de conservation d'espèces en danger critique d'extinction (p. ex. en Chine et au Cambodge), la coordination de réseaux de jardins botaniques à l'échelle régionale (p. ex. le réseau des jardins botaniques des pays de l'Asie du sud-est) ou bien par son soutien au développement et la mise en œuvre de politiques relatives, notamment la Stratégie Mondiale pour la Conservation des Plantes de la Convention sur la Diversité Biologique.

Conclusions

L'atelier a fait la preuve que les actions de coopération avec les jardins botaniques du sud existent mais qu'un recensement plus fin est nécessaire ainsi qu'une meilleure lisibilité et communication sur ces projets. L'atelier a fait état d'actions de soutien technique aux structures existantes, d'initiatives de conservation *in* & *ex situ*, d'initiatives centrées sur l'éducation environnementale et de création de réseaux pour faciliter la mise en œuvre de la Stratégie Mondiale pour la Conservation des Plantes.

Formation (training) in Madagascar (CBN Brest)

Parmi les difficultés évoquées, citons : la situation politique de certains pays, la fiabilité des partenaires, l'éloignement, le manque d'actions communes et de moyens, les problèmes de management financier et de personnel (instabilité, manque de formation), la non-visibilité des acteurs locaux au plan national et international, l'absence ou difficulté d'accès à Internet, et, pour les réseaux régionaux, les difficultés de coordination par manque de secrétariat fonctionnel.

Les impératifs évoqués pour la réussite des projets sont: nécessité de contacts avec les acteurs internationaux et de liens avec les autres partenaires régionaux, travail en partenariat avec une ONG locale, préférence des micro projets (les gros budgets nécessitent des personnes en local pour le suivi des fonds).

Parmi les attentes des jardins botaniques du Sud vient en priorité la demande de formations dans les domaines de la conservation, l'éducation environnementale, le management et de la gestion de collections, l'aménagement paysager.

Les suites de l'atelier

Un partenariat entre JBF et BGCI semble opportun pour développer le réseau des jardins botaniques francophones. De même une meilleure synergie entre les programmes permettrait de mutualiser des moyens. Le système de «parrainage» de jardins du Sud par des jardins du Nord va être proposé aux adhérents de l'association JBF.

Parmi les axes de travail envisagés, retenons le recensement, dans le réseau francophone, des organismes et personnes ressources qui pourraient apporter leurs compétences dans les domaines de la connaissance, de la conservation et de l'éducation. L'organisation, en Afrique, d'une formation francophone sur la conservation (similaire à celle du BGCI à Kew) va être explorée. Enfin, une réflexion sera faite sur les outils pédagogiques disponibles pour développer des actions éducatives avec nos partenaires du Sud. JBF va proposer d'organiser une session sur cette thématique lors du prochain congrès mondial de l'éducation qui aura lieu à Mexico en octobre 2012.

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Participants at the workshop in Belgium

NORTH-SOUTH PARTNERSHIPS BETWEEN FRANCOPHONE BOTANIC GARDENS

The association Botanic Gardens of France and Francophone Countries (JBF) organised a workshop on North-South exchanges between botanic gardens in November 2010 at the National Botanic Garden of Belgium in Meise.

Objectives of the workshop :

1 **Exchange of experiences and communication within the network.**
Numerous examples of North-South collaboration exist in botanic gardens, but these are not always well known. The main objective of the workshop was to share experiences of partnership projects and exchange information on the difficulties encountered.

2 **How to develop new projects in the framework of the francophone network.**
Based on experiences to date, and with the help of relevant tools, the workshop discussed the possibility of developing new projects with countries in the South, while at the same time extending the francophone network.

Examples of partnerships

Seven institutions (from Belgium, France, Democratic Republic of Congo [DRC] and Switzerland) presented their North-South projects. These are very variable, ranging from the development of regional floras in Africa and South America, to the restoration of botanic gardens (Tsimbazaza in Madagascar, Cochabamba in Bolivia and Kinshasa,

Current partnerships in botanic gardens participating in the workshop		
Botanic garden	**Southern country**	**Type of partnership**
Meise (Belgium)	Central Africa (Cameroon, Congo, Gabon, Equatorial Guinea, Sao Tome and Principe, DRC)	Preparation of floras, inventories, botanic garden and herbarium restoration, education.
Nantes (France)	Cameroon, Bolivia	Restoration and creation of botanic gardens, decentralised collections.
Soual (France)	Cambodia, Laos, Madagascar	Medicinal plants, restoration of herbaria, pharmacology and conservation.
Brest (France)	Madagascar, Vietnam	Forest nurseries, ecological restoration, ecotourism, education, conservation.
Geneva (Switzerland)	Brazil, Paraguay, Senegal	Ethnobotany, education, medicinal and veterinary plants and publications.
La Gacilly (France)	Chile, Madagascar, Senegal	Medicinal plants, ethnobotany, research, island flora conservation.
JB Massart (Belgium)	Congo	Studies on the conservation of metallophyte plants

Kisantu and Elea in DRC) and national herbaria (Phnom Penh in Cambodia and Ventiane in Laos). Projects also addressed research needs (e.g. on the ecology and conservation of metallophytes in Katanga) and the development of plant inventories involving botanists from the South and the North (e.g. the river Congo expedition). Other activities include the stimulation of botanic garden networks (CABGAN), the restoration of degraded areas using indigenous tree species (Madagascar) and finally education activities (Senegal and Paraguay).

*The "Fleur du cuivre" (*Haumaniastrum katangense*) (Pierre Meerts)*

Tools to support project development

A part of the workshop was dedicated to the different tools that can help support projects involving cooperation and exchange between botanic gardens of the North and the South.

Family gardens in Hann-Dakar, Senegal (CJB)

'Decentralised cooperation' is a French system that allows a local collective (region, department, commune) to work with a region in the South in various areas (health, education, development). Increasingly, 'decentralised cooperation' includes environmental issues and the conservation of biodiversity. For public botanic gardens, 'decentralised cooperation' can be used to propose exchanges with partners in the South. The twinning of towns can also provide opportunities to develop actions between botanic gardens.

The project *Sud Expert Plantes* developed by the French Ministry of Foreign Affairs was the subject of in-depth discussions because it had been established specifically to build capacity and scientific expertise in plant diversity in Africa, Asia and the Indian Ocean in a sustainable manner. It has supported exchanges between scientists and policy makers so that they can participate in large international initiatives. It is co-financed by the Ministry of Research and the Ministry of Foreign Affairs and includes 22 countries in four regions. Activities are divided into three main themes:

- Training (Masters of Tropical Botany) and seminars (botanical congresses, CBD, CITES etc.);
- Support to institutions (herbaria and botanic gardens) and to networks;
- Research projects – 31 projects have been selected and financed.

Scientific expedition in DRC organised by Congolese and Belgian partners (Brigitte Vermaelen)

The first phase (2007-2011) will end soon. The workshop provided an opportunity to discuss with the Project Coordinator the possible involvement of the francophone botanic garden network in the second phase.

The presentation by Botanic Gardens Conservation International (BGCI) highlighted the support it provides for actions taken at local, regional and international level. Although this approach at several levels represents considerable work, it does allow BGCI to respond in a focused manner to plant conservation needs. This includes conservation projects for critically endangered species (e.g. in China and Cambodia), the coordination of regional botanic garden networks (e.g. the Southeast Asia botanic garden network) and providing support for the development and implementation of relevant policies, notably the *Global Strategy for Plant Conservation of the Convention* (GSPC) of the Convention on Biological Diversity.

Conclusions

The workshop showed that cooperative actions between botanic gardens in the North and the South do exist, but greater efforts are needed to define these further and give them greater visibility. The workshop noted the types of technical support being provided by the existing partnerships, initiatives for conservation *in situ* and *ex situ*, initiatives focused on environmental education and the creation of networks to facilitate the implementation of the GSPC

Among the difficulties identified, the following were noted: the political situation in some countries, the weakness of partners, remoteness of sites, the lack of joint actions and resources, problems of financial management and of personnel (lack of training and job security), the lack of visibility of relevant actors at the local and international level, the absence or difficulty of access to the internet and, for regional networks, difficulties of coordination due to the lack of secretariat support.

The criteria identified for the success of projects are: importance of contacts with international actors and links with other regional partners, working in partnership with local NGOs and a preference for micro-projects (large budgets require local personnel to manage the funds).

Amongst the priority needs of the botanic gardens in the South are the needs for training in the areas of conservation, environmental education, management of collections and landscaping.

Next steps

A partnership between JBF and BGCI would provide opportunities to further develop the network of francophone botanic gardens. Similarly, a better synergy between these programmes would allow more efficient use of the funds available. A system of 'sponsorship' for gardens in the South by gardens in the North will be proposed to the members of the association JBF.

Among the work themes envisaged is the carrying out of a survey of the francophone network to identify the organisations and human resources that have the capacity to provide support in conservation and education. The organisation in Africa, of a francophone training course on conservation (similar to those of BGCI and Kew) will be explored. Finally a study will be made of the on the educational tools available to develop education activities with partners in the South. JBF proposes organising a session on this at the next global botanic gardens education congress, which will take place in Mexico in October 2012.

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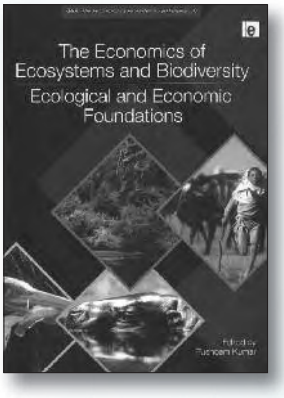
Distributing Aquilaria *seedlings in Cambodia (BGCI)*

RESOURCES



The Economics of Ecosystems and Biodiversity – Ecological and Economic Foundations

Edited by Pushpan Kumar

A global study on the economics of ecosystems and biodiversity (TEEB) was first proposed at a meeting of the G8+5 environment ministers in Germany in 2007. Their inspiration was the Stern review, published in 2006, which had built on the science of the IPCC and presented a powerful economic case for early action on climate change.

The history of post-war economic growth has been one of unsustainable development; unsustainable for the planet's ecosystems, for its species diversity and indeed for the human race. By some recent yardsticks of sustainability, our global ecological footprint has doubled over the last 40 years (Global Footprint Network, 2009) and now stands at 30% higher than the Earth's biological capacity to produce for our needs. The ongoing degradation of ecosystems and loss of biodiversity is well-documented with the Millennium Ecosystem Assessment reporting evidence of significant degradation affecting 60% of our ecosystem services over the past 40 years.

The TEEB initiative, which is hosted by the UN Environment Programme, highlights that the root causes of biodiversity loss lie in the nature of the human relationship with Nature, and in our dominant economic model. It suggests that we have not widely understood that our survival depends on co-existence, on living in harmony with nature. In general, our economic model promotes and rewards *more* versus *better* consumption, *private* versus *public* wealth creation and *human-made* capital versus *natural* capital.

As Sukhdev, the TEEB Study Leader, notes in the preface to the report, we hear more and more frequently of the need to reform society in fundamental ways; to include natural and human capital formation and destruction in accounts of society; to expand the reach of markets in order to enable payments for ecosystem services, to tax what we take (resources) and not what we make (profits from goods and services). The challenge as always is change, and the TEEB's approach in recommending change is to favour pragmatism over perfectionism and solutions that have an immediate start and a foreseeable medium-term outcome over long term initiatives that may not deliver results until it is too late. Observation and recognition of the value of nature's benefits to society is at the heart of the TEEB's recommended solutions. Economic valuations can help to communicate the value of biodiversity to diverse groups of decision makers, using the language of the world's dominant economic and political paradigm.

In order to flesh out a broader holistic economic approach, which recognises the existence and significant economic effects of natural capital, TEEB argues that economic valuation of nature's public goods and service flows is both necessary and ethical, and that shadow prices can and should be calculated and presented in the proper context. This requires us to differentiate biomes, recognise differing socio-economic conditions and evaluate in these contexts a wide range of ecosystem services (such as climate regulation, water provisioning etc.) and biodiversity benefits (such as crop pollination by bees and citizen's enjoyment from visiting national parks etc.). The core of TEEB's content is about assessing and presenting what valid forms economic valuation might take, within what appropriate valuation framework, using which valuation methodologies and always guided by a paramount consideration: the purpose of such valuation.

The report proposes that economic valuation of ecosystem services and biodiversity can contribute to more inclusive economic planning, management and accounting and in the long run, may even contribute to internalising a respect for Nature into western cosmology and social life, thus helping to address a 'root cause' of the problem of biodiversity loss and ecosystem degradation. It calls for more sophisticated cost benefit analysis before policy decisions are made, citing a study in south Thailand on the conversion of mangroves into shrimp farms. Subsidized commercial shrimp farms can generate returns of around $1,220 per hectare by clearing mangrove forests. But this does not take into account the losses to local communities totalling over $12,000 a hectare linked with wood and non-wood forest products, fisheries and coastal protection services.

Examples of countries that have already made the necessary links to a limited extent and are glimpsing benefits in terms of jobs, livelihoods and economic returns that outstrip those wedded to older economic models of the previous century include:

- In Venezuela, investment in the national protected area system is preventing sedimentation that otherwise could reduce farm earnings by around $3.5 million a year.
- Planting and protecting nearly 12,000 hectares of mangroves in Vietnam cost just over $1 million but saved annual expenditures on dyke maintenance of well over $7 million.
- One in 40 jobs in Europe are now linked with the environment and ecosystem services ranging from clean tech 'eco-industries' to organic agriculture, sustainable forestry and eco-tourism.
- Investment in the protection of Guatemala's Maya Biosphere Reserve is generating an annual of income of close to $50 million a year, has generated 7,000 jobs and boosted local family incomes.

The Ecological and Economic Foundations of TEEB was published on 20 October 2010 by Earthscan. Hardback price: £49.99. ISBN 9781849712125

20% discount is available for BGjournal readers when ordering via www.earthscan.co.uk and quoting the promotional code: BGJ012011,

The GSPC targets for 2020

At the 10th Conference of the Parties to the Convention on Biological Diversity in October 2010, revised targets for the Global Strategy for Plant Conservation were adopted. The 2020 targets are:

Objective I:	**Plant diversity is well understood, documented and recognized**
Target 1:	An online flora of all known plants.
Target 2:	An assessment of the conservation status of all known plant species, as far as possible, to guide conservation action.
Target 3:	Information, research and associated outputs, and methods necessary to implement the Strategy developed and shared.
Objective II:	**Plant diversity is urgently and effectively conserved**
Target 4:	At least 15 per cent of each ecological region or vegetation type secured through effective management and/or restoration.
Target 5:	At least 75 per cent of the most important areas for plant diversity of each ecological region protected with effective management in place for conserving plants and their genetic diversity.
Target 6:	At least 75 per cent of production lands in each sector managed sustainably, consistent with the conservation of plant diversity.
Target 7:	At least 75 per cent of known threatened plant species conserved *in situ*.
Target 8:	At least 75 per cent of threatened plant species in *ex situ* collections, preferably in the country of origin, and at least 20 per cent available for recovery and restoration programmes.
Target 9:	70 per cent of the genetic diversity of crops including their wild relatives and other socio-economically valuable plant species conserved, while respecting, preserving and maintaining associated indigenous and local knowledge.
Target 10:	Effective management plans in place to prevent new biological invasions and to manage important areas for plant diversity that are invaded.
Objective III.	**Plant diversity is used in a sustainable and equitable manner**
Target 11:	No species of wild flora endangered by international trade.
Target 12:	All wild harvested plant-based products sourced sustainably.
Target 13:	Indigenous and local knowledge innovations and practices associated with plant resources, maintained or increased, as appropriate, to support customary use, sustainable livelihoods, local food security and health care.
Objective IV:	**Education and awareness about plant diversity, its role in sustainable livelihoods and importance to all life on earth is promoted**
Target 14:	The importance of plant diversity and the need for its conservation incorporated into communication, education and public awareness programmes.
Objective V:	**The capacities and public engagement necessary to implement the Strategy have been developed**
Target 15:	The number of trained people working with appropriate facilities sufficient according to national needs, to achieve the targets of this Strategy.
Target 16:	Institutions, networks and partnerships for plant conservation established or strengthened at national, regional and international levels to achieve the targets of this Strategy.

Please register your contributions to the *International Agenda for Botanic Gardens in Conservation*

International Agenda for Botanic Gardens in Conservation Registration Form

Name of Institution			
Type of Registration	**Formal**	Board Resolution or other form of approval from relevant governing bodies (e.g. university authorities, local, regional or national government	*Please Tick*
	Informal	E.g. by Director/Senior staff.	

BGCI would welcome copies of any formal resolution, motion or other form of endorsement.

Name of responsible person	
Position	
Address	

Email		**Date of Registration**	

Declaration

This institution welcomes the International Agenda for Botanic Gardens in Conservation as a global framework for the development of institutional policies and programmes in plant conservation for botanic gardens.

Without imposing any obligations or restrictions (legal or otherwise) on the policies or activities of this institution/organisation, we commit ourselves to working to achieve the objectives and targets of the ***International Agenda for Botanic Gardens in Conservation.***

Signed		**Date**	

Please sign and detach this registration form and send it to The Secretary General, Botanic Gardens Conservation International, Descanso House, 199 Kew Road, Richmond, Surrey TW9 3BW, U.K.

Thank you for registering with the ***International Agenda for Botanic Gardens in Conservation***.

Please keep a duplicate copy of this form for your records.

How to join Botanic Gardens Conservation International and help us to save plants from extinction

Established in 1987, BGCI links more than 500 botanic gardens and conservation organizations in 115 countries, working together to save PLANTS FOR THE PLANET.

BGCI's INSTITUTION members receive numerous benefits:

- Opportunities for involvement in joint conservation and education projects
- Tools and opportunities to influence global conservation policy and action
- Botanic Garden Management Resource Pack (upon joining)*
- Regular publications:
  - Cuttings – newsletter on botanic gardens and plant conservation (2 per year)
  - BGjournal – an international journal for botanic gardens (2 per year)
  - Roots - Environmental Education Review (2 per year)
  - A wide range of publications and special reports
- Invitations to BGCI congresses and discounts on registration fees
- BGCI technical support and advisory services

	Institution Membership	£ Stlg	US $	€ Euros
A	BGCI Patron Institution	5250	8400	7875
B	Institution member (budget more than US$2,250,000)	788	1260	1050
C	Institution member (budget US$ 1,500,000 - 2,250,000)	525	840	683
D	Institution member (budget US$ 750,000 - 1,500,000)	368	578	473
E	Institution member (budget US$ 100,000 - 750,000)	194	315	263
F	Institution member (budget below US$100,000)*	89	137	121
	**Generally applies to institutions in less developed countries*			

INDIVIDUAL members and donors support BGCI's global network for plant conservation, and are connected to it through our publications and events. Membership categories include:

- Regular publications:
  - Cuttings – newsletter on botanic gardens and plant conservation (2 per year)
  - BGjournal - an international journal for botanic gardens (2 per year)
  - Roots - Environmental Education Review (2 per year)
- Invitations to BGCI congresses and discounts on registration fees

	Individual Membership	£ Stlg	US $	€ Euros
J	Conservation donor (*BGjournal*, *Roots* and *Cuttings* reports and more)	263	420	368
K	Associate member (*Cuttings* and *BGjournal*)	42	68	53
L	Associate member (*Cuttings* and *Roots*)	42	68	53
M	Friend (*Cuttings*) available through online subscription only (www.bgci.org)	11	16	16

Corporate Membership is available; please contact BGCI at info@bgci.org for further details.

**Contents of the Botanic Garden Management Resource Pack include: Darwin Technical Manual for Botanic Gardens, A Handbook for Botanic Gardens on the Reintroduction of Plants to the Wild, 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, additional recent BGCI reports and manuals. BG-Recorder* (a computer software package for plant records) available on request.

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

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CONTACT: Suzanne Sharrock at BGCI: suzanne.sharrock@bgci.org

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BGCI
Plants for the Planet

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Announcing BGCI's 8th International Congress on Education in Botanic Gardens
Education and the Global Strategy for Plant Conservation

Anunciando el 8º Congreso Internacional de Educación en Jardines Botánicos
Educacion y la Estrategia Global de Conservación Vegetal




Jardín Botánico del Instituto de Biología de la Universidad Nacional Autónoma de México, Ciudad de México, Mexico

22-28 October 2012

This congress is for everyone involved in delivering communication, education and public awareness programmes in botanic gardens. During the congress we will focus on how gardens can address all targets of the GSPC through education. We will also agree on a common set of messages for plant conservation.

Convocamos a todas las personas que desarrollan programas de comunicación, educación y concienciación en jardines botánicos. El congreso se enfocará al análisis de como los jardines botánicos pueden abordar todas las metas de la Estrategia Global de Conservación Vegetal (GSPC) a traves de la educación. Acordarermos también un conjunto común de mensajes para la conservacón vegetal.




To register your interest in the congress visit: Los interesados en participar pueden registrarse en la siguiente dirección:

www.bgci.org/education/congress