

roots

BOTANIC GARDENS

Education for Sustainability

- EfS: Some Questions for Reflection
- Nuestra Selva, Nuestra Cultura, Nuestra Vida
- Empowering the Community – Wealth for all – India
- Training Buddhist Monks at Xishuangbanna Tropical Botanical Gardens
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Botanic
Gardens

Conservation

International

Education

Review

December 1998

Education for
Sustainability

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Forthcoming Issues

Roots 18 - Public and Adult Education - Last submission dates: Articles: February 19, 1999, News - March 19, 1999
Roots 19 - Ethnobotany - Last submission dates: Articles - May 21, 1999, News - June 11, 1999

2 Botanic gardens- models for sustainability

■ Editorial

As many of you know Education for Sustainability (EfS) is a subject very close to my heart, so it is with particular pleasure that I welcome you to this issue of Roots. It is my passionate conviction that botanic gardens have the potential to become models for sustainability in their local communities as well as contribute to the wider debate.

Defining EfS is problematic, not least because it is contingent on individual world views – and we are many. It is moreover an evolving philosophy still in its early stages of development. If EfS is not capable of easy definition then one may well ask 'how can botanic gardens become involved in teaching EfS?'. This issue of Roots attempts to look at such issues and offer possible models for EfS.

John Fien and Daniella Tilbury, leading authorities in the field of EFS, set the scene by exploring the historical and theoretical influences on EfS; making a convincing case for EfS to link both the natural and social world. This theme is taken up by Miriam Bonilla, in her article on Omaere, the first ethnobotanical garden in Latin America, in which she describes how the participative environmental education programmes encourage a search for sustainable economic alternatives. Likewise, the Tropical Botanic Gardens and Research Institute in Thiruvananthapuram, India (where BGCI's 4th international education congress will be held in November 1999), focuses on empowering members of the local community to take responsibility for community food, health, nutrition and hygiene.

▲ Editorial

Comme beaucoup d'entre vous savent que l'éducation pour la gestion durable des ressources (EFS) est un sujet qui me tient à cœur, c'est avec un plaisir particulier que je vous présente ce numéro de Roots. Je suis passionnément convaincue que les jardins botaniques ont la potentialité de devenir des modèles pour la gestion durable des ressources dans leur contexte local aussi bien qu'ils contribuent à élargir le débat. Définir l'EFS est un problème non seulement parce que c'est une somme de points de vues particuliers sur le monde - et nous sommes nombreux - mais c'est par dessus tout une philosophie évolutive encore à ses balbutiements. Si EFS n'est pas d'une définition simple, alors comment peut on définir comment les jardins botaniques peuvent s'impliquer dans l'enseignement de EFS? Ce numéro de Roots tente de jeter un regard sur de tels objectifs et offre des modèles possibles pour EFS.

John FIEN et Daniella TILBURY qui font autorité dans le domaine de EFS, éclairent la scène en explorant les influences historiques et théoriques sur EFS ; ils font de EFS un cas d'école pour lier les mondes sociaux et naturels. Ce thème est illustré par Miriam BONILLA dans son article sur Omaere, le premier jardin ethnobotanique en Amérique Latine, dans lequel elle décrit comment une éducation interactive sur l'environnement induit une recherche d'alternatives pour une économie de gestion durable. De plus les Jardins Botaniques Tropicaux et l'Institut de Recherche à Thiruvananthapuram en Inde (où se tiendra le quatrième congrès international pour l'éducation du BGCI en 1999) se mobilisent pour inciter des membres influents des

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Como muchos de ustedes sabrán, el programa Education for Sustainability (EfS) es un tema que me apasiona especialmente. Es por ello que les doy mi más sincera bienvenida a este número de "Roots". Estoy convencida de que los jardines botánicos pueden convertirse en modelos de equilibrio en las comunidades en que se localicen, y lograr así que se discuta más ampliamente sobre el tema.

Definir este proyecto no es nada fácil, sobre todo si tenemos en cuenta que cada persona tiene un punto de vista particular sobre el mundo, y somos muchos en él. Por lo tanto, se trata de una filosofía en desarrollo que está todavía en sus inicios. Si no podemos encontrar una simple definición para el programa, es fácil preguntarse cómo los jardines botánicos intentan difundirlo. En este número de "Roots" dirigiremos nuestra atención a todos estos temas y trataremos de ofrecer posibles aplicaciones para el EfS.

Los expertos en el campo del EfS, John Fien y Daniella Tillbury, sentaron las bases al explorar las influencias históricas y teóricas sobre el mismo, y lograron un importante éxito al relacionar el mundo social y el natural. Miriam Bonilla trata este tema en su artículo sobre Omaere, el primer jardín etnobotánico de Latinoamérica, y describe el modo en que los programas para la educación medioambiental participativa fomentan la búsqueda de alternativas económicas sostenibles. Del mismo modo, el Instituto de Investigaciones y Jardines Botánicos Tropicales de la ciudad de Thiruvananthapuram (India) tiene como objetivo lograr que los miembros más poderosos de la comunidad local asuman sus responsabilidades y ayuden a mejorar

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For EFS to be truly effective it needs to be woven into the very fabric of the institution. If not, there is always the risk that students and visitors will receive contradictory messages.

Conscious of this, Dawn Sanders at Chelsea Physic Garden, UK, offers an insight into how the message of sustainability underpins everything they do from recycling to their use of cleaning materials in the garden. This message is reaffirmed in an article by Charlie Stirton, Director of the exciting new National Botanic Garden of Wales whose ethos emerges from the conclusions of the 1992 Rio de Janeiro Earth Summit and Agenda 21.

We need to look on EFS as a continuously dynamic and inclusive process which allows space for reflection and reinterpretation. BGCI plans to develop a set of guidelines on EFS for botanic gardens in the coming year and we encourage you to contact us with your suggestions. I hope you find this issue of Roots as stimulating to read as I have to work on and we look forward to hearing from you.

Julia Willison
BGCI

▲ Editorial

communautés locales à prendre des responsabilités pour la nourriture communautaire, la santé publique, la nutrition et l'hygiène.

Pour que l'EFS soit réellement efficace, elle doit être intimement mêlée à la trame de l'institution. Sinon, il y a toujours le risque que des étudiants et des visiteurs reçoivent des messages contradictoires. Pour cela, Dawn Sanders au Chelsea Physic Garden (UK), expose comment le message de gestion durable des ressources peut passer par l'explication de ce qu'ils font pour le recyclage des matériaux dans le jardin. Ce message est repris dans un article par Charlie STIRTON, Directeur du très intéressant nouveau Jardin Botanique National de Galles, qui met en valeur les conclusions du Sommet de la Terre de 1992 de Rio de Janeiro et de l'agenda 21.

Nous devons voir EFS comme un processus dynamique et continu qui offre la place pour la réflexion et l'interprétation. La production par le BGCI d'une série de guides sur l'EFS pour les jardins botaniques dans les prochaines années est en cours et nous vous encourageons à nous contacter pour nous faire part de vos suggestions. J'espère que vous trouverez ce numéro de Roots stimulant à lire autant que moi je l'ai trouvé à préparer et nous espérons avoir de vos nouvelles bientôt.

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las condiciones sanitarias, alimenticias y de higiene. Precisamente en esta institución se celebrará el 42 congreso internacional sobre educación de la BGCI, en noviembre de 1999.

Sin embargo, para sacar el máximo partido de este programa es necesario que todos los cabos están bien atados. De otro modo, se corre el riesgo de que tanto estudiantes como visitantes reciban mensajes contradictorios. Consciente de este hecho,

Dawn Sanders, del Parque de la Física de Chelsea, nos muestra cómo el mensaje de equilibrio ("sostenibilidad") apoya todas sus acciones, desde el reciclado hasta el uso de productos de limpieza en el jardín. Además, el mensaje se ve reforzado por el artículo escrito por Charlie Stirton, director del nuevo Jardín Botánico Nacional de Gales, cuyo espíritu se manifiesta en las conclusiones de la Cumbre de la Tierra de Rio de Janeiro 1992 y de la Agenda 21.

Debemos considerar el EFS como un proceso dinámico y global continuo que deja lugar a la reflexión y la reinterpretación. La BGCI tiene planeado desarrollar el próximo año un conjunto de directrices sobre el EFS para su uso en los distintos jardines botánicos. Asimismo, le animamos a que contacte con nosotros y nos haga llegar sus sugerencias. Espero que disfrute tanto leyendo este número de "Roots" como lo hicimos nosotros preparándolo. Un saludo.

Look for the following symbols...

- English
- ▲ Français
- Español

News up date

■ News

New BGCI Education Officer

BGCI is delighted to announce the new appointment of Ms Lucy Sutherland as BGCI Education Officer. Lucy has a strong background in environmental interpretation and education and has had extensive experience in setting up and managing education programmes in botanic gardens and national parks in Australia. A keen French speaker, Lucy is eager to collaborate on the development of education programmes in French speaking countries and elsewhere. We are sure readers will join us in wishing Lucy every success in her new job.

BGCI Congress in South Africa

Over 400 delegates from 55 countries gathered for the Fifth International Botanic Gardens Conservation Congress held in Cape Town, South Africa this September. Forty workshops were offered during two days on a number of different themes: Conservation Practice, Policies and Conventions, Garden Management and Horticulture, Science and Research, Capacity Building, and Education. There was a great deal of debate during the workshops and the conclusions were presented in the plenary session on the final day. Education had its highest profile yet at the BGCI Conservation Congress and all education sessions were well attended. The conclusions from these sessions are included with this issue of Roots.

The Congress was superbly organised by the National Botanical Institute, Kirstenbosch, and took place during spring when large numbers of wild flowers were in full bloom. Many delegates took advantage of this and joined the mid-Congress tours, where they had a chance to be in contact

▲ Nouvelles

Un nouveau responsable de l'éducation au BGCI

Le BGCI est heureux de vous annoncer la nouvelle nomination de Lucy Sutherland comme responsable de l'éducation. Lucy a une importante formation en éco-interprétation et en éducation à l'environnement, elle a aussi mis en place et dirigé des projets dans les jardins botaniques et parcs nationaux australiens. Pratiquant bien le français, Lucy est motivée pour collaborer au développement de programmes éducatifs dans les pays francophones et ailleurs. Nous sommes persuadés que nos lecteurs se joindront à nous pour souhaiter un vif succès à Lucy dans son nouveau travail.

Congrès du BGCI en Afrique du Sud

Plus de 400 congressistes, venus de 55 pays se sont réunis lors du 5ème congrès du BGCI, qui a eu lieu en septembre à Cap Town, en Afrique du Sud. Durant deux jours, quarante ateliers se sont tenus sur les thèmes suivants : Pratiques de Conservation, Politiques et Conventions, Gestion de Jardins et Horticulture, Sciences et Recherche, Potentiel de développement, Éducation. Beaucoup de débats eurent lieu durant ces ateliers et les conclusions furent présentées lors de la session plénière du dernier jour. L'éducation s'est encore montrée sous ses meilleurs hospices au Congrès et toutes les sessions sur l'éducation ont bien été suivies. Les conclusions de ces sessions sont présentées, avec cette édition de Roots.

Le congrès a particulièrement bien été organisé par l'Institut Botanique National de Kirstenbosch, et comme c'était le printemps les floraisons

● Noticias

Nuevo educador en BGCI

BGCI les anuncia el nuevo nombramiento de MS Lucy Sutherland como educadora de BGCI. Lucy posee un gran conocimiento de la interpretación medioambiental y la educación y, ha tenido una experiencia extensiva en el establecimiento y dirección de los programas educativos en los jardines botánicos y en los parques nacionales de Australia. Lucy habla muy bien francés, y está ansiosa por colaborar en el desarrollo de programas educativos en ciudades de habla francesa y en cualquier sitio. Estamos seguros de que los lectores se unirán a nosotros para desearle a Lucy todo el éxito posible en su nuevo trabajo.

Congreso en Sudáfrica

Más de 400 representantes de 55 países se reunieron para el Quinto Congreso Internacional para la Conservación en los Jardines Botánicos, que tuvo lugar en Ciudad del Cabo (Sudáfrica) el pasado mes de septiembre. Se ofrecían cuarenta talleres durante dos días sobre temas diferentes: Prácticas para la Conservación, Políticas y Convenciones, Dirección de Jardines y Horticultura, Ciencia e Investigación, Capacidad de construcción y Educación. Había mucho que debatir durante los talleres, y las conclusiones se presentaron en la sesión plenaria del último día. La educación ocupaba ya el lugar más alto en el Congreso de Conservación de BGCI y todas las sesiones de educación estaban llenas. Las conclusiones de éstas sesiones se incluyen con este número de Roots.

El congreso estaba organizado por el Instituto Botánico Nacional de Sudáfrica, Kirstenbosch, y tuvo lugar

■ News

with South Africa's flora and fauna. A full report on the Congress is published in BGCNews Vol. 3 No. 1.

Environmental Education workshop for African botanic gardens

Immediately following the Fifth International Botanic Gardens Conservation Congress, 22 students from 13 African countries, attended a five-day training course in botanic garden education at Kirstenbosch Botanical Gardens. The course was organised by the National Botanical Institute and BGCI and sponsored by the British Council.

A wide range of topics were covered including, the role of EE in addressing international conservation policies, developing EE programmes, interpretation, school visits, community participation and resource material development and production. Participatory learning was emphasised throughout the week and students were required to work in groups to produce a funding proposal for an education programme. This was evaluated by the students themselves and a panel of 'experts': Lynne Aschman from the British Council, Razeena Wagiet from WWF-South Africa and Jinny Mullins, former director of a South African NGO.

A manual for the course was produced to support students in developing education programmes once they return to their botanic gardens. The course was a great success and it is hoped that future courses in botanic garden education for African botanic gardens will be run again in South Africa. For more information contact: Ally Ashwell, Head of Education (Southern Gardens) NBI, Private Bag X7, Claremont 7735, South Africa. Fax: (021) 761 4687 or Julia Willison, BGCI.

Polish Workshops

The first Polish workshop for botanic garden education was held from July 13-17 1998 at the Kampinoski National Park, Poland. Generously sponsored by the Mitsubishi Corporation (UK) Ltd and organised by BGCI and the

▲ Nouvelles

étaient abondantes. Beaucoup de congressistes en ont profité, et ont participé à des excursions à mi-congrès, ils ont ainsi eu la chance d'être en contact avec la faune et de la flore d'Afrique du Sud. Un compte-rendu de l'ensemble du Congrès est publié dans BGCNews, Vol. 3 N°1.

Atelier d'éducation à l'environnement pour les jardins botaniques africains.

Immédiatement après avoir suivi le 5ème congrès du BGCI, 22 membres de jardins botaniques de 13 pays africains ont suivi un cours de formation de 5 jours, au Jardin Botanique de Kirstenbosch, sur l'éducation dans les jardins botaniques. La formation était organisée par l'Institut Botanique National et le BGCI, et financée par le British Council.

De nombreux sujets ont été abordés, tels que le rôle de l'éducation à l'environnement dans le mode de recours aux politiques internationales de conservation, le développement de programmes d'éducation à l'environnement, l'interprétation, les visites des scolaires, la participation du public, les moyens matériels pour le développement et la production. Durant la semaine, l'accent a été mis sur l'apprentissage interactif et il a été demandé aux personnes de travailler en groupes pour présenter une offre de financement pour un programme éducatif. Cette offre a ensuite été évaluée par les "étudiants" eux-mêmes et par un panel d'experts : Lynne Aschman du British Council, Razeena Wagiet du WWF-Afrique du Sud et Jinny Mullins, ancien directeur d'une ONG d'Afrique du Sud.

Un ouvrage sur la formation a été réalisé, permettant de soutenir les participants dans le développement de programmes éducatif dans leurs propres jardins. La formation a été couronnée de succès et il est à espérer que les futures formations en éducation dans les jardins botaniques à l'usage des jardins africains se dérouleront en Afrique du Sud. Pour plus d'informations, contacter : Ally Ashwell, responsable de

● Noticias

en primavera cuando un gran número de flores silvestres estaba floreciendo. Algunos representantes se aprovecharon de esto y se unieron a la gira en mitad del congreso, donde tuvieron la oportunidad de estar en contacto con la flora y fauna de África del sur. Un informe completo sobre el Congreso está publicado en BGC News vol. 3, nº 1.

Taller de Educación Ambiental para los jardines botánicos Africanos

Inmediatamente después del Quinto Congreso Internacional para la Conservación de los jardines botánicos, 22 estudiantes de 13 ciudades africanas, asistieron a un curso de preparación para jardines botánicos que duró cinco días y se celebró en el Kirstenbosch, El curso estaba organizado por el Instituto Nacional Botánico y la BGCI y patrocinado por el Consulado Británico.

Se trataron muchos temas, incluido el papel de la Educación Ambiental en cuanto a la política de conservación internacional, desarrollando programas de Educación Ambiental, interpretación, visitas de colegios, participación de la comunidad, desarrollo y producción de material didáctico. Durante la semana se profundizó en la enseñanza participativa, y se pidió a los estudiantes que trabajasen en grupos en la elaboración de una propuesta de financiación para un programa de educación. Esto fue evaluado por los propios estudiantes y por un equipo de expertos: Lynne Aschman del consulado británico, Razeena Wagiet del WWF- Sudáfrica y Jinny Mullins, antiguo director de una ONG del sur de África.

Se elaboró un manual para el curso que ayudase a los estudiantes en los programas de desarrollo de la educación una vez que volvieran a sus jardines botánicos. El curso tuvo un gran éxito y se espera que vuelvan a impartirse cursos futuros sobre educación en los jardines botánicos, en el sur de África.

■ News

Warsaw University Botanic Garden, the workshop was attended by thirteen participants from botanic gardens and national parks all over Poland.

Right:
Participants at
Polish workshop
getting in touch
with nature



The workshop was very successful and participants felt that they would be able to use and adapt the range of environmental education activities and programmes presented during the week. The workshop emphasised the effectiveness of institutions working together to achieve similar objectives and offered participants an opportunity to expand their perceptions of environmental education in botanic gardens. It also highlighted the need for there to be sustained support of the work of Polish botanic gardens in the field of environmental education.

Following on from this workshop, BGCI is delighted to announce that it has received a grant from the UK Darwin Initiative for the Survival of Species to run a further training workshop for botanic garden educators in Poland. The next workshop will take place from 12-16 April 1999.

For further information contact:
BGCI or Hannah Werblan-Jakubiec,
Director, Warsaw University Botanic
Garden, Uniwersytetu Warszawskiego,
A:/ Ujazdowakic 4, 00-478,
Warszawa, Poland.

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l'éducation (Southern Gardens) NBI,
Private Bag X7, Claremont 7735,
Afrique du Sud. fax : (021) 761 4687 ou
Julia Willison, BGCI.

Ateliers polonais

Le premier Atelier Polonais pour l'éducation dans les jardins botaniques a eu lieu du 13 au 17 juillet 1998 au Kampinoski National Park en Pologne. Généreusement financé par la Mitsubishi Corporation (UK) Ltd et organisé par le BGCI et le Jardin Botanique de l'Université de Varsovie, l'atelier a été suivi par 13 participants venus de jardins botaniques et de parcs nationaux de toute la Pologne. La manifestation a été un succès et les participants se sont senti capables d'utiliser ou d'adapter l'ensemble des programmes et des activités d'éducation à l'environnement présentés durant la semaine. L'accent a été mis sur l'efficacité du travail en commun, dont peuvent bénéficier les institutions ayant des objectifs similaires. Les participants ont eu l'opportunité d'étendre leur perception de l'éducation à l'environnement dans les jardins botaniques. Il a aussi été souligné le besoin qu'il y a de prolonger le soutien du travail des jardins botaniques polonais dans le domaine de l'éducation à l'environnement.

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Para más información ponerse en contacto con: Ally Ashwell, Head of Education (Southern Gardens), NBI, Private Bag X7, Claremont 7735, Sudáfrica. Fax: (021) 761 4687 o Julia Willison, BGCI.

Talleres Polacos

El primer taller polaco educativo de los jardines botánicos tuvo lugar del 13 al 17 de julio de 1998 en el Kampinoski National Park de Polonia. Patrocinado generosamente por Mitsubishi Corporation (UK) Ltd. y organizado por la BGCI y la Warsaw University Botanic Garden, asistieron 13 participantes de jardines botánicos y parques nacionales de toda Polonia.

El taller fue todo un éxito y los asistentes pensaban que serían capaces de usar y adaptar el tipo de actividades de educación ambiental y programas presentados durante la semana. El taller destacaba la eficacia de las instituciones que trabajan juntas para alcanzar objetivos similares y ofrecer a los asistentes la oportunidad de extender sus conocimientos sobre la educación ambiental en los jardines botánicos. También se destacó la necesidad del lugar de ser un apoyo para el trabajo de los jardines botánicos polacos en el campo de la educación ambiental.

Como consecuencia de este taller, la BGCI está encantada de anunciar que ha obtenido una subvención del Reino Unido, UK Darwin Initiative, para la supervivencia de las especies y para organizar más tarde un taller de formación para educadores de jardines botánicos en Polonia. El próximo taller tendrá lugar del 12 al 16 de abril de 1999.

Para una información más detallada ponerse en contacto con: BGCI o Hannah Werblan-Jakubiec, Director, Warsaw University Botanic Garden, Uniwersytetu Warszawskiego, A:/ Ujazdowakic 4, 00-478, Warszawa, Polonia. Tél. : 48 22 628 75 14. Fax: 48 22 622 66 46. Email:mgych@ilmus.bot.uw.edu.pl

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Tel: (48) 22 628 75 14
 Fax: (48) 22 622 66 46.
 Email: mzych@ilmus.bot.uw.edu.pl

BGCI Education Congress in India

Have you registered your interest in attending the Fourth BGCI International Congress on Education in Botanic Gardens? If not, there is still time to be included on the mailing list for further information. The Congress, hosted by the Tropical Botanical Garden & Research Institute, will be held from 8-12 November 1999 in

Thiruvananthapuram, Kerala, India.

Congress themes will include Education for Sustainability; Beyond the Limits – Rural and Community Outreach; Development Education and Environmental Ethics; Teaching our Traditions – Medicinal Plants and Ethnobotany and, New Trends in Science Education. For further info, contact BGCI (address on back cover).

International Diploma Course in Botanic Garden Education

The next International Diploma Course in Botanic Garden Education will take place from April 19 to May 15 1999 at the Royal Botanic Gardens, Kew and BGCI, UK. The four week course will focus on a range of topics including environmental education, strategy development, teaching methodology, writing and radio skills, interpretation, marketing and fundraising. For further information and to enrol for a place on the course contact: BGCI or Barrie Blewett, Royal Botanic Gardens, Kew, Richmond, Surrey, TW9 3AB, U.K.

Tel: (44) 181 332 5623

Fax: (44) 181 332 5610.

Upcoming Themes for Roots

Thank you to everyone who returned the questionnaire circulated with the last issue of Roots, the purpose of which was to help us choose the themes for the forthcoming issues of Roots. Of the themes suggested, the most popular ones were Ethnobotany, Environmental Ethics and Evaluation and Assessment of Education Programmes. These were followed closely by: Community Outreach, Planting for Education, Environmental

▲ Nouvelles

A la suite de cet atelier, le BGCI est ravi d'annoncer qu'il a reçu une allocation du Darwin Initiative for the Survival of Species (UK) afin de mettre en place un atelier supplémentaire de formation des éducateurs des jardins botaniques de Pologne. Le prochain atelier aura lieu du 12 au 16 avril 1999. Pour toutes informations complémentaires contacter le BGCI ou Hannah Werblan-Jakubiec, directeur du Jardin Botanique de l'Université de Varsovie, Uniwersytetu Warszawskiego, A/Ujazdowakic 4, 00-478, Varsovie, Pologne. Tél. : 48 22 628 75 14
 Fax : 48 22 622 66 46
 Email : mzych@ilmus.bot.uw.edu.pl

Congrès sur l'éducation en Inde

Vous êtes-vous inscrit pour le quatrième Congrès International du BGCI sur l'Éducation dans les Jardins Botaniques ? Si ce n'est pas le cas, il est encore temps de le faire pour recevoir une documentation. Le congrès aura lieu au Jardin Botanique & Institut de Recherche de Thiruvananthapuram, du 8 au 12 novembre 1999 à Keral en Inde. Les thèmes en seront : l'éducation pour la gestion durable de la biodiversité, développement de l'éducation et éthique de l'environnement, au-delà des limites - l'enseignement des traditions - plantes médicinales et ethnobotanique -, les nouvelles tendances des sciences de l'éducation. Pour tout complément d'informations contacter le BGCI (adresse au dos de la couverture).

Formation internationale diplômante

La prochaine formation internationale diplômante en éducation pour les jardins botaniques sera organisée, du 19 avril au 15 mai 1999 au Jardin Botanique Royal de Kew (siège du BGCI). Durant les quatre semaines de cours sont prévus des sujets comme l'éducation à l'environnement, la planification de développement, la méthodologie de l'enseignement, les compétences en vulgarisation, interprétation, démarchage et financements. Pour toutes information complémentaire et inscription

● Noticias

Congreso de Educación de BGCI en la India

¿Se ha inscrito ya en el Cuarto Congreso Internacional de la BGCI sobre educación en los jardines botánicos? Si aún no lo ha hecho, todavía está a tiempo para que le incluyan en la lista y le manden información regularmente. El Congreso, que será presentado por el Jardín Tropical Botánico y el Instituto de Investigación, se celebrará del 8 al 12 de noviembre de 1999 en Thiruvananthapuram, en Kerala, India. Entre los temas del congreso se incluirán la educación para el mantenimiento, Más allá de los límites, Asuntos sociales, rurales y de la comunidad, Desarrollo de la educación y Éticas medioambientales, Enseñando nuestras tradiciones, Plantas medicinales y Etnobotánica y Nuevas tendencias en la educación de la ciencia. Para más información, contactar con la BGCI (la dirección está al final de la revista).

Curso sobre educación botánica para obtener un diploma internacional

El próximo curso está previsto para el año que viene, del 19 de abril al 15 de mayo de 1999 en el Royal Botanic Gardens, Kew y BGCI, Reino Unido. El curso, que dura cuatro semanas se centrará en una serie de temas entre los que se incluyen la educación medioambiental, el desarrollo de estrategias, la metodología de enseñanza, escritura y habilidades de radio, interpretación, marketing y recaudación de fondos.

Para más información y para reservar plaza para el curso, ponerse en contacto con: BGCI o Barrie Blewett, Royal Botanic Gardens, Kew, Richmond, Surrey, TW9 3 AB, U.K.
 Tél.: 0181 332 5623,
 Fax: 0181 332 5610.

Los próximos temas en "Roots"

Nos gustaría agradecer a todos los que respondieron al cuestionario aparecido en el último número de nuestra revista, y con el que intentábamos que nos ayudaran a elegir los temas que aparecerán en

News

Education Training and Job Swaps, General Plant Education, Master Planning for Education and Multimedia in Education. As previously announced, Roots 18 will be on the subject of Adult and Public Education and as a result of this survey Roots 19 will focus on Ethnobotany and Roots 20 will cover Evaluation and Assessment of Education Programmes.

NEWS FROM BOTANIC GARDENS AROUND THE WORLD

ARGENTINA

Botanical Illustration - Art Worth Conserving

A course on botanical illustration was held in Argentina from 3-14 August 1998 at the Arturo E. Ragonese Botanic Garden, Buenos Aires. The course aimed to re-value botanical illustration, which is sadly in danger of disappearing in Argentina. During the two-week course, students, with knowledge in the field of design, drawing, illustration or plastic arts, were instructed to produce one piece of work in paint and one other in watercolour. At the end of the course

Below:
Botanical
illustration
students, Jardin
Botanico Arturo
E. Ragonese
Botanic Garden,
Buenos Aires.



Nouvelles

contacter le BGCI ou Barrie Blewett, Jardin Botanique Royal de Kew, Richmond, Surrey, TW9 3AB, Royaume-Uni. Tél. : 0181 332 5623, fax : 0181 332 5610.

Les nouveaux thèmes de Roots

Merci à tous ceux qui ont retourné le questionnaire inclus dans la précédente édition de ROOTS, les propositions de chacun nous ont aidé à choisir les thèmes de la prochaine édition. Des thèmes suggérés, les plus populaires étaient l'ethnobotanique, l'éducation environnementale, l'évaluation et l'appréciation des programmes éducatifs ; immédiatement suivis par : la « Portée Communautaire » ; les « Plantations pour l'Education », les « Formations à l'éducation environnementale et les échanges entre métiers », « L'Education générale sur les plantes », « Maitriser l'organisation de l'éducation et les multimédia dans l'éducation ». Comme annoncé précédemment le n°18 de ROOTS portera sur le sujet, « Education du Public et des Adultes », et suite à cet exposé, le n°19 sera consacré à l'ethnobotanique, et le n°20 traitera de « l'évaluation et de l'appréciation de l'Education ».

Noticias

futuras ediciones. Los temas más votados fueron los siguientes: "la etnobotánica"; "la ética medioambiental" y "la evaluación y valoración de los programas educativos". A éstos les siguieron muy de cerca: "ayudas a la comunidad", "plantar para educar"; "el aprendizaje de la educación medioambiental y sus campos de trabajo"; "la educación general sobre el mundo vegetal,"; "plan general para educación" y "multimedia en la educación". Como ya hemos anunciado, el número 18 de "Roots" tratará el tema de la educación pública para adultos. Asimismo, el número 19 hablará sobre la etnobotánica y el número 20 sobre la evaluación y valoración de la enseñanza.

NOTICIAS DE JARDINS BOTANICOS DE TODO EL MUNDO

ARGENTINA

Ilustración botánica - un arte que vale la pena conservar

Un curso sobre ilustración botánica se ha realizado en Argentina del 3 al 14 de agosto de 1998 en el jardín Botánico Arturo E. Ragonese de Buenos Aires. El curso pretendía revalorizar la ilustración botánica que tristemente está en peligro de extinción en Argentina. Durante el curso que duró dos semanas, a los estudiantes, con conocimiento en el campo del diseño, el dibujo, la ilustración o artes plásticas, se les enseñó a producir una obra en pintura y otra en acuarela. Al final del curso a los estudiantes se les entregó un diploma y se expusieron cuadros de ocho pintores de Argentina. Para más información, ponerse en contacto con: Dra. Ana María Molina, Directora del jardín Botánico "Arturo E. Ragonese", presidente de la red Argentina de jardines botánicos, instituto de recursos biológicos-CHW-INTA-Castelar, Las Cabañas y Los Roseros s.n.; Villa Udaondo,(l 712) Castelar, Buenos Aires, Argentina. Tél.:54 1 621 0840/l. Fax: 54 1 481 2360 Email:ana@cirn.inta.gov.ar

News

students were awarded with a Diploma and an exhibition was held of eight painters from around Argentina. For more information contact: Dra. Ana María Molina, Directora Jardín Botánico 'Arturo E. Ragonese', Presidente Red Argentina de Jardines Botánicos, Instituto de Recursos Biológicos-CIRN-INTA-Castelar, Las Cabañas y Los Roseros s.n., Villa Udaondo, (1712) Castelar, Buenos Aires, Argentina. Tel: (54) 1 6210840/1. Fax: (54) 1 4812360. Email: ana@cirn.inta.gov.ar

AUSTRALIA

Education Programme Up and Running in Albury

Staff from Albury Botanic Gardens have recently undertaken tour guiding and public speaking training and have conducted their first education programme. This new program caters for a wide age-range and is matched to specific curriculum topics and specialised needs. When necessary, Albury staff consult with local educators for advice to keep their education program current and ensure that it meets community needs.

The Friends group at Albury Botanic Gardens, which has been operating for two years, plays an important part in community education. The Friends now have three trained guides who provide assistance to the schools education programme. For further information contact: Albury Botanic Gardens, 700 Smollett Street, Albury NSW 2640, Australia. Tel: (61) 2 60238241 Fax: (61) 2 60416527.

Rare and Threatened Plant Garden at RBG, Sydney

The Royal Botanic Gardens, Sydney has developed a new Rare and Threatened Plant Garden. The garden, which was funded by a grant from the Friends of the Gardens, aims to actively involve visitors in understanding and caring about significant environmental issues. Using imaginative displays, the exhibit seeks to explain what sort of plants are in peril, why plants become endangered, and what can be done to help.

Nouvelles

NOUVELLES DES JARDINS BOTANIKES DU MONDE ENTIER

ARGENTINE

Illustrations botaniques - un art digne de conservation

S'est tenu, en Argentine du 3 au 14 août 1998 au Jardin Botanique Arturo E. Ragonese de Buenos Aires, un stage sur l'illustration botanique. Le stage avait pour but de remettre en valeur les illustrations botaniques, qui sont déplorablement en danger de disparition en Argentine. Durant les deux semaines du stage, les participants, compétents en design, dessin ou arts plastiques ont été dirigés pour réaliser une partie du travail à la peinture et une autre à l'aquarelle. A la fin du stage, un prix a été décerné aux participants et le travail de huit des peintres a été exposé dans tout le pays.

Pour plus d'informations contacter Dra. Ana Maria Molina, directeur du Jardin Botanique Arturo E. Ragonese, Présidente "Red Argentina de Jardines Botánicos", Institut de ressources biologiques-CIRN-INTA-Castelar, Las Cabanas y Los Roseros s.n., Villa Udaondo, (1712) Castelar, Buenos Aires, Argentine. Tél. : 54 1 621 0840/1. Fax : 54 1 481 2360. Email : ana@cirn.inta.gov.ar

AUSTRALIE

Un programme de formation opérationnel à Albury

L'équipe du Jardin Botanique d'Albury a récemment entrepris des excursions guidées et des formations publiques éloquentes. Il a réalisé son premier programme en éducation. Ce nouveau programme convient à une large tranche d'âges et allie à la fois les sujets de programmes d'études et des besoins spécifiques.

Quand cela est nécessaire, l'équipe du Jardin d'Albury consulte les éducateurs locaux pour conseils, afin que ses programmes éducatifs restent d'actualité et correspondent aux besoins de la communauté.

Noticias

AUSTRALIA

El programa de educación que se lleva a cabo en Albury todo un éxito

El personal de Albury Botanic Gardens acaba de realizar una gira turística así como una preparación para hablar en público y, han desarrollado su primer programa de educación. Este nuevo programa ofrece servicios para gente de diversas edades y está destinado a temas específicos del curriculum y a necesidades específicas. Cuando es necesario, el personal de Albury pide consejo a los educadores locales para mantener al día su programa de educación y asegurar que conoce las necesidades de la comunidad.

El grupo "Friends" de Albury Botanic Gardens, que ha estado funcionando durante dos años, juega un papel importante en la educación de la comunidad. "Friends" tiene ahora tres guías en formación que ayudan a los programas de educación en los colegios. Para más información ponerse en contacto con: Albury Botanic Gardens, 700 Smollett Street, Albury NSW 2640, Australia. Tél.: (6) 12 60238241. Fax: (6) 12 60416527.

Jardín de plantas en peligro de extinción, Sydney

El Royal Botanic Gardens de Sydney ha creado un nuevo jardín de plantas raras y maltratadas. El jardín, financiado por una subvención de "Friends of Gardens", quiere involucrar a los visitantes de forma activa en el entendimiento y cuidado de temas medioambientales importantes. Mediante exposiciones imaginativas la exhibición trata de explicar que tipo de plantas corre peligro, porque se distinguen las plantas y que se puede hacer para ayudar. Las notas explicativas y el paseo para ver las plantas en peligro de extinción está desarrollado por guías voluntarios, y por los nuevos "guías verdes", quienes ofrecen las explicaciones en el lugar durante todo el día.

Dentro de la exposición, la primera *Wollemia nobilis*, nacida de una semilla ha sido plantada ¡en una jaula!. Este

■ News

Interpretative signs are supported by an endangered plant walk developed by the volunteer guides, and by the new "green guides", who provide on-site interpretation throughout the day.

Within the display, the first *Wollemia nobilis*, grown from seed has been planted...in a cage! This newly discovered genus, closely related to Jurassic fossils and with only 38 specimens existing, was discovered in a secluded and unexplored gorge. It's not only an invaluable example of a rare plant, but living proof for children that big things (40 metres tall in the case of the wild Wollemi Pines) still exist to be discovered. For further information contact: Royal Botanic Gardens Sydney, Mrs Macquaries Road, Sydney NSW 2000, Australia. Tel: (61) 2 9231 8111. Fax: (61) 2 9251 4403. Internet address: <http://www.rbgsyd.gov.au>

Below:
School children
are able to have
'hands-on'
involvement with
the rare and
threatened plant
garden at RBG-
Sydney.

▲ Nouvelles

L'amicale du Jardin Botanique d'Albury, active depuis deux ans, joue un rôle important dans l'éducation du public. L'amicale a maintenant trois guides formés qui assistent les écoles dans l'élaboration des programmes éducatifs. Pour tout complément d'informations, contacter le Jardin Botanique d'Albury, 700 Smollett Street, Albury NSW 2640, Australie. Tél. : (6) 12 60238241 Fax : (6) 12 60416527.

Jardin de plantes rares et menacées au jardin botanique royal de Sydney

Le Jardin Botanique Royal de Sydney a développé un nouveau JARDIN DE PLANTES RARES ET MENACÉES. Le jardin, fondé avec l'aide financière de l'Amicale du Jardin, a pour but d'impliquer le public dans la compréhension et l'intérêt des enjeux de l'environnement. A l'aide

● Noticias

género descubierto recientemente e íntimamente relacionado con los fósiles jurásicos y con solo 38 especies existentes, fue descubierto en una garganta aislada e inexplorado. No es solo un ejemplo imposible de valorar de una planta rara, sino una prueba real para los niños de que las cosas grandes (40 metros de alto en el caso de los salvajes pinos Wollemi) todavía están por descubrir. Para más información ponerse en contacto con: Royal Botanic Gardens Sydney, M-rs Macquaries Road, Sydney NSW 2000, Australia. Tél. (02)9231 81 11. Fax: (02) 9251 4403. Dirección de Internet: <http://www.rbgsyd.gov.au>

BÉLGICA

El Jardín Botánico Nacional mejora su imagen

En la mesa de dibujo del Nationale Plantentuin van België hay unos planos magníficos; y el cambio de los tres techos del invernadero que, cubren un área de 2.200 m, es uno de los mejores proyectos que se van a realizar. Este proyecto incluirá también la reorganización completa del interior de los invernaderos y por primera vez en 50 años, un informe de la colección de la planta. Además el jardín propone el desarrollo de una casa seca, una casa evolutiva y una casa del sur de China. La educación y el desarrollo de los programas públicos tomará gran parte en este desarrollo. El Nationale Plantentuin van België también ha desarrollado y dirigido el primer curso nacional para guías de jardines botánicos y este curso ha sido aceptado de manera grata por los asistentes. Para más información ponerse en contacto con: Nationale Plantentuin van België, Domein Van Bouchout, 1860 Meise, Bélgica. Tél: (0) 2 269 3905. Fax: (0) 2 270 1567.

CHINA

Preparando a monjes budistas en los jardines botánicos tropicales de Xishuangbanna

En Xishuangbanna, al sur de Yunnan, los indígenas Dai y la gente de Bulan cree en el Budismo de Hinayana. Cada pueblo tiene un templo budista y



BELGIUM

National Botanic Garden Gets a Face-Lift!

Exciting plans are on the drawing board for Nationale Plantentuin van

d'expositions imaginatives, les présentations tentent d'expliquer quels types de plantes sont en péril, pourquoi les plantes sont en danger et ce qu'il est possible de faire pour pallier le problème (pour les aider!). Un

News

Belgie and replacing the three glass house roofs covering an area of 2200m is one of the major projects that will be undertaken. This project will also involve completely reorganising the interior of the glasshouses and, for the first time in 50 years, a review of the plant collection. In addition, the garden proposes to develop a dry house, an evolutionary house and a south Chinese house. Education and the development of public programmes will play a big part in this development. The Nationale Plantentuin van Belgie has also developed and conducted the first national course for botanic garden guides and this course has been well received by participants. For further information contact: Nationale Plantentuin van Belgie, Domein van Bouchout, 1860 Meise, Belgium. Tel: (32) 2 269 3905 Fax: (32) 2 270 1567.

CHINA

Training Buddhist Monks at Xishuangbanna Tropical Botanical Gardens

In Xishuangbanna, south of Yunnan, the indigenous Dai and Bulan people believe in Hinayana Buddhism. Every village has a Buddhist temple and, according to Buddhism, every Buddhist temple yard must be planted with some of the specified temple yard plants. In effect, every Buddhist temple yard becomes a botanic garden. Currently, there are about 600 Buddhist temples and 7000 Buddhist monks in Xishuangbanna and therefore teaching and the sharing of knowledge is very important in this area.

Xishuangbanna Tropical Botanic Garden (XTBG), the biggest botanic garden in China, formed its popular educational service in 1996. The Xishuangbanna staff have been studying ethnobotany and the indigenous knowledge for protecting the biodiversity in Xishuangbanna since the early 1980s. Supported by the Ford Foundation, USA, the program of Buddhist plant culture and the restoration of the Buddhist Temple Yard in Xishuangbanna has been carried out since 1993.

Nouvelles

sentier d'interprétation, présentant les plantes menacées, a été mis en place par des guides volontaires et par les nouveaux "guides verts", qui proposent à toute heure de la journée des visites d'interprétation sur le site même. On peut voir exposé, le premier *Wollemia nobilis* obtenu à partir de graines semées en cage ! Ce nouveau genre, apparenté aux fossiles du Jurassique, et dont on ne connaît que 38 spécimens, a récemment été découvert dans un défilé retiré et jusque là inexploré. Ce n'est pas le seul exemple de plante rare présenté, mais c'est la preuve vivante pour les enfants que de grands organismes (40 mètres, dans le cas du *Pin Wollemi*) restent à découvrir. Pour tout complément d'informations contacter le Jardin Botanique Royal de Sydney, Mrs Macquaries Road, Sydney NSW 2000, Australie. Tél. : (02) 9231 8111. Fax : (02) 9251 4403. Site Internet : <http://www.rbgsyd.gov.au>

BELGIQUE

Un nouveau visage pour le Jardin Botanique National

De sensationnels projets sont à l'étude pour le Nationale Plantentuin van Belgie et la réfection des toits des trois surface de 2200 mètres carrés, est l'un des principaux ces projets. Ce projet concerne aussi la réorganisation complète de l'intérieur des serres et pour la première fois depuis 50 ans, un examen des collections vivantes. De plus, le jardin propose de mettre en place une serre à cactées, une serre sur le thème de l'évolution et une autre consacrée aux plantes du sud de la Chine. L'éducation et le développement de programmes pour le public devraient jouer un rôle important dans cette réhabilitation. Le Nationale Plantentuin van Belgie a aussi développé et organisé le premier stage national pour les animateurs de jardins et celui-ci a bien été accueilli par les participants. Pour tout complément d'informations, contacter le Nationale Plantentuin van Belgie, Domein Van Bouchout, 1860 Meise, Belgique. Tél. : (0) 2 269 3905 Fax : (0) 2 270 1567

Noticias

según el Budismo cada metro de un templo budista debe estar plantado con algunas de las plantas específicas para estos templos. De hecho, cada metro de un templo budista se convierte en un jardín botánico. Actualmente existen unos 600 templos Budistas y 7.000 monjes budistas en Xishuangbanna y por lo tanto la enseñanza y el intercambio de conocimientos es muy importante en esta zona.

El jardín botánico tropical de Xishuangbanna (XTBG) es el más grande de China, y estableció su famoso servicio de educación en 1996. El personal de Xishuangbanna ha estudiado etnobotánica y conoce lo autóctono para proteger la biodiversidad en Xishuangbanna desde principios de los años 80. Apoyados por la fundación Ford, U.S.A., el programa de la cultura budista de las plantas y la restauración del Buddhist Temple Yard en Xishuangbanna se ha llevado a cabo desde 1993.

Se acaba de realizar un curso de formación, el tercero de este tipo, para enseñar a los monjes budistas de los grandes templos de Xishuangbanna a plantar en ellos. El curso quiere

Below:
Buddhist abbots
visited an
exhibition during
their training on
*conserving
biodiversity* at
Xishuangbanna
Tropical Botanic
Garden.



■ News

A training course has recently been conducted, the third of its kind, to train Buddhist monks from the larger Buddhist Temples in Xishuangbanna on planting in the temple yard. The course aims to ensure that environmental education is maintained amongst the Buddhist monks and local people. 31 Buddhist monks took part in the training. For more information contact: Xu you kai, Popular Educational Service, Xishuangbanna Tropical Botanic Garden, Chinese Academy of Science, Mengla 666303 Yunnan, China. Tel: (86) 691 8715375 Fax: (86) 691 8715070.

COSTA RICA

The Biodiversity Garden in the Heart of Santo Domingo

The Instituto Nacional de Biodiversidad (INBio), established in 1989, is a private non-profit scientific institution. The mission of the organisation is to promote greater awareness of the value of biodiversity, and thereby its conservation to improve the quality of life for society.

To achieve this mission the institute needed to look at ways to disseminate the information to as many people as possible. Therefore a biodiversity garden was created, and will be opened in 1999. The garden is a recreational and educational place that will inform visitors about Costa Rica's natural resources and national parks. Representative samples of the country's ecosystems will be displayed to illustrate biodiversity.

Permanent displays on Costa Rica's biodiversity, as well as INBio's activities, will be interpreted. The garden will also include an outdoor area with interpreted nature trails and live collections of several species, where visitors can enjoy nature in the heart of Santo Domingo de Heredia. The garden will target a broad range of visitors including school and university students, adults, local families and overseas tourists.

For further information contact:
Instituto Nacional de Biodiversidad
AA 22-3100, Santo Domingo,

▲ Nouvelles

CHINE

Formation de moines bouddhistes au jardin botanique tropical de Xishuangbanna

Dans la province Xishuangbanna, au sud Yunnan, les peuplades Dai et Bulan pratiquent le Bouddhisme Hinayana. Chaque village possède un temple bouddhiste et, selon la religion, les cours des temples doivent être plantées de plantes spécifiques. Ainsi, chaque cour de temple est un véritable jardin botanique. Actuellement, il existe à peu près 600 temples de ce genre et 7000 moines bouddhistes à Xishuangbanna et par conséquent l'enseignement et le partage des connaissances est très important dans cette région.

Le Jardin Botanique Tropical de Xishuangbanna (XTBG), le plus important de Chine, a formé son personnel éducatif en 1996. L'équipe de Xishuangbanna a étudié l'ethnobotanique et la connaissance populaire pour, très tôt protéger la biodiversité à Xishuangbanna, depuis les années 80. Soutenu par la fondation américaine Ford, le programme de culture des plantes "bouddhistes" et de restauration de la cour du temple de Xishuangbanna a pris fin depuis 1993.

Un stage, le troisième de ce type, a récemment été mis en place pour former une grande partie des moines de la région de Xishuangbanna à la plantation dans les cours des temples. Le stage a pour but d'assurer le maintien de l'éducation à l'environnement chez les moines et la population locale. 31 moines ont pris part à ce stage.

Pour plus d'informations contacter Xu you kai, Service éducatif, Jardin Botanique de Xishuangbanna, Chinese Academy of Science, Mengla 666303 Yunnan, Chine, Tél : 86 691 8715375 Fax : 86 691 8715070

● Noticias

asegurar que la educación medioambiental se mantiene entre los monjes budistas y la gente de la localidad. A la formación asistieron 31 monje budista. Para más información contactar con Xu you Kai, Servicio Educativo popular, Xishuangbanna tropical Botanic Garden, Academia China de Ciencias, Mengla 666303 Yunnan, China. Tél: 86 691 8715375. Fax: 86 691 8715070.

COSTA RICA

El Jardín de la Biodiversidad en el corazón de Santo Domingo

El Instituto Nacional de Biodiversidad (INBio) establecido en 1989, es una institución científica privada no lucrativa. La misión de la organización es promover un conocimiento más amplio del valor de la biodiversidad, y de éste modo su conservación para mejorar la calidad de vida de la sociedad.

Para conseguir su misión el instituto necesitaba investigar las formas para difundir la información al mayor número de personas posible. Por lo tanto se creó un jardín de Biodiversidad que se abrirá en 1999. El jardín es un lugar educativo y recreativo que informará a los visitantes sobre los recursos naturales y los parques nacionales de Costa Rica. Se expondrán muestras representativas de los ecosistemas del país para ilustrar la biodiversidad.

Las exposiciones permanentes sobre la biodiversidad de Costa Rica así como actividades del INBio serán interpretadas. El jardín incluirá también una zona al aire libre con un sendero natural explicado y colecciones vivas de varias especies, donde los turistas pueden disfrutar de la naturaleza en el corazón de Santo Domingo de Heredia. El Jardín elegirá un amplio grupo de turistas, colegios, estudiantes universitarios, adultos, familias de la zona y turistas extranjeros. Para una información más detallada ponerse en contacto con el Instituto Nacional de Biodiversidad AA 22-3 1 00, Santo Domingo, Heredia Costa Rica. Tél.: (506) 244 2816. Fax: (506) 244 2816.

News

Heredia Costa Rica.
Tel: (506) 244 2816
Fax: (506) 244 2816.

FRANCE

Influencing the School Curriculum Through Partnerships

Le Conservatoire Botanique National de Mascarin has formed a partnership with two neighbouring schools with the aim of integrating environmental education into the school curriculum. The partnership enables the schools to visit the Conservatoire without booking and the children are entitled to free entry during opening hours and school time. The children are encouraged to use the Conservatoire and its scientific, cultural and historic resources. In addition they are able to take advantage of the exhibitions and use the library.

As part of this partnership and with the assistance of cultural funding, the Conservatoire has developed a pilot programme using professional artists to perform activities on environmental themes that complement the school curriculum and the objectives of the Conservatoire. For further information contact: Conservatoire Botanique National de Mascarin, Domaine des Colimacons F97436 Saint Leu, Ile de la Reunion. Tel: 19 (262) 249227 Fax: 19 (262) 248563.

ITALY

Summer Fun and Education in the Trento Region

During the summer of 1998, for the first time, educational activities for tourists were conducted in Viotte Alpine Botanic Garden and Arco Arboretum. The activities aimed to increase awareness of the two cultural institutions and their role in conservation and research, as well as to entertain the public.

In Viotte a treasure hunt was organised that consisted of a series of hands-on activities including painting, blindfolding participants to encourage sensory use, and preparing perfume, oils and

Nouvelles

COSTA RICA

Le jardin de la biodiversité au coeur de Santo Domingo

L'Institut National de Biodiversité (INBio), fondé en 1989 est une institution scientifique privée à but non lucratif. La vocation de cette organisation est de promouvoir la prise de conscience de la valeur de la biodiversité et de cette façon sa conservation pour améliorer la qualité de la vie.

Afin de remplir son rôle, l'institut a besoin de trouver tout les moyens susceptibles de faire passer l'information aux plus de gens possibles. Ainsi, un Jardin de la Biodiversité a été créé et ouvrira ses portes en 1999. Le jardin, endroit récréatif et éducatif informera le public sur les ressources naturelles du Costa Rica et sur ses parcs nationaux. Des exemples représentatifs d'écosystèmes du pays seront présentés pour illustrer la biodiversité.

En plus des activités du INBio, une exposition permanente sur la biodiversité du Costa Rica, sera commentée. Le jardin présentera aussi, à l'extérieur, un sentier d'interprétation et une collection de quelques plantes, où les visiteurs pourront profiter de la nature en plein cœur de Saint Domingo de Heredia. Le jardin s'adresse à une large gamme de visiteurs comprenant les scolaires, les étudiants, les adultes, les locaux et les étrangers. Pour de plus amples informations contacter l'Institut National de la Biodiversité AA22-3100, Saint Domingue, Heredia Costa Rica. Tél. : (506) 244 2816 Fax : (506) 244 2816

FRANCE

Influencer le cursus scolaire grâce à des partenariats

Le Conservatoire Botanique National de Mascarin vient de passer un accord avec deux écoles avoisinantes pour intégrer l'éducation à l'environnement dans les programmes d'études scolaires. Ce partenariat permet aux écoles de visiter le Conservatoire sans réservation et les élèves sont autorisés

Noticias

FRANCIA

Influencia de las asociaciones en el currículo escolar

El Conservatoire Botanique Nationale de Mascarin ha constituido una asociación con dos colegios cercanos con el propósito de integrar la educación medioambiental en el curriculum escolar. La asociación permite a los colegios visitar el Conservatoire sin necesidad de hacer reservas y los niños pueden entrar gratis durante las horas de apertura y temporada escolar. A los niños se les anima a que utilicen el Conservatoire y sus recursos científicos, culturales e históricos. Además pueden sacar partido de las exhibiciones y usar la biblioteca.

Como parte de esta asociación y con ayuda de becas culturales, el conservatoire ha desarrollado un programa piloto que utiliza artistas profesionales para realizar actividades sobre temas medioambientales que complementen el curriculum escolar y los objetivos del Conservatoire. Para más información ponerse en contacto con: Conservatoire Botanique National de Mascarin, Domaine des Colimacons F97436 Saint Leu, Ile de la Reunion. Tel.: 19 (262) 249227. Fax: 19 (262) 248563.

ITALIA

Juegos veraniegos y educación en la región de Trento

En el verano de 1998 se llevaron a cabo por primera vez una serie de actividades educativas para turistas en el Jardín Botánico Viotte Alpine y en el Arco Arboretum. El propósito de estas actividades consistía en concienciar aún más a estas dos instituciones culturales de su papel en la investigación y protección del medio ambiente, aunque también se perseguía entretener a los visitantes.

Se organizó una búsqueda del tesoro en el parque Viotte, en el que se incluían una serie de actividades manuales como la pintura. A los participantes se les vendaban los ojos

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creams. In Arco the old local traditions were brought back to life when visitors were involved in making brooms using palm fronds and flutes using bamboo stems. After the great success of these activities, it is proposed to offer this programme again.



Above:
Children taking
part in the
holiday activities
at Arboreto of
Arco.

For further information contact:
Fiorenza Tisi and Costantino Bonomi,
Museo Tridentino di Scienze Naturali,
via Calepina 14- I 38100 Trento, Italy.

PARAGUAY

Connecting Ethnobotany and Education

Ethnobotanica Paraguaya is a collaborative project between Geneva's Botanic Garden Switzerland, the botanic gardens in Asuncion, Paraguay and Paraguayan non-governmental organisations. This project is financed by the Development Aid Foundation in Geneva and based on sustainable development methodology. The project involves connecting ethnobotany and education. Activities include undertaking a taxonomic census and restoring ethnobotanical data concerning medicinal plants sold in the markets of Asuncion in Paraguay (1/4 of the Asuncion market is dedicated to medicinal plants in various forms). The project also looks at development in public healthcare, agronomy and conservation. It will include pharmaceutical and toxicity evaluation in situ. Environmental education will be used to convey messages about the situation in Paraguay and teach people how they may safely use medicinal plants in their everyday lives.

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à y venir durant les heures ouvrables et le temps des classes. Les enfants sont encouragés à profiter du Conservatoire et de ses ressources scientifiques, culturelles et historiques. De plus, ils peuvent aussi jouir des expositions et de la bibliothèque. Parallèlement à ce partenariat, le Conservatoire aidé par un financement culturel, développe un programme pilote où des artistes professionnels réalisent des activités sur le thème de l'environnement afin de compléter l'enseignement scolaire et celui du Conservatoire.

Pour toute information complémentaire contacter le Conservatoire Botanique National de Mascarin, Domaine des Colimaçons F 97436 Saint Leu, Ile de la Réunion. Tél. : 19 (262) 249227 Fax : 19 (262) 248563.

ITALIE

Activités estivales de formation et de loisirs dans la région de Trente

Durant l'été 1998, pour la première fois, des activités éducatives pour les touristes ont été réalisées dans le Jardin Botanique alpin de Viotte et l'Arboretum d'Arco. Les activités avaient pour but d'éveiller la prise de conscience de ces deux institutions culturelles, de leurs rôles dans la conservation, la recherche, en plus de divertir le public.

Une chasse au trésor était organisée dans Viotte, consistant en une série d'activités manuelles, comme la peinture, la préparation de parfums, d'huiles et de crèmes. Les participants avaient les yeux bandés afin d'encourager les autres sens. A Arco les vieilles traditions locales reprenaient naissance quand les visiteurs participaient à la fabrication de balais avec des feuilles de palmier, de flutes avec des tiges de bambous. Après la grande succès de ces activités, il a été proposé de reconduire ce programme.

Pour de plus amples informations contacter Fiorenza Tisi, Museo Tridentino di Scienze Naturali, via Calepina 14- I 38100 TRENTO.

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y se les animaba a utilizar los otros sentidos, así como a preparar perfumes, aceites y cremas. En el Arco Arboretum se rescataron antiguas tradiciones locales, gracias a lo cual los participantes podían fabricar escobas con hojas de palma o flautas con tallos de bambú. Debido al gran éxito de esta iniciativa, se está estudiando la posibilidad de repetirla en una próxima ocasión. Si desea más información, contacte con: Fiorenza Tisi y Constantino Bonomi, Museo Tridentino di Scienza Naturali, via Calepina 14- 138100, Trento.

PARAGUAY

Conectando la etnobotánica y la educación

Ethnobotanica Paraguaya es un proyecto de colaboración entre el Jardín Botánico de Ginebra, los jardines botánicos de Asunción (Paraguay) y las organizaciones no gubernamentales de ese país. Financiado por la Fundación de Ayuda al Desarrollo de Ginebra, se basa en una metodología de desarrollo sostenible. El proyecto establece una conexión entre la etnobotánica y la educación. Entre las actividades se incluyen la elaboración de un censo taxonómico y la recuperación de los datos etnobotánicos relativos a las plantas medicinales que se venden en los mercados de Asunción (1/4 del mercado de la ciudad se dedica a la venta de plantas medicinales en todas sus variantes). También se incluirá una evaluación in situ, tanto farmacológica como toxicológica. La educación medioambiental también será útil a la hora de conocer la situación en Paraguay y de enseñar a la gente cómo hacer un buen uso de las plantas medicinales en la vida diaria. El proyecto aspira asimismo a una mejora de la sanidad pública, la agronomía y la conservación del medio ambiente.

SUDÁFRICA

Aprendizaje y oportunidades para futuros botánicos

El Natal Herbarium de la ciudad de KwaZulu-Natal ha llevado a cabo un

News

For further information contact:
CREPA, Case Postale 16, CH-1933
Sembrancher, Switzerland.
Fax: (41) 27 7822220 or Didier Roguet
Conservatoire et Jardin Botaniques,
Case Postale 60, CH-1292 Geneve,
Switzerland. Fax: (41) 224 185101.

SOUTH AFRICA

Apprenticeships and Opportunities for Aspiring Botanists

Natal Herbarium in KwaZulu-Natal has developed a biannual training programme for botany students, funded through the National Botanical Institute's Affirmative Action Programme. Four third-year botany students from local universities are invited to attend. Each two-week programme includes: theory of plant systematics; plant diversity and ethnobotany; discussions on environmental organisations and careers in botany; field work; using the herbarium and library; and training in herbarium techniques. Students have the opportunity to put herbarium techniques into practice during the programme, gaining valuable experience in a botanical workplace.

For further information contact:
Rosemary Williams and Alfred Ngwenya, Natal Herbarium, National Botanical Institute, Botanic Gardens Road, Durban, South Africa 4001.



Nouvelles

PARAGUAY

Mettre en relation l'ethnobotanique et la formation

Etnobotanica Paraguaya est un projet de collaboration entre le jardin botanique de Genève et les jardins botaniques d'Asuncion au Paraguay et des organisations non gouvernementales paraguayennes. Ce projet, financé par le fond d'aide au développement à Genève est basé sur une méthodologie contribuant au développement durable.

Le projet fait le lien entre l'ethnobotanique et l'éducation. Les activités incluent un recensement taxonomique et une remise à jour des données ethnobotaniques concernant des plantes médicinales vendues sur les marchés d'Asuncion au Paraguay (1/4 du marché d'Asuncion est dédié aux plantes médicinales sous des formes variées.). Le projet inclura une évaluation du potentiel pharmaceutique et de la toxicité in-situ. L'éducation à l'environnement sera utilisée pour faire passer des messages sur la situation au Paraguay et pour enseigner aux populations la manière dont elles peuvent utiliser les plantes médicinales dans leur vie de tous les jours. Le projet vise aussi à un développement de la santé public, de l'agronomie et de la conservation.

AFRIQUE DU SUD

Apprentissage et opportunité pour les botanistes aspirants

L'Herbarium de KWAZULU-NATAL a développé un programme de formation semestriel pour les étudiants en botanique, financé par l'intermédiaire du programme National Botanical Institute's Affirmative Action. 4 étudiants de troisième année, d'universités locales ont été invités à s'inscrire. Chaque programme semestriel de deux semaines comprend la systématique des plantes, biodiversité végétale et ethnobotanique, débats sur les organisations environnementales et les carrières botaniques, les domaines d'investigation, recherches bibliographiques et recherches dans un

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programa de instrucción bianual dirigido a estudiantes de botánica y financiado por el Programa de Discriminación Positiva (Affirmative Action Programme) del Instituto Nacional de Botánica. En dicho programa participan cuatro estudiantes de tercer año de botánica de las distintas universidades locales. Cada programa, que tiene una duración de dos semanas, incluye los siguientes temas: "teoría de la sistemática de las plantas"; "la diversidad vegetal y la etnobotánica"; "debates sobre las organizaciones medioambientales y los estudios de botánica"; "el campo de trabajo"; "Como utilizar el herbario y la biblioteca y "enseñanza de técnicas de herbario". Durante el programa los estudiantes tendrán la oportunidad de poner en práctica las técnicas de herbario, consiguiendo así una valiosa experiencia en el campo de la botánica.

Si desea más información, puede contactar con: Rosemary Williams y Alfred Ngwenya, Natal Herbarium, National Botanical Institute, Botanic Gardens Road, Durban, South Africa 4001.

Fondos de la UNESCO destinados a jardines botánicos

El Jardín Botánico Nacional de la ciudad de Pretoria (Sudáfrica) ha aplicado con éxito los Fondos del Programa de Participación de la UNESCO. Gracias a su Programa de Educación Pedagógica para los años 1999 y 2000, el centro ha sido galardonado con la cantidad de 23000 dólares americanos. Se celebrarán una serie de reuniones en zonas cercanas a Johannesburgo y Pretoria que contarán con la asistencia de especialistas del Departamento de Educación. El objetivo de estas reuniones será el de informar a los expertos de los parámetros del proyecto, así como desarrollar una serie de talleres para profesores.

Para más información, dirijase a: Alexis Symonds, Head of Education (northern gardens), Pretoria National Botanical Garden, National Botanical Institute,

Left:
Nobuhle Moloi
(University of
Zululand) and
Alfred Ngwenya
(Natal Herbarium)
undertake field
work at Monteseel
as part of
Nobuhle's practical
training.

■ News

UNESCO Funding for Botanic Gardens

The Pretoria National Botanical Garden, South Africa has been successful in its application to the UNESCO Participation Programme Funding. It has been awarded \$23,000 for its Teacher Education Programme during 1999 and 2000. A series of meetings will be held, in districts around Johannesburg and Pretoria, with various subject advisors from the Department of Education. The aim of the meetings will be to inform the advisors of the parameters of the project and to develop a series of workshops that will be of benefit to teachers. For further information contact: Alexis Symonds, Head of Education (northern gardens), Pretoria National Botanical Garden, National Botanical Institute, Private Bag X101, Pretoria 0001, South Africa.
Tel: (27) 12 804 3200.
Fax: (27) 12 804 3211.

UNITED KINGDOM

The Caribbean Comes to England!

A programme of lectures and activities was arranged for summer 1998 in the newly constructed Caribbean Garden at the Museum of Liverpool Life. The garden was built on the Liverpool waterfront to commemorate the 50th anniversary of the arrival of Caribbean emigrants in Britain.

The garden, maintained by the Friends of the Maritime Museum, showed a selection of plants that are used in the Caribbean for food, medicine and materials. A video highlighting the experiences of some of the emigrants was produced to support the exhibition. The exhibition is proposed to return in June 1999. For further information contact: Caribbean Garden, Museum of Liverpool Life, Pier Head Liverpool L3 1PZ, UK.
Tel: (44) 151 478 4427
Fax: (44) 151 478 4533.

A New Study Centre for Birmingham

In recent years the further development of the Birmingham Botanical Gardens education programs has been

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herbarium, formation aux techniques d'herbarium. Les étudiants ont l'opportunité de mettre en pratique ces techniques, en travaillant dans un institut botanique : expérience de grande valeur. Pour toute information contacter Rosemary Williams et Alfred Ngwenya, Natal Herbarium, Institut Botanique National, Botanic Gardens Road, Durban, Afrique du Sud 4001.

Financement UNESCO pour les jardins botaniques

La candidature à l'aide financière de l'UNESCO (UNESCO Participation Programme Funding) du Jardin Botanique National de Pretoria, en Afrique du Sud a été retenue. Il lui a été alloué 23 000 dollars répartis sur 1999 et 2000, pour son programme éducatif pour enseignants (Teacher Education Programme). Une série de réunions aura lieu dans les régions de Johannesburg et de Pretoria avec les divers conseillers des services éducatifs. Les réunions informeront les conseillers sur les paramètres du projet et le développement d'une série d'ateliers au bénéfice des enseignants.

Pour toute information complémentaire contacter Alexis Symonds, responsable de l'éducation (Jardins Nord), jardin Botanique National de Pretoria, Institut Botanique National, Private Bag X101, Pretoria 0001, Afrique du Sud.
Tél: 27 (0) 12 804 3200
Fax: 27(0) 12 804 3211.

ROYAUME-UNI

Les caraïbes débarquent en Angleterre

Un programme de conférences et d'activités est mis en place pour l'été 98 dans le nouveau Jardin des Caraïbes du Muséum d'Histoire Naturelles de Liverpool. Pour commémorer le 50ème anniversaire de l'arrivée des émigrants antillais en Angleterre, le jardin a été construit en bord de mer. Le jardin entretenu par l'Amicale du Musée Maritime montre une sélection de plantes utilisées aux Antilles comme nourriture, matériel de construction et pour leurs vertus médicinales. Une vidéo mettant en valeur l'expérience de quelques

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Private Bag X101, Pretoria 0001, South Africa. Tel: 27 (0) 12804 3200.
Fax: 27 (0) 12804 3211

REINO UNIDO

El Caribe llega a Inglaterra

En el verano de 1998 se organizó un programa de actividades y conferencias en el recientemente construido Caribbean Garden, sito en el Museo de la Vida de Liverpool. El jardín se edificó en la zona costera de Liverpool para conmemorar el 50 aniversario de la llegada de los emigrantes caribeños a Gran Bretaña.

En el centro, costado por la fundación "Frinds of the Maritime Museum", se exhibió una selección de plantas utilizadas en la zona del Caribe para la cocina, la salud y como materia prima. Los asistentes pudieron asimismo ver un vídeo en el que se muestran las experiencias de algunos emigrantes de la época. Está previsto que la exposición se repita en junio de 1999. Para más información, contacte con: Caribbean Garden, Museum of Liverpool Life, Pier Head, Liverpool L3 1PZ, UK.
Tel: (44) 0151 478 4427
Fax: (44) 0151 478 4533

Un nuevo centro de estudio para Birmingham

El progresivo desarrollo en los últimos años de los programas educativos en el Jardín Botánico de Birmingham se ha visto limitado por la falta de aulas y otras instalaciones. Ese es el motivo de que se decidiera ampliar su servicio educativo construyendo un centro de estudios en el lugar ocupado anteriormente por la vivienda del director, convenientemente emplazado cerca del Jardín Alpino e Histórico. Cuando finalicen las obras en abril de 1999, este centro dispondrá de tres espaciosas aulas, una clase para tutorías y prácticas, un amplio almacén y guardarropa. Las aulas estarán equipadas con microscopios, ordenadores portátiles y dispositivos instalados en las plantas con los que se podrán realizar un gran número de experimentos. Contiguo al aula del segundo piso encontramos un

■ News

constrained by lack of classroom space and associated facilities. The garden has decided to expand its educational service by constructing a much needed study centre on the site of the Curator's cottage conveniently situated next to the Alpine and Historical gardens.

When completed in April 1999, this purpose built centre will provide three spacious classrooms, a tutorial/resources room as well as large storage and cloakroom facilities. The rooms will be equipped with resources including microscopes, portable computers and plant based artefacts to support a wide range of activities. Adjacent to the upstairs classroom is a greenhouse allowing wonderful opportunities for the hands-on development of horticultural skills. For further information contact: Birmingham Botanical Gardens Study Centre, Westbourne Road, Edgbaston Birmingham B15 3TR, UK. Tel: (44) 121 454 0784 Fax: (44) 121 454 7835.

Going Botanical at Bristol Zoo Gardens

Bristol Zoo Gardens is the fifth oldest zoological gardens in the world and its future vision is to further integrate botanical aspects in the zoo's conservation and educational work. In 1999 Bristol Zoo Gardens will open a Conservation Education Centre, which has been carefully designed, taking into consideration its environmental impact. The facilities provided will enable the zoo to expand its educational role to include adult education activities along with expanding the work with schools, colleges and zoo visitors. This will then provide exciting opportunities to experience – both zoological and botanical life, with the aim of instilling a greater respect and understanding of the natural world to ensure a sustainable future.

For further information contact: Education Department, Bristol Zoo Gardens Clifton, Bristol BS8 3HA, UK. Tel: (44) 117 970 6176 Fax: (44) 117 973 6814.

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émigrants accompagne aussi l'exposition. L'exposition prend fin en juin 1999. Pour toute information complémentaire contacter Le Jardin des Caraïbes, Muséum d'Histoire Naturelles de Liverpool, Pier Head Liverpool L3 1PZ, UK. Tél. : (44) 0151 478 4427 Fax (44) 0151 478 4533.

Un nouveau centre d'études pour Birmingham

Ces dernières années, l'aide au développement des programmes éducatifs du Jardin Botanique de Birmingham a été entravée par le manque de place et de moyens. Le jardin a décidé d'étendre son service éducatif par la construction d'un centre d'étude indispensable à l'emplacement de la maison du conservateur, convenablement située près des jardins alpin et historique. Terminé en avril 1999, ce futur centre sera équipé de trois grandes salles d'enseignement, d'une pièce consacrée à la documentation et de locaux de stockage. Les salles seront équipées de microscopes, d'ordinateurs portables et de plantes factices pour toutes sortes d'activités. Une serre attenante aux salles de cours de l'étage permettra de développer les compétences horticoles. Pour toute information contacter Le Centre d'Étude du Jardin Botanique de Birmingham, Westbourne Road, Edgbaston Birmingham B15 3TR, UK. Tél. : 0121 454 0784 Fax : 0121 454 7835

Ballade botanique au zoo de Bristol

Le parc zoologique de Bristol est le 5ème plus ancien parc zoologique du monde et son ambition future est de favoriser l'intégration de l'aspect botanique dans les travaux de conservation et éducatifs du zoo. En 1999, le Parc Zoologique de Bristol ouvrira un Centre d'Éducation à la Conservation (Conservation Education Centre), qui est conçu avec soin en prenant en considération son impact sur l'environnement. Les prestations fournies permettront au parc zoologique d'étendre son rôle éducatif en incorporant des activités éducatives pour les adultes en plus de son travail

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invernadero que ofrece la oportunidad de desarrollar las habilidades en horticultura.

Para más información, puede contactar con: Birmingham Botanical Gardens Study Centre, Westbourne Road, Edgbaston Birmingham B15 3TR, UK. Tel:0121 454 0784 Fax:0121 454 7835

Un acercamiento a la botánica en el parque zoológico de Bristol

Este zoológico es el quinto más antiguo del mundo y tiene previsto incluir algunas cuestiones relativas a la botánica dentro de su labor educativa y de protección del medio ambiente. En el año 1999, el zoo inaugurará un centro educativo para la conservación del medio ambiente cuidadosamente diseñado para minimizar el impacto ecológico. Las nuevas instalaciones permitirán al zoo ampliar su papel pedagógico e incluir así actividades educativas dirigidas tanto a adultos como a escuelas, institutos y visitantes en general. Con ello se ofrecerá la oportunidad de experimentar la vida real, tanto zoológica como botánica, con el objetivo de inculcar un mayor respeto y comprensión por la naturaleza y asegurar así un futuro mejor. Para más información, dirigirse a: Education Department, Bristol Zoo Gardens, Clifton, Bristol BS8 3HA, UK. Tel: (0117) 970 6176 Fax: (0117) 973 6814

Below:
This concept drawing for the new education centre at Birmingham illustrates the centre's size - there will certainly be wonderful opportunities for a variety of programs using these facilities.



■ News

On the Trail of Genetic Engineering

Chelsea Physic Garden has produced a trail around their culinary and medicinal plant collections to address the controversies surrounding genetic engineering. Aimed at the general public, this is one of a series of trails that is deliberately issues-based. It encourages visitors, and also garden managers, to see their collections as resources to teach about social and ethical issues as well as the public understanding of science. A brochure has been designed for the trail and it addresses issues affecting the production of food crops, dyed cloth, vaccines and pharmaceuticals of which the garden has major displays. For further information contact: The Chelsea Physic Garden, 66 Royal Hospital Road, London SW3 4HS UK. Tel: (44) 171 352 5646 Fax: (44) 171 376 3910.

UNITED STATES

Garden Develops New Badge for Girl Scouts

Staff at Fairchild Tropical Garden are collaborating with the US Girl Scouts on a project funded by the Florida Advisory Council on Environmental Education and entitled Tropical Heritage. The project aims to further girl scouts' love and understanding of the plants that sustain the fragile south Florida ecosystem. Scouts who complete the required activities will earn a conservation badge. The activities will involve conducting a plant inventory, removing exotic species, reintroducing native species and monitoring conservation efforts. Fairchild and the Girl Scout project team have developed information to be used in leader training and pilot programmes. Nationally the Girl Scout organisation will be able to modify Tropical Heritage for all local environments throughout the US.

For further information contact: Fairchild Tropical Garden 10901 Old Cutler Road, Miami, Florida 33156-4296 USA. Tel: (1) 305 6671651 Fax: (1) 305 6618953.

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avec les écoles, les lycées et les visiteurs du zoo. Ceci fournira alors de sensationnelles opportunités pour sentir la vie, à la fois zoologique et botanique dans le but d'inculquer un plus grand respect et la compréhension du monde naturel pour en assurer une future gestion raisonnée. Pour de plus amples informations contacter le service éducatif du parc zoologique de Bristol, Bristol Zoo Gardens Clifton, Bristol BS8 3HA, UK
Tél. : (0117) 970 6176
Fax : (0117) 973 6814

Sur la voie du génie génétique

Le Chelsea Physic Garden a établi un sentier dans ses collections de plantes culinaires et médicinales pour répondre aux controverses sur le génie génétique. Destiné à public, c'est un exemple d'une série, délibérément basé sur les informations médiatiques. Il incite les visiteurs mais aussi les gestionnaires des jardins à voir les collections comme des moyens d'informer sur les problèmes sociaux et éthiques ainsi que sur la compréhension des sciences pour le public. Une brochure a été conçue pour le sentier. Elle présente des considérations sur la production des céréales, de vêtements, de vaccins, de produits pharmaceutiques, dont le jardin est la meilleure représentation.

ÉTATS-UNIS

Le jardin crée un nouvel écusson pour les filles scouts

L'équipe du Jardin Tropical de Fairchild collabore avec les girl scouts américaines à un projet, financé par la Florida Advisory Council (Le Conseil Consultatif de Floride), sur l'éducation à l'environnement dénommé Tropical Heritage (Héritage tropical). Le projet a pour but d'encourager les jeunes filles à l'amour et à la compréhension des plantes qui font partie du fragile écosystème du sud de la Floride. Les scouts qui parviennent à réaliser toutes les activités gagnent un insigne de conservation. Les activités comprendront : un inventaire floristique, l'arrachage des plantes exotiques, la réintroduction d'espèces

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Tras la pista de la ingeniería genética

El Parque de la Física de la ciudad de Chelsea hace un recorrido por sus colecciones de plantas medicinales y de uso culinario con el fin de aclarar la controversia que rodea a la ingeniería genética. Dirigido al público general, forma parte de una serie de actividades cuyo objetivo es animar & los visitantes y a los directores de otros parques a ver las colecciones como un instrumento para enseñar sobre temas sociales y éticos, así como para la comprensión de la ciencia por los no entendidos. Se ha diseñado un folleto que trata temas relacionados con la producción de cosechas, los tejidos teñidos, las vacunas y productos farmacéuticos, de los cuales el parque posee una importante colección. Si desea más información, puede contactar con: The Chelsea Physic Garden, 66 Royal Hospital Road, London SW3 4HS, UK. Tel:(0171)352 5646 Fax:(0171)376 3910

ESTADOS UNIDOS

Desarrollo de jardines – Nueva insignia para las exploradoras (Girl Scouts)

El personal del Parque Tropical Fairchild colabora con grupos de exploradoras (Girl Scouts) en un proyecto llamado "Tropical Heritage" (la Herencia Tropical), financiado por el Consejo Consultivo sobre Educación Medioambiental de Florida. Su objetivo es fomentar el amor y el respeto de las chicas por las plantas que sustentan el frágil ecosistema del sur de Florida. Todas aquellas que completan las actividades establecidas obtendrán una insignia de reconocimiento. Entre las actividades se incluyen la realización de un inventario vegetal, la extracción de especies exóticas, la reintroducción de especies autóctonas y el control de los esfuerzos de conservación. Gracias a este proyecto conjunto se ha conseguido información que podrá ser utilizada en cursos pedagógicos especializados y programas piloto. La organización de las girl scouts tiene previsto adaptar

News

TRAINING

Masters Degrees in Environmental Education have been developed in Chile and Mexico. The study plan in Chile runs for three years, with the first two years dedicated to course work and the third year to the submission of a thesis.

In Mexico, the course is being offered by the Universidad de Guadalajara. This course can be undertaken externally and its purpose is to train professionals in the knowledge and use of research methods in education and social fields. For further information contact: Universidad de Playa Ancha de Ciencias de la Educacion, Av. Gran Bretana No. 50 Playa Ancha, Casilla 34-V Valparaiso Chile and Universidad de Guadalajara, centro de Educacion Continua y Abierto, Calle Escuela Militar de Aviación No. 16, entre hidalgo y Morelos, Guadalajara, Jal., Mexico.

APPOINTMENTS

Dawn Sanders has been appointed as the first Education Co-ordinator for the Botanic Gardens Education Network (BGEN) UK. Dawn works at the Chelsea Physic Garden and will be dividing her time working part time for both Chelsea and BGEN. Her role with BGEN will involve co-ordinating and developing the botanic gardens network in the UK including the editing of the newsletter Fronds. For further information contact: 2 Grovelands Close, Camberwell, London SE5 8JN, UK.

Nouvelles

indigènes et le contrôle des tentatives de conservation. L'équipe du projet Tropical Heritage développe l'information afin que le projet puisse être utile aux formations et programmes pilotes. A l'échelle nationale, l'organisation des girl scouts est capable de modifier le projet pour l'adapter à tous les environnements locaux des États-Unis. Pour complément d'information contacter le Jardin Tropical Fairchild, 10901 Old Culter Road, Miami, Florida 33156-4296 USA. Tél. : (305) 667 1651 Fax : (305) 661 8953.

FORMATION

Des diplômes d'enseignement supérieur sur l'éducation à l'environnement se mettent en place au Chili et au Mexique. Au Chili, le diplôme se prépare en trois ans, deux années pour réaliser le travail et la dernière consacrée à la présentation de la thèse.

Au Mexique, le cours est proposé par l'Université de Guadalajara. Le cours peut être suivi par correspondance et son but est la formation des professionnels dans la connaissance et l'utilisation de méthodes de recherche en éducation et domaines sociaux. Pour plus d'informations contacter l'université Playa Ancha de Ciencias de la Educacion, Av. Gran Bretana No. 50 Playa Ancha, Casilla 34-V Valparaiso, Chili et Université de Guadalajara, centro de Educacion Continua y Abierto, Calle Escuela Militar de Aviacion No. 16 entre hidalgo y Morelos, Guadalojara, Jal., Mexico.

NOMINATION

Dawn Sanders vient d'être nommée coordonnateur de l'Éducation pour le Réseau Éducatif des Jardins Botaniques (BGEN), au Royaume-Uni. Dawn travaille au Chelsea Physic Garden et partage son temps de travail entre Chelsea et le BGEN. Son rôle au BGEN sera d'améliorer la coordination et le développement du réseau des jardins botaniques au Royaume-Uni, ainsi que d'éditer le bulletin Fronds. Pour plus d'informations contacter 2 Grovelands Close, Camberwell, London SE5 8JN, UK.

Noticias

este proyecto a cada uno de los ecosistemas locales de todo el país. Para más información, contacte con: Fairchild Tropical Garden 10901 Old Cutler Road, Miami, Florida 33156-4296 USA. Tel: (305) 667 1651 Fax: (305) 661 8953.

EL ENTRENAMIENTO

Chile y Méjico han sido los países elegidos para celebrar un máster en educación medioambiental. En Chile, el plan de estudio dura tres años, de los que los dos primeros se dedican a trabajo en clase y el tercero a la presentación de una tesis. En Méjico, el curso se imparte en la Universidad de Guadalajara, y la asistencia no es obligatoria. Su objetivo es introducir a los profesionales en el conocimiento y la utilización de métodos de investigación en un campo tanto social como educativo.

Si desea más información, dirijase a: Universidad de Ciencias de la Educación de Playa Ancha, Av. Gran Bretaña nº50, Playa Ancha, Casilla 34-V Valparaiso, Chile. a: Universidad de Guadalajara, Centro de Educación Continua, Calle Escuela Militar de Aviación nº 16, entre Hidalgo y Morelos, Guadalajara, Jal. México.

NOMBRAMIENTOS

Dawn Sanders ha sido nombrada coordinadora de la Red de Educación de Jardines Botánicos (BGEN) en el Reino Unido. A partir de ahora, la señora Sanders tendrá que compaginar su trabajo en el Physic Garden de Chelsea con su nuevo puesto en la BGEN. Su cometido en dicha institución será el de coordinar y perfeccionar la red de jardines botánicos de todo el Reino Unido. Asimismo, será la responsable de la edición del boletín interno "Fronds". Si desea más información, contacte con: 2 Grovelands Close, Camberwell, London SE5 8JN, UK.

Education for sustainability: Some Questions for Reflection

Introduction

It was the Earth Summit, the United Nations Conference on Environment and Development (UNCED), held in Rio de Janeiro in 1992, which alerted the world to the complex nature of the issues underlying environmental sustainability. Perhaps, the most pertinent, was the increasing divergence between the northern 'environment' agenda and the 'development' agenda shared by the poorer nations. Many countries who were eager for economic development used the Summit to bring the world's attention to the stark choices they face between development, environmental protection and the need to overcome poverty. However, the realisation at Rio that the existing development trends leave increasing numbers of people poor and vulnerable served to redefine and clarify the links between environment and development concerns.

Those present at the Summit saw the need to tie the achievement of environmental sustainability with overcoming the interdependent problems of poverty, illiteracy and militarism. Elizabeth Dodswell, the former Executive Director of the United Nations Environment Programme (UNEP), has highlighted the new vision of sustainability emerging from the Earth Summit:

'The Earth Summit at Rio de Janeiro saw the essential indivisibility of environment, peace and development. It also recognised that global independence could no longer be conceived only in economic terms. Alongside, there was the calculus of military parity. They were related to the instability sprawled by widespread poverty, squalor, hunger, disease, illiteracy. They were

connected to the degradation of the environment. They were enmeshed with inequity and injustice' (Dodswell 1995 p.2).

Recognising that no nation could resolve these issues on their own, those attending the Summit signed agreements on international co-operation in tackling development and environment concerns. These concerns included '...the perpetuation of disparities between and within nations, a worsening of poverty, hunger, ill health and illiteracy and a continuing deterioration of the eco-system on which we depend for our well-being'. Most significantly, Agenda 21, of the conference called for 'a global partnership for sustainable development' (UNCED 1992, Preamble).

Unfortunately, linking the concept of sustainability with development has served to strengthen, rather than question, the basic suppositions of economic progress. It has given strength to those whose preference is 'sustainable economic growth'. For this reason, the concept of sustainable development is popular with both western industrialists because it retains the principle of development and developing countries since it is 'seen to offer hope for a better share of the world's wealth' (Smyth 1995 p. 12).

As a consequence, the term 'sustainability', is preferred by many reputable bodies and is espoused in *Caring for the Earth* (International Union for the Conservation of Nature (IUCN) and the United Nations Environment Programme (UNEP)). *Caring for the Earth* represents an attempt to identify the limits to the compromises possible and still



maintain social and ecological sustainability. In order to avoid semantic arguments over the meaning of sustainable development, they coined the term *sustainable living*, and defined it as:

'... a kind of development that provides real improvements in the quality of human life and at the same time conserves the vitality and diversity of the Earth. The goal is development that meets these needs in a sustainable way... Living sustainability depends on a duty to seek harmony with other people and with nature. The guiding rules are that people must share with each other and care for the Earth. Humanity must take no more from nature than nature can replenish. This in turn means adopting lifestyles and development paths that respect and work within nature's limits. It can be done without rejecting the many benefits that modern technology has brought, provided that technology also works within those limits' (IUCN, UNEP and WWF 1991, p. 8).

It proposed that government, industry and families need to live by a new world ethic of sustainability. This ethic (Box 1) contains several values that together define a comprehensive set of criteria for sustainable development. In summary form, these values fall into two groups - those related to our responsibility to care for nature (or ecological sustainability) and those related to our responsibility to care for each other (social justice). Four values may be identified in each group.

BOX 1: A WORLD ETHIC FOR LIVING SUSTAINABLY**People and nature:
Ecological sustainability**

Interdependence: People are a part of nature and depend utterly on it. They should respect nature at all times, for nature is life. To respect nature means to approach nature with humility, care and compassion; to be frugal and efficient in resource use; to be guided by the best available knowledge, both traditional and scientific; and to help shape and support public policies that promote sustainability.

Biodiversity: Every life form warrants respect and preservation independently of its worth to people. People should preserve the complexity of ecosystems to ensure the survival of all species, and the safeguarding of their habitats.

Living lightly on the earth: All persons should take responsibility for their impact on nature. They should maintain ecological processes, the variety of life, renewable resources, and the ecosystems that support them. They should use natural resources and the environment carefully and sustainably, and restore degraded ecosystems.

Interspecies equity: People should treat all creatures decently, and protect them from cruelty and avoidable suffering.

**People and People:
Social justice**

Basic human needs: The needs of all individuals and societies should be met, within the constraints imposed by the biosphere; and all should have equal opportunity for improving their lot.

Inter-generational equity: Each generation should leave to the future a world that is at least as diverse and productive as the one it inherited. To this end, non-renewable resources should be used sparingly, renewable resources should be used sustainably, and waste should be minimised. The benefits of development should not be consumed now while leaving the costs to the future.

Human rights: All persons should have the fundamental freedoms of conscience and religion, expression, peaceful assembly, and association.

Participation: All persons and communities should be empowered to exercise responsibility for their own lives and for life on earth. Thus they must have full access to education, political enfranchisement and sustaining livelihoods; and they should be able to participate effectively in the decisions that most affect them.

(Adapted from IUCN, UNEP and WWF 1990, p.22; Fien 1997 p.4)

**Achieving Sustainability:
The Role of Education**

There is wide agreement that education has an important role to play in motivating and empowering people to participate in the changes towards more sustainable lifestyles. It was a quarter of a century ago, that education was described by Schumacher (1973 p.64) as the 'greatest resource' for achieving a just and ecological society. Since then, the major international reports have emphasised the critical role education has to play in the search for sustainable living.

The Brundtland Report, (WCED 1987) argued that teachers had '...a crucial role to play in helping to bring about the extensive social changes' (p.xiv) necessary for sustainable development. The 1980 World Conservation Strategy was more explicit about the role of education in bringing about such changes. It argued that:

'A new ethic, embracing plants and animals as well as people is required for human societies to live in harmony with the natural world on which they depend for survival and well-being. The long term task of environmental education is to foster or reinforce attitudes and behaviours compatible with this new ethic' (IUCN UNEP & WWF 1980 sect. 13).

Agenda 21, the internationally agreed report of the Earth Summit, committed countries to promoting environmental sustainability through education. It states that:

'Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues...It is critical for achieving environmental and ethical awareness, values and attitudes, skills and behaviour consistent with sustainable development and for effective public participation in decision-making' (UNCED 1992, chap 36 p.2).

Chapter 36 on 'Promoting education, public awareness and training' was one of the few aspects of Agenda 21 which did not provoke contention at the Earth Summit. Both economically developed and developing countries agreed that education was critical for promoting sustainable development and

increasing the capacity of the people to address environment and development issues (UNESCO-UNEP 1996).

As a result, many environmental education policies and programmes around the world, are taking on board the new vocabulary of sustainable development and acknowledge the need to mobilise all sectors of society, not just formal education in the task of achieving sustainability (Agyeman et al. 1996).

**Towards Environmental
Education for Sustainability**

Recently, there have been a few attempts at defining the characteristics of this latest approach to education (Sterling/EDET Group 1992; Fien 1993a/b; Tilbury 1995, 1997; Huckle and Sterling 1996). The British Environment and Development Education and Training Group's report, Good Earth-Keeping: Education, Training and Awareness for a Sustainable Future, defines the nature of education for sustainability as follows:

'We believe that education for sustainability is a process which is relevant to all people and that, like sustainable development itself, it is a process rather than a fixed goal. It may precede - and it will always accompany - the building of relationships between individuals, groups and their environment. All people, we believe, are capable of being educators and learners in pursuit of sustainability' (Sterling/EDET Group 1992 p.2).

In its report, the EDET Group affirmed the validity of the different approaches to environmental education in achieving sustainable development. However, Tilbury (1995) and Fien (1997) argue that environmental education for sustainability must differ significantly from the apolitical, naturalist and scientific work carried out under the environmental education banner of the 1970s and 1980s. Education with the objective of achieving sustainability varies from previous approaches to environmental education in that it focuses more sharply on developing closer links between environmental quality, ecology and socio-economics and the political threads that underlie these.

To this end, we now explore several emphases in education that result from this integrative view of education and sustainability. These relate to the special need (1) to consciously link studies of the natural and social worlds, (2) to emphasise environmental citizenship, (3) to develop ethics and values, and (4) to incorporate a futures perspective in our programmes. Each of these emphases of education for sustainability is accompanied by several questions for reflection on possible implications for education in botanic gardens.

Linking the Natural and Social Worlds

Until recently, environmental education has tended to focus mainly on the quality of the physical environment, while development education has been traditionally concerned with questions of appropriate economic and social development. The recognition that real improvements in the quality of life are dependent on the reconciliation between economic development, environmental conservation and social equity has changed the agenda for environmental education, reorienting it towards the challenge of sustainable development.

Now issues such as food security, poverty, sustainable tourism, urban quality, women, environment and development, green consumerism, ecological public health and waste management as well as those of climatic change, deforestation, land degradation and desertification, depletion of natural resources and loss of biodiversity are primary concerns for both environmental and development education. Matters of environmental quality and human development are now central to environmental education for sustainability.

These concerns differ substantially from those of litter, nature study and the planting of trees in the school grounds and other apolitical and aesthetic work, that has often been the focus of much environmental education in the past. Formal resolutions contained in Agenda 21 recognised the need for re-orientation calling for environmental education to abandon its preoccupation with natural systems

in order to incorporate the concept of sustainable development. Studies of the geophysical and biophysical world are necessary - but not sufficient - prerequisite for learning to live sustainably.

The concrete links between social justice and ecological sustainability, identified at the Earth Summit undermine the primacy of what some have termed the ecological foundations of environmental education and suggest a broadening and deepening of the concepts of environment and environmental education. Education about bio-diversity and other nature-based themes - needs to be immersed in concepts of human rights, equity and democracy that are the core issues of sustainability (Fien 1997).

Huckle (1996) contends that contemporary environmental education not only has the task of committing individuals to sustainability but also to help them reflect upon and act on the different interpretations of sustainable development. This approach to critical education is a process of critical enquiry, in which we seek to explore the complexity and implications of the sustainability as well as the economic, political, social, cultural, technological and environmental forces which foster or impede sustainable development (Sterling/EDET 1992). This entails, involving people in questions about the ownership of common property resources (Hardin 1968), issues regarding international and intergenerational equity (Redcliff 1987), regional and national ecological footprints (Rees 1990) and most importantly, debates about qualitative versus quantitative growth (Pezzey 1989).

1. *How familiar am I with relatively new concepts such as: sustainable development, bio-diversity, human rights, democracy, common property rights, intra- and inter-generational equity, ecological footprints, qualitative versus quantitative growth, etc.?*
2. *How confident do I feel about my knowledge of the very wide range of social sciences (e.g. economics, development studies, current affairs, history, etc) necessary in order to plan educational programmes which incorporate sustainable development concepts?*

3. *How can I convince my garden managers that these concepts are relevant to my work as a garden educator?*
4. *Where can I obtain information on all these concepts?*

Environmental Citizenship

Educating for sustainability requires developing not only critical understanding of concepts such as these, but also the thinking skills necessary analysing vested interests, challenging bias, decision-making and solutions and prospects for change. Ultimately, its objective is to help educate politically literate individuals.

Political literacy is the key to developing competence in participating effectively in decision-making for sustainable development at local, national, international level (Sterling/EDET 1992; Fien 1993a). Huckle (1985) maintains that environmental education for sustainability can develop political literacy through helping individuals acquire (a) critical reflective knowledge about the environment; (b) democratic skills and values (c) critical thinking skills, and (d) experiences in the processes of environmental politics. These objectives can be developed through considering questions such as: how over-consumption, waste and mis-use of resources can be reduced; how poverty that sometimes causes environmental exploitation can be eliminated; how economic activity may be altered to minimise environmental deterioration; how resources can be redirected to aid the poor or be conserved for future generations; which forms of social organisation best contribute to sustainable development? (after Beddis and Johnson 1988).

Involvement with real problems and issues is the most effective way of developing the action skills needed to investigate, evaluate and implement solutions to problems. Environmental education for sustainability needs to not only involve people in real environment and development issues but also challenge individuals on a personal level to change parts of their lives and engage in more sustainable lifestyles. The result is that individuals are encouraged to take responsibility



for the care and management of the environment, directly through participation in practical conservation projects or, indirectly, as informed and concerned individuals through the democratic process. Action that is designed to solve environmental and development problems falls into the six categories: negotiation, persuasion, consumerism, political action, legal action and eco-management.

1. Which of the six categories of environmental action skills are most relevant to educational work in botanic gardens: negotiation, persuasion, consumerism, political action, legal action and eco-management?
2. What opportunities can I provide for children and adults to practice these skills?
3. How can botanic garden educators link with other community organisations to promote environmental citizenship?

Values and Environmental Ethics

Decisions to participate in environmental change are not stimulated by the knowledge alone but are dependent on personal motivations and the sense of responsibility that can result from the development of a personal environmental ethic. Environmental education needs to promote an environmental ethic that has sustainable living at its core (IUCN, UNEP and WWF 1980, 1991; UNESCO 1992). This ethic (Box 1) constitutes an important dimension of the new educational approach to sustainability.

1. Which of the two categories of environmental ethics in Box 1 are most relevant to educational work in botanic gardens? Why?
2. Pretend you are in a debate on the topic in Question 1, and you have been allocated to the team that has to argue the opposite to the answer you gave to

Question 1. What would be your three main arguments?

3. What opportunities can I provide for children and adults to develop both sets of ethics?
4. How can botanic garden educators link with other community organisations to promote an environmental ethic?

Sustainable Futures

Futures thinking is another dimension which has received a low profile in environmental education approaches. Hicks and Holden (1995) argue that at the basis of the sustainability debate is a move away from almost exclusive concern with present problems to preferred futures. They contend that such a temporal shift gives equal attention to solutions and future goals. Environmental education for sustainability thus requires an examination of probable and of possible alternative environmental futures. Hicks and Holden (1995) consider this futures orientation to be a missing dimension in contemporary environmental education.

Futures thinking is crucially linked to the concepts of 'hope', 'empowerment', and 'action' (Milbrath 1989; Meadows 1992; Hicks and Holden 1995; Ali Khan 1996). Futures thinking is necessary for not only envisioning but also moving towards a sustainable society. It needs to form part of the new approach to environmental education.

1. Why do educators concerned with the future, call themselves 'futures educators' not 'future educators'? Is this difference significant?
2. How do themes addressed in botanic garden education programmes illustrate a futures perspective?
3. Identify one special event you could plan for your botanic garden that promotes the relationships between gardens, sustainability and the future. How easy would it be to plan this special event?

Conclusion

Many environmental educationalists have found direction and strength in Agenda 21. The challenge for those who work in botanic gardens is to contextualise the ideas and mission of environmental education for

sustainability and to find ways of working towards it in their own work settings. Common to all our work, however, must be a vision for a more socially and environmentally sustainable future. We will all hold different perspectives on the philosophy, principles and approach to environmental education for sustainability and have different levels of opportunity and freedom to develop exciting new programmes and redevelop our old ones. We look forward to reading case studies of how botanic garden educators interpret the nature of environmental education for sustainability in a variety of different cultural settings; how the ideals of environmental education for sustainability are translated into practice; and how the tensions and issues which are encountered are overcome.

Left:
A key ingredient of living sustainably - is maintaining biodiversity.

Below:
People are a part of nature and utterly dependent upon it.



▲ Resumé

Il n'y a pas pour le monde, aujourd'hui, d'objectif plus évident et ayant à long terme une signification aussi profonde que la nécessité de trouver des moyens de vivre sans dépasser la limite des ressources de la planète et de nos systèmes sociaux. La vie en accord avec la gestion durable est pertinente pour tout le monde et l'éducation a un important rôle à jouer dans la motivation et l'incitation des gens à participer au changement visant un type de vie en accord avec cette gestion durable. Les résolutions de l'agenda 21 soulignent le besoin de réorienter l'éducation vers l'environnement et d'éliminer les préoccupations posées par les systèmes naturels afin de réintroduire le concept de développement durable en fonction des ressources. Dans cette optique, l'éducation diffère des approches traditionnelles classiques de l'environnement en cela qu'elle développe des liens plus étroits et plus focalisés entre la qualité de l'environnement, l'écologie, les facteurs socio-économiques et les fondements politiques sous-tendus.

L'Education pour la gestion durable des ressources a besoin d'un lien conscient entre les mondes naturels et sociaux. Ce lien inclut un renforcement du droit de citer de l'environnement, du développement d'une éthique et un programme incluant une vision claire du futur. Cette vision est commune pour tous les jardins botaniques pour un futur durable plus social et avec une meilleure conscience environnementale. Le défi pour chaque jardin en particulier et de trouver le chemin pour travailler dans son propre contexte et d'appliquer pratiquement les idées et les missions de l'éducation pour une gestion durable des ressources.

● Resumen

Ningún otro tema en el mundo de hoy es tan significativo e influenciante como la necesidad de encontrar maneras de vivir con los limitados recursos del planeta y nuestros sistemas sociales. La vida sostenida es relevante para todos y la educación juega un papel importante motivando y

animando a la gente para que participe en los cambios hacia estilos de vida más sostenidos.

Resoluciones oficiales de la Agenda 21 identificaron la necesidad de reorientar la educación medioambiental y abandonar la preocupación por los sistemas naturales para incorporar el concepto de desarrollo sostenido. La educación cuyo objetivo es alcanzar el equilibrio, difiere de los enfoques tradicionales sobre la educación ambiental en que se centra principalmente en el desarrollo de nexos más cercanos entre la calidad del medioambiente, la ecología, lo socioeconómico y los aspectos políticos que subyacen.

La educación para el equilibrio ("sostenibilidad") necesita tener un vínculo consciente entre el mundo natural y el social. Esta unión incluiría

un énfasis en la ciudadanía medioambiental, en el desarrollo de las éticas y valores y también en un programa con perspectivas de futuro. Lo que es común para todos los Jardines botánicos es la visión de un futuro sostenido más social y medioambiental. El reto de los jardines individuales es encontrar formas de trabajar en sus propios lugares y aplicar de manera práctica las ideas y la misión de la educación para el mantenimiento.

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Our Forest, Our Culture, Our Life – Omaere

Notre Forêt, Notre Culture, Notre Vie – Le Parc Omaere

25

Nuestra Selva, Nuestra Cultura, Nuestra Vida - el Parque Omaere

Desde 1993 la Fundación OMAERE se encuentra implementando el proyecto denominado "PARQUE PEDAGOGICO ETNOBOTANICO OMAERE", gracias al apoyo de la Comisión Europea, cooperación francesa (DEV-IVA, FFEM), Fundación Nicolás Hulot, y a la UNESCO entre otras instituciones y a partir de 1997 está trabajando en coordinación con la Organización de Pueblos Indígenas de Pastaza (OPIP).

El PARQUE OMAERE fue concebido como el primer Jardín Etnobotánico de América Latina, Centro de Investigación y Capacitación especialmente creado para la Amazonía; y después de estos cinco años de arduo trabajo, la infraestructura del Parque se ha consolidado y cuenta con 15 construcciones, entre las cuales encontramos un centro de documentación, aulas para actividades de capacitación y seminarios, un centro de información, un área infantil, casas shuar, huaorani, zápara, descanso del "cazador" y del "shamán".

Enmarcado en este contexto el PARQUE OMAERE fomenta programas participativos de Educación Ambiental y de Conservación, que incluyen talleres de formación para estudiantes, docentes y comunidades; publicaciones y producciones de audiovisuales privilegiando la valorización del conocimiento botánico indígena y buscando alternativas económicas sustentables acorde con las necesidades de las bases mismas.

El PARQUE OMAERE, a partir de 1996 ha emprendido una labor educativa enfocada a convertirse en un centro que permita a la comunidad de la ciudad del Puyo, de la provincia de Pastaza, y de la región amazónica en general, enriquecer su proceso de

enseñanza-aprendizaje mediante el conocimiento directo, sistemático, didáctico y vivencial de diversos elementos del medio ambiente y su conservación.

El Programa Educativo que se desarrolla está basado esencialmente en las necesidades de cada comunidad y gracias a las estrechas relaciones que el PARQUE OMAERE mantiene con varias comunidades de la provincia de Pastaza, ha permitido a otras comunidades acercarse al Parque para solicitar cursos, seminarios y talleres de capacitación, así como también asesoramiento en áreas de reforestación y conservación de recursos botánicos.

Los cursos y talleres que se imparten consisten básicamente en el intercambio mutuo de visitas, a fin de hacer un *seguimiento permanente* del trabajo realizado. En el caso de las comunidades (grupos de niños o adultos) viene al Parque donde se les proporciona los conocimientos básicos y netamente prácticos en áreas específicas como: Manejo Agroforestal, Huertas Medicinales, Manejo de Viveros, Asesoramiento y Manejo de Recursos Naturales y Conservación; posteriormente se hace una práctica sobre el tema tratado, en sectores destinados para dicho efecto dentro del Parque. Lo fundamental de este trabajo es que al término del taller los participantes son quienes espontáneamente plantean la idea de impulsar pequeños programas de conservación (huertas medicinales, huertas tradicionales, viveros) y autosustento en sus comunidades, lo cual representa un enorme logro en la búsqueda de mecanismos que permitan una exitosa "educación para la sustentabilidad".



Left:
Visita de niños
de la Comunidad
de Kunkup
(Amazonia
ecuatoriana) al
Parque OMAERE

Como complemento a estas labores OMAERE se encuentra efectuando un proceso de diagnóstico en dos comunidades shuar y una quichuazápara, con la finalidad de impulsar la creación de áreas protegidas comunitarias de protección del bosque, bajo responsabilidad de la comunidad.

Además, el Parque OMAERE trabaja con jóvenes del colegio Vicente Ferrer de la ciudad de Puyo, quienes han formado el club CAOBA, para la protección del medio ambiente y que está vinculado con el club de la Fundación Nicolas Hulot pour la Nature et l'Homme de Francia. Estos jóvenes han colaborado en varias actividades de conservación y adecuación del área infantil del Parque.

Durante 1997, el Parque OMAERE organizó y participó en varios talleres y encuentros, que contaron la presencia de alrededor de 150 personas, entre profesores y supervisores de la Dirección Nacional de Educación Intercultural Bilingüe y dirigentes de las diferentes organizaciones indígenas locales y regionales; así como también estudiantes de la Universidad de las Nacionalidades Indígenas de la Amazonia ecuatoriana (UNIDAE). Estos eventos abordaron el tema de "Educación Ambiental para

supervisores y personal docente" y, paralelamente se realizaron Talleres Interculturales, a fin de optimizar el trabajo conjunto entre las diferentes nacionalidades y organizaciones indígenas de la provincia y la región.

El Parque OMAERE suscribió un convenio con el Centro Educativo Comunitario de Educación General Básica "AMAUTA ÑANPI" del Puyo; con el objetivo de aunar esfuerzos para elevar el interés en la comunidad educativa en la *relación directa hombre-naturaleza*, a más de aprovechar y compartir los recursos humanos y experiencias obtenidas para promover la educación ambiental en los sectores formales e informales de educación. Para dicho efecto, durante este año se han planteado actividades destinadas a la capacitación del equipo del Parque OMAERE, para posteriormente planificar y promover la realización de talleres, programar visitas al Parque OMAERE, diseñar, promocionar y distribuir material didáctico de Educación Ambiental en la comunidad educativa.

A lo largo de estos años, hemos aprendido a compartir con la gente y en especial con los niños que visitan nuestro Parque y a quienes también visitamos en sus comunidades y escuelas, ellos nos han hecho saber, lo fundamental que resulta el contar con un lugar para aprender, donde cada sendero, cada árbol y cada rincón mismo, forman parte de un libro sin páginas y constituyen una "vitrina viva" de fácil acceso que encierra conocimientos milenarios.

La experiencia adquirida por quienes formamos el equipo del PARQUE OMAERE es invaluable, y ha fortalecido enormemente nuestra mente y espíritu, cada recuerdo plasmado en nuestros corazones,

constituye una vivencia imborrable y las impresiones dejadas por los visitantes en nuestro libro de memorias, ratifican nuestro eterno compromiso de trabajo en áreas de la *conservación y educación...de nuestra selva, de nuestra cultura*.

Notas tomadas de nuestro Libro de Memorias:

- La experiencia fue gratificante, la diversidad de especies, las diferentes culturas y el buen trato recibido por los guías harán que regresemos muy pronto. *Estudiantes de la Facultad de Diseño de la Universidad Católica, Ambato*
- Creo que Dios tiene un propósito es por eso que nosotros hemos tenido la oportunidad de llegar a esta pequeña "*Sucursal del Cielo*", para nuestros niños OMAERE constituye una guía, para que en el futuro sean ellos portavoces de la gran misión de salvar nuestro mundo. Sigamos adelante nuestros niños vivirán siempre agradecidos. *Escuela Francisco de Orellana*
- Este mundo que ustedes están preservando es maravilloso, quizás algún día este conocimiento y sabiduría hagan toda la diferencia en la supervivencia del planeta y la raza humana. *Elisa Nicholson, Australia*

■ Summary

Omaere Park, the first ethnobotanical garden in Latin America, is a training and research centre created for the Amazon region. Following five years hard work the infrastructure of the park now exists and includes a resource centre, classrooms for training activities, a children's area, and a number of houses representing local indigenous communities.

Within this context, Omaere Park develops participative environmental education and conservation programmes for students, volunteers and the local community. Advice is given in the areas of reforestation and conservation and publications and audiovisuals have been produced to

raise awareness of indigenous botanical knowledge and encourage a search for sustainable economic alternatives. Omaere's work in education is constantly evolving and has resulted in the empowerment of local people who take greater responsibility for their environment by for example, developing community medicinal gardens and nurseries and creating protected areas and forests.

▲ Resumé

Le parc Omaere, le premier jardin ethnobotanique en Amérique latine, est un centre d'études et de recherches créé pour la région amazonienne. Après cinq ans d'un dur travail l'infrastructure du parc existe désormais et comprend un centre d'information, des classes pour des activités pédagogiques, un espace pour enfants et un nombre d'habitations représentant les communautés indigènes locales.

Dans ce contexte le parc Omaere entreprend l'éducation environnementale et des programmes de conservation pour des étudiants, des volontaires et les populations locales. Des conseils sont donnés dans les zones de reforestation et de protection, des publications et du matériel audiovisuel sont produits pour faire prendre conscience de la connaissance botanique indigène et encourager une recherche pour une économie alternative en phase avec une gestion durable des ressources. Le travail d'Omaere en éducation est en constante évolution et à résultat d'un engagement des populations locales qui se sentent de plus en plus responsables de leur environnement par exemple, dans le développement de jardins de plantes médicinales et de pépinières ainsi que la création de zones protégées y compris en forêt.

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Right:
 'Para nuestros niños OMAERE constituye una guía, para que en el futuro sean ellos portavoces de la gran misión de salvar nuestro mundo'.



La biodiversité des milieux humides : un message à transmettre

Biodiversidad de los pantanos: un mensaje para llevarse a casa

27

Wetland Biodiversity: A Message to Take Home

Wetlands are one of the most diverse and productive ecosystems on the earth. In southern Ontario alone 80-90% of the pre-settlement wetland base has been lost due to drainage, filling or habitat alteration. This enormous loss of habitat is of major concern since 24% of the world's wetlands are found in Canada. Wetlands provide many important environmental functions. In addition to providing habitat for a diversity of plant and animal species, wetlands also recharge ground water supply, acting as a reservoir for fresh water. Wetlands also act as a buffer to moderate flooding, reduce erosion and purify water.

We now recognize that the loss of wetlands in our human modified landscape has a serious impact on the land and its ecosystem health. How can we best turn this situation around? Firstly, it is important that people understand and appreciate wetlands for what they are, intriguing biological systems that are home to a diversity of life, as well as important for their ecological functioning. Thus our conservation goal is to engender a new wetland appreciation in our visitors by giving them a positive experience. It is also important that we offer options that individuals can take home and use to improve the condition of wetlands in their community and in the regional landscape.

Exhibits at the Toronto Zoo

The Toronto Zoo has developed two outdoor exhibits that feature created native wetland systems; the *Wetland Habitats*, a series of ponds and adjacent meadows, and the *Waterway Wetlands*, a large marsh fed by a meandering stream of typical pool and

riffle morphology. Both systems take advantage of surface run-off from the surrounding land and are also connected to the zoo's waterway. Both systems were planted with different combinations of species native to regional wetlands and typical of the hydrology and form of the individual pond or marsh. The animals inhabiting the wetlands have colonized the areas on their own, from various aquatic invertebrates, terrestrial and aquatic insects, to an array of frogs, toads and birds. When the sites were under planning in 1993, all curators were asked what features they would like to see in the new habitats. This resulted in a plan with high habitat diversity, including ponds of different depths, substrates and plant communities, adjacent meadows, a developing forest, and even a snake hibernaculum.

The *Wetland Habitats* exhibit, excavated and first planted in 1994, is maturing with a diversity of wetland plants and aquatic invertebrates, as well as numerous frogs, toads and their tadpoles. These all make for interesting observations at a Close Encounters table staffed by Zoo volunteers, where magnifiers bring the diverse pond life into view for inquisitive Zoo visitors. Signs and leaflets aid in the interpretation of the various plants and animals in the ponds as well as the important ecological services that wetlands provide, from water processing in individual ponds, to water and nutrient cycling at the watershed level. Being surrounded by created habitats provides an interactive experience where plants, animals, water, and soil can be seen as a complex ecological web, allowing visitors to directly experience the role individual

organisms play in a natural system. This provides many people, particularly urban dwellers, with their first experience in a natural area. Information is provided on constructed wetlands, with the opportunity to use the zoo's wetlands as a model for a community, from local parks, schoolyards to private backyards, extending the experience and allowing for individual action.

The Waterway Wetlands were excavated in the summer of 1997 and initial plantings are in place. Additional plantings and interpretive signs on ecosystem health are scheduled for 1998-99. The issues of ecosystem health, focusing on what services the ecosystem provides and individual action to increase wetland health and biodiversity, will be addressed.

Adopt-A-Pond Wetland Conservation Programme

The exhibits complement an educational programme that addresses local wetland conservation. The *Adopt-A-Pond Programme* was developed at the Toronto Zoo in 1991 and now over 1200 schools are involved. Staff responsible for Adopt-A-Pond collaborate with, and provide educational material and resources for, national and international partners in the effort to raise concern for the protection and restoration of wetlands globally, and to provide action opportunities in our own schoolyards and backyards.

The wetland exhibits provide school groups with an opportunity to get their feet and hands wet as they discover the diversity of life below the surface of the water. Zoo volunteers are trained as *Pond Guardians* providing wetland

talks and outreach programming for Ontario school groups. A wetland study module will soon be available, which will further complement the wetland exhibits. The module will provide a guide and video for educators to utilize wetlands as an extension of the classroom. The zoo wetlands serve as a field centre for wetland studies, especially for schools that cannot create their own wetland.

Right: Signs provide information on plants and animals and aim to increase people's understanding of wetland ecology.

Working with schools is an effective tool for wetland conservation. There is also a need for education to empower communities to actively participate in local restoration and creation projects. The zoo's exhibits and school programming, and the *Adopt-A-Pond* Programme, are resources for community action. *The Frogwatch-Ontario* Programme is a community based amphibian monitoring programme designed to increase awareness of the importance of local wetlands. Community members of all ages have fun while collecting frog call data that will provide long term trends in amphibian distribution. *Frogwatch-Ontario* targets schools but also appeals to urban, rural and isolated communities.

The involvement and enthusiasm of individuals within communities make the restoration of urban wetland systems possible. Increasing awareness about the ecosystem and environmental issues creates a connection with the habitat and a greater sense of concern for ecosystem health. The development of environmental appreciation is an important outcome for school group experiences. The combination of enthusiasm and energy within community members will overcome

Below: Zoo campers are actively involved in establishing wetland habitats.



any perceived hurdles in conservation projects. Together communities can make a difference in the conservation of wetland habitat.

The *Adopt-A-Pond* webpage (accessible through www.torontozoo.com) provides program information and material, such as the *Urban Outback-Wetlands for Wildlife Guide*, the quarterly newsletter *Amphibian Voice*, the *Adopt-A-Pond's Wetland Curriculum Resource*, and links to the amphibian monitoring programme, Frogwatch-Ontario, and other conservation groups.

▲ Resumé

La présentation de l'écosystème reconstitué permet au public visiteur de se familiariser avec des systèmes interactifs (c'est parfois le premier contact avec un système naturel), ils sont interpellés par la diversité des espèces peuplant le milieu et gagnent en compréhension et en appréciation de tels systèmes et des potentialités fournies par le paysage régional au sens large. Le programme zoologique "Adopte une Marre" avec plus de 1200 écoles vient appuyer ces expositions et avec les programmes scolaires aide les populations à s'investir dans la création et la conservation de zones humides, spécialement dans les zones urbaines. Ces expositions expérimentales servent aussi de modèle pour nos visiteurs afin qu'ils perçoivent les opportunités qu'ils ont d'effectuer des changements dans leur propre communauté ou dans leur vie personnelle : elles sont particulièrement adaptées aux jardins publics et aux zoos.

● Resumen

Los elementos de los ecosistemas autóctonos reconstruidos permiten a los visitantes experimentar con sistemas interactivos (a veces se les ofrece su primera experiencia de un sistema natural) y sentir curiosidad por la variedad de habitantes. Así mismo se logra un entendimiento y una apreciación de sistemas como éstos y de los servicios que ofrecen en un paisaje regional más amplio. El programa 'Adopte un estanque'



llevado a cabo por el Zoo de Toronto cuenta con la participación de más de 1.200 colegios y complementa los elementos expuestos en el lugar y la programación del colegio. Del mismo modo ayudan a implicar a las comunidades en la creación y conservación de los pantanos, especialmente en zonas urbanas. Los objetos con los que se experimenta sirven también para que nuestros visitantes vean opciones y oportunidades para ponerse en marcha de manera positiva en su comunidad y en su vida personal: están perfectamente adecuados para jardines públicos y zoológicos.

Para más información sobre los programas del Zoo de Toronto, mire en nuestras páginas web: www.Torontozoo.com

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Empowering the Community Wealth for all



Introduction

The role of botanic gardens in the popularisation of science and environmental education is well recognised. Botanic gardens can play a major role in educating people on the sustainable utilisation of the local biodiversity particularly in the areas of health care and income generation. Success stories of programmes and experiments that can be emulated in this line are rare especially for the botanic gardens in developing countries. During the past four years, the Tropical Botanic Gardens and Research Institute (TBGRI) has developed two action programmes; *'Herbs for All and Health for All'* and *'Plants for All and Wealth for All'* as part of its outreach programme. These programmes were designed to develop the productive potential of the under-utilised floristic wealth of the nation, and actively involve community members including the educated, unemployed youth and home makers.

Background

A healthy population is the real wealth of a nation and it is the collective responsibility of individuals, families and governments to ensure the community's health security. Food security for people is the basic requirement to their health security. People should get an adequate quantity of nutritious food, clean and safe drinking water and pure air to

breathe. The TBGRI educational programme addresses this central theme and has launched various action oriented programmes to aim towards conservation and the sustainable utilisation of biodiversity.

Prior to launching the programmes, background information on the socio-economic and resource profile of the villages was obtained. This provided information to enable effective evaluation of the program to take place. The data collected included information on the:

- bio resources of the region and their utilisation pattern
- social organisation of the villages
- socio-economic and techno-economic capabilities of the villages
- health profile of the villagers and the status of health management in the villages.

Following this assessment four traditional villages from the Thiruvananthapuram District, Njaraneeli, Bharathannoor, Pampuchathamannu and Panangode, were selected to be involved. The villages are situated within a 20km radius of TBGRI and the majority (80%) of people belong to farming communities owning small pieces of land (0.1 - 0.5ha) and cultivating rubber, paddy, pepper and tapioca.

The villages mostly consist of Christian, Muslim and Hindu groups, the majority of whom are literate.

Developing the Approach – Stage 1

A team of TBGRI scientists comprising botanists, Ayurvedic experts and sociologists visited the villages and

met several influential people i.e. the President and members of the Panchayat (village council), school teachers, office-bearers of art and sports clubs and other non government representatives. During the visit, the TBGRI proposed action plan was discussed.

Encouraged by their positive response, TBGRI initially organised an exhibition and a series of seminars in the villages and then invited the 25-30 representatives from each village to TBGRI for a two day awareness programme.

On the first day of the programme, scientists gave lectures on:

- agro-biodiversity
- wild bio-resources
- conservation and sustainable productive use of bio-resources and value addition
- ecologically sound and economically sustainable utilisation strategies,
- the importance of traditional diets
- the qualitative superiority of local fruit and vegetables
- the issues involved with the disappearance of home gardens
- the harmful effects and problems associated with monoculture practices throughout the country.

The second day involved a tour of the garden. The aim of this being to increase the villagers' understanding of locally available medicinal plants from the common village lands, sacred groves and nearby forests. The villagers were encouraged to collect wild material from the common village lands and the garden according to their needs and medicinal and indigenous plant uses were highlighted during the tour.

Left:
Villagers get plenty of opportunity for 'hands-on' experience as they prepare herbal remedies at the TBGRI Herbs for All and Health for All training course.

The tour included a visit to the demonstration garden where a model for community management of bio-resources and a home garden have been developed.

“The model home garden is 200m² with a three-room thatched hut centrally located. A well has been placed in one corner, a medicinal and ornamental plant garden in the front courtyard, and the vegetable garden at the rear. The medicinal plant garden contains 17 selected plants including *Hibiscus*, *Centalla asiatica*, *Aloe*, *Ocimum*, *Coleus*, *Asparagus* and *Adhatoda*. The vegetable garden plants include muringa, papaya, solanum, amaranthus, colocasia, yam, capsicum, pepper, ginger, mango, and jackfruit.”

After the two day awareness programme the village representatives were requested to select a core group of 10-15 persons from each village. It was highlighted that this was a self help programme aimed at empowering people to take the best care of their food, nutrition, hygiene and health. A key component of the programme was to encourage people to explore more productive ways of utilising their local resources by applying science and technology with a view to gaining economic prosperity by using the local biodiversity.

Training the Trainers - Stage 2

The villagers returned to their villages, organised meetings and selected the core group for an intensive one week residential training course at TBGRI. The core group consisted of ten people, mainly women (32 women and 8 men), from four villages. The training was conducted in two phases, the first phase emphasised primary health care, while the second focused on conservation and sustainable utilisation of the plant biodiversity.

The topics addressed during lectures were:

- general awareness of the functioning of the human body
- public health, diet, nutrition and hygiene
- local flora and identification of medicinal plants, wild vegetables and fruits

- preventative, promotive and curative properties of medicinal plants
- a demonstration and practical training on the preparation of compounds for treating common ailments
- the cultivation and sustainable utilisation of plants having medicinal and nutritional values.

“Demonstration and practical training in the preparation of compound drugs was provided. This involved members of the core group collecting plants from TBGRI and preparing and processing the home remedies. The drugs were designed for use as home remedies for cuts, wounds, burns, sprains, dislocation, diarrhoea, flatulence, intestinal colic, indigestion and anorexia.”

The core group was then provided with:

- a list of plants that could be conserved and cultivated in the village and homestead
- information on how to cultivate medicinal and wild edible fruit bearing plants for the purpose of the household and small scale cultivation to generate income
- training in the cultivation and grafting of fruit trees
- information on growing multiple species that represent the diversity in the canopy level of the nearby forest.

At the end of the training, group members were given seedlings of medicinal plants, and lesser known edible fruit and vegetables for cultivation in their own gardens.

Empowering the Villages – Stage 3

The real success of this type of programme depends on the effective dissemination of information throughout the community and the total participation of the people involved.

The third stage of the programme was implemented after the core group members returned to their villages. This last stage involved the members adopting twenty families in their locality and training them. TBGRI scientists were available to provide technical

guidance and supply plant materials for the home gardens.

The training programme emphasised the need for self reliance in the primary health care of the family members. The participatory families collectively mobilised funds and herbs for preparation of the home remedies. Each group prepared the home remedies under the guidance of the core group member and TBGRI scientists.

The Story of Success

Encouraged by the success of the trial programme (1994-96) TBGRI received several requests from adjoining villages for an extension of this programme in their areas. After preliminary analysis of the socio-economic data of the villages, four more traditional villages became involved in the programme during 1996-98. When the programme was initiated in these newly adopted villages 800 families benefited.

During the course of this training, TBGRI produced several brochures, fliers and books in the local language for the benefit of the trainers and trainees. The topics addressed included primary health care, commonly cultivated medicinal and aromatic plants, and wild edible fruit and vegetables. The programme was highly regarded by several international bodies, and the World Bank appointed a team of people to document the entire programme to be used in other developing countries.

▲ Resumé

C'est la responsabilité collective des individus, des familles et des gouvernements d'assurer la sécurité sanitaire des membres de la communauté. Les jardins botaniques peuvent jouer un rôle important dans l'éducation pour l'utilisation durable de la biodiversité locale et du maintien de la santé publique pour les générations à venir. Parmi ces objectifs, de nouvelles activités innovantes ont été développées par les jardins botaniques tropicaux et l'institut de recherche de Kerala en Inde. Ces activités visent par l'intermédiaire de membres influents de la communauté à prendre part à des responsabilités concernant les vivres,

la santé, la nutrition et l'hygiène. Des villages ont été sélectionnés pour participer au programme en accord avec leurs statuts sociaux et économiques et l'identité des populations.

Au départ, des représentants de chaque village ont assisté à une session de 2 jours pour une prise de conscience sur la conservation et les pratiques de gestion durable. Ces représentants ont alors sélectionné des gens de leur communauté (en particulier des chômeurs et des personnes au foyer) pour prendre part durant une semaine au TBGRI sur la santé publique, la conservation, et l'utilisation durable de la diversité des plantes. La troisième étape de ce programme était d'inciter les participants à "parrainer" 20 familles dans leur localité et à les enrôler dans les programmes d'actions incluant la préparation de recettes pour la maison et la culture de plantes sauvages.

● Resumen

Es responsabilidad colectiva de cada uno, de las familias y del gobierno, garantizar la seguridad de la salud de los miembros de la comunidad. Los jardines botánicos pueden desempeñar un papel importante educando a personas para la utilización sostenida de la biodiversidad local para el cuidado de la salud y las generaciones venideras.

Nuevas actividades innovadoras han sido desarrolladas por los Jardines Botánicos Tropicales y el Instituto de Investigación de Kerala en la India como una parte de su programa social. Estas actividades se centran en concienciar a los miembros de la comunidad de que son responsables de la comida, la salud, la nutrición y la higiene. Los pueblos que forman parte del programa fueron seleccionados de acuerdo con su estatus socioeconómico y el estado de salud de sus ciudadanos.

En un principio, representantes de cada pueblo asistían a un programa sobre conservación y prácticas para la "sostenibilidad" que duraba dos días. Éstos representantes se dirigían a la gente de su comunidad (en particular a las amas de casa) para que participaran en una semana en el TBGRI y se centraran en la salud para todos, la conservación y la utilización sostenida de la biodiversidad de las plantas. La tercera fase del programa hace que los participantes adopten veinte familias de su localidad y les formen en el programa, incluyendo la preparación de remedios caseros y el cultivo de plantas salvajes.

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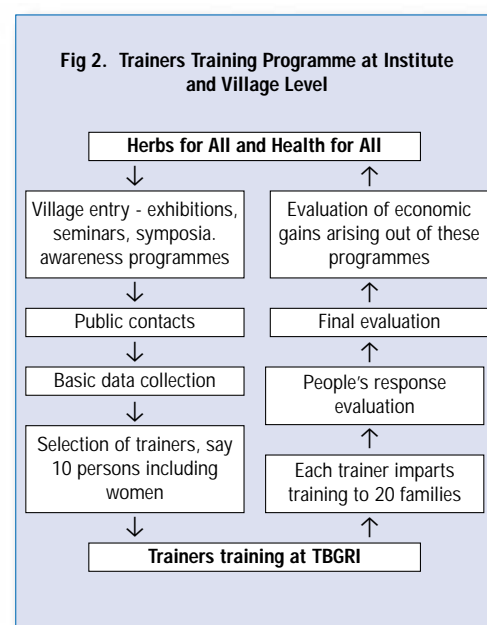


Fig 1. Out Reach Programme of TBGRI (Conservation and Sustainable Utilization of Bioresources)

Environmental Education and Awareness	Cultivation and Conservation of Plant Resources	Science and Technology Application for Development of Diversified Value Added Products	Organizational Development
<ol style="list-style-type: none"> 1. Module and literature preparation on conservation (ex situ and in situ) and sustainable utilization (development of herbal drugs, ethnic food articles for preventive and promotive health care system, or horticultural and pomicultural resources). 2. Mobile resource plant exhibition unit 3. Inventorying and preparation of village biodiversity register 4. Popularization of biodiversity conservation and herbal health care system (preventive and promotive health care and ethnic food) using audio visual aids and performing arts 	<p>Training on</p> <ol style="list-style-type: none"> 1. Conservation and cultivation of medicinal, aromatic and other economically important plants 2. Post-harvest technology 3. Biotechnology based plant production system 	<ol style="list-style-type: none"> 1. Development of location specific eco-friendly production of value added products based on local resources 2. Transfer of the above technology to people and training programme, establishment of production units 	<p>Human Resource Development Programme</p> <ol style="list-style-type: none"> 1. Leadership development training 2. Entrepreneurial development training 3. Training on <ol style="list-style-type: none"> a. cultivation and collection of economically important plants b. preparation of value added products 4. Organizing co-operative societies for marketing of value added products 5. Networking of total programme

Reflection, Participation and Change

Local Agenda 21 in Action

Local Agenda 21 focuses on the ability of local communities to:

'Foster a sense of personal environmental responsibility and greater motivation and commitment towards sustainable development' (Earth Summit p.224).

In order to do this well we need to construct an environment for learning that engenders not only the science of sustainability but the ethics, aesthetics and culture of sustainable development. We need to view both the science and culture of nature. In doing this within botanic gardens, we have to ask many questions of both our contemporary and historical working practices:

- Do we adopt a social model of education, offering a common platform for the shared experiences of what is both celebratory and problematic in science?
- Do we encourage: change, empowerment, equality and participation?
- With what voice(s) do our gardens speak? From which cultural

perspective do we come from and who do we perceive as our audiences?

- Are we using the lessons of the past to create the future?
- Do we provide opportunities for sharing human experience in an environment that values differences equally?
- Do gardens acknowledge that they are stewards of a living archive of cultural information?
- Do we create a set of issues which acknowledges a variety of interpretations and structures?

Local Agenda 21 encourages people to be involved in the sustainable use of the environment through their daily decision making. These decisions, whether about transport, recycling or biodegradability, all have an impact on other living organisms. Partnerships in Local Agenda 21 help to build a basis for equipping people with the:

'...knowledge and motivation required to amend the environmental mistakes of the past and construct a more sustainable future' (London Borough of Kensington and Chelsea 1996 p. 24).

The concept of biodiversity is part of that constructed knowledge. As Anna Lewington in a lecture at Oxford Botanic Garden commented *'...plants are as strategic as oil.'* It is not enough merely to concern ourselves with the biology of plants, we have obligations under Agenda 21 to develop a broader context where:

'... environmental education and development education...deal with the dynamics of both the physical, biological and socio-economic environment' (Earth Summit 1992 p.221).

In considering our role in Local Agenda 21 Chelsea Physic Garden has chosen to work in several ways:

- encouraging personal change by providing bike storage facilities for both workers and visitors
- buying 'fair trade' coffee
- encouraging waste recycling for workers and schools
- auditing and converting our cleaning materials, soap and toilet rolls to more eco-friendly ones
- using second hand computers in some sections of the garden
- using material from the living collections to make fencing e.g. bamboo cuttings
- printing conservation and education messages on the back of our seed packets.

On a recent public open day we invited three actors from *Emergency Exit Arts* to perform two one hour interactive walkabouts with three of their characters from their show *What a load of rubbish*. Initially Local Agenda 21 issues were discussed with the artists and the performance work was partly scripted and part improvisation. The three main characters included Mrs Gleam, a compulsive cleaner; Mrs Green, a committed environmentalist; and Miss Daydream, a total consumer. The characters operated in three different ways:

1. as visual images to engage the curiosity of visitors
2. as performers of debates with each other
3. as catalysts for conversation based around environmental issues with the visitors.

The audience was engaged from the beginning and the response varied



Right: Focusing on conservation based issues, Miss Daydream from *Emergency Exit Arts* meets a visitor to Chelsea Physic Garden.

from amazement and amusement to total curiosity.

We are working in close partnership with the local borough under a Local Agenda 21 umbrella of organisations, both voluntary sector and local government on several projects:

- being involved in annual awareness raising environment days
- producing a leaflet showing a map of several environmental education venues in the borough. The leaflet also contains a leaf of commitment for people to make personal pledges to change.
- providing a site for nitrogen dioxide measuring tubes to read road pollution (the garden is sandwiched between two busy roads).
- conducting an environmental audit of the garden by council staff
- providing a site to publicise the borough's plans for changing people's transport practices e.g. 'Don't choke London'; 'Walk to School Week' and 'Bike to Work Day'.
- providing the main contact point for schools based in the south of the borough wishing to develop environmental policies
- featuring the garden in the borough's walking guide.

Through The Royal Society's Millenium Awards and The Body Shop Foundation, the garden has received funding to develop a cultural botany link project with the Al Hasaniya Moroccan women's project in North Kensington. This project will record and present older Moroccan women's botanical knowledge in order to raise their self-esteem and strengthen bonds with young women in the community.

We feel that traditional knowledge amongst urban cultural communities needs to be recorded and presented in order to rebuild personal self-esteem and communal social fabrics severely compromised by radical geographical and cultural changes in people's lives. The preservation of this knowledge we hope will encourage the reinforcement of previous connections with plants and the wider landscape.

Mark Francis and Randolph Hestor (Jnr) stress the idea that large public gardens 'Speak as much of capitol and

control as of plants and nature' (1995 p.5). They go on to comment that gardens '...characterise the ideas and values of our time'. If this is the case, then botanic gardens can be considered important sites for developing patterns for sustainable living through education programmes.

At present cities occupy just 2% of the world's land surface, yet research suggests they devour some 75% of its resources. Chapter 7 of Agenda 21 states that: '*Consumption patterns of cities are severely stressing the global ecosystem*' (p.76).

Thus sustainable living is an important issue for city local government. Achieving sustainability needs many partners. Botanic gardens can be strong participants in this process and, as the majority are situated in urban areas, can provide accessible green environments for people to contribute to, and participate in.

As we head towards the year 2000 we need to consider our relationships with each other; between countries, continents, organisms and with land, sea and air. Botanic gardens have reached a stage in their history where we need to do more than reflect and ask questions. We need to make choices:

Do we stay within the garden wall and practise a culture of education that is uncritical and complacent in its social vision?
or
Do we go beyond the garden wall and engage in debate and change through participatory and reflective processes?

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▲ Résumé

Cet article fait le point sur le travail local concernant l'agenda 21 du Chelsea Physic Garden, UK. Il attire en particulier l'attention sur :

- les partenariats entre le jardin et le gouvernement local
- comment le concept d'utilisation raisonnée est mis en avant (contrôle des parasites véhiculés par les jardiniers et les visiteurs).
- conduite d'un audit sur le nettoyage et les matériels utilitaires
- récupération de l'eau de pluie
- le recyclage dans le jardin
- l'interprétation vivante

Cet article signale les projets visant à rendre le jardin accessible aux différentes populations et expose comment le message de gestion durable des ressources s'intègre dans le schéma des programmes éducatifs.

● Resumen

Este artículo revisa la Agenda 21 de Chelsea Physic Garden, Reino Unido. En particular se centra en:

- Asociaciones entre los jardines y el gobierno local.
- Fomentar el concepto de "usar menos" (ej. : animar a visitantes y trabajadores del centro a utilizar transportes no contaminantes).
- Llevar a cabo una inspección de productos domésticos y de limpieza.
- Utilizar recursos para aprovechar la lluvia.
- Reciclaje en los jardines.
- Explicaciones en el lugar.

El artículo se basa en proyectos disecados para hacer el jardín accesible a comunidades distintas y demostrar como el mensaje de equilibrio (sostenibilidad: palabra que no existe en la lengua española) se fija a través de todos los aspectos del programa de educación.

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People, Plants and Habitats

- a Lifelong Connection

Among the important questions botanical garden educators and conservationists grapple with are 'How can we sensitize and motivate children to care about endangered plants and habitats?' and 'How can we develop a conservation ethic in young children?' Endangered plants often finish a distant second behind students' concern for animals, yet few students will ever hold an endangered animal as they can an endangered plant.

The importance of protecting habitats and the concept of plants as foundations of healthy habitats are not always well understood by children. Georgia students are gaining personal experience with endangered plants through their work with the Georgia Endangered Plant Stewardship Network (GEPNS). This program is making important, potentially life-long, connections between people, plants, and their habitats.

Below:
Ron Determann
demonstrates to
teachers the use
of fire for habitat
management.

Zack Williams, a 7 year old student at Colham Ferry Elementary School, Oconee County, Georgia, is one of many children who has actually held and planted endangered species. He states, 'Wow, this plant is endangered

just like the whales and sea turtles. It might become extinct if we don't help.' Zack and hundreds of other children in Georgia are caring for endangered plants right on their school site through the GEPNS project. As the children plant, hold and care for these endangered plants, they begin to care about the larger environment and the seeds of environmental stewardship are nurtured.

The Georgia Endangered Plant Stewardship Network

The collaboration between the Atlanta Botanical Garden, Callaway Gardens, and The State Botanical Garden of Georgia has made the statewide GEPNS project possible. Working under the umbrella of the Georgia Plant Conservation Alliance a student endangered plant network was initiated in 1996.

To participate in this network, teachers attend a 20 hour training workshop to learn about Georgia's endangered species and habitats, propagation, and related science inquiry activities. Four GEPNS workshops have been held to date with approximately 90 teachers trained. Anne Shenk, Education Coordinator, and Jennifer Ceska, Conservation Coordinator, both with The State Botanical Garden of Georgia, developed the *Green Plant Blues* workshop and teacher notebook.

Students between 7 - 15 years embark on this project and become stewards for the environment by propagating rare plants from seed and by establishing these plants on their school sites. Some schools may be involved in propagating plants that will be returned to the wild during local restoration projects. Students collect

data including germination rate, flowering period, pollinator visits, and seed counts and report their findings to GEPNS Headquarters.

Initially classes undertake a plant species count of their school site. Through this process they collect baseline data about the number and diversity of plant species on site. Then, through the GEPNS project, students work to increase the number of plants on their school grounds by adding common and endangered species native to Georgia. At the beginning of the school year, GEPNS teachers are sent a list of available wildflower and endangered plant seeds and then during the school year, students grow these plants under lights in their classroom to add to designated plots in their school sites. As the number of species increase, species diversity and the importance of biodiversity start to become meaningful concepts.

Prior to receiving seeds, teachers and their students must apply for a permit from the Georgia Natural Heritage Program to grow endangered plant species on their site. The permitting process provides a meaningful lesson to students on legal issues related to endangered plants and on the importance of taking special care of the rare plants they are being permitted to grow.

Endangered Plants on the School Site

In the autumn, seeds are collected from plants grown on school sites. Some seeds are saved for propagation at the school; extra seeds are sent back to GEPNS Headquarters, packaged and shared with other





Left:
Children at
Jackson County
Elementary
School do the
'big dance' to
pack the sand
and peat moss
down and
prepare their
bog garden.

schools. Seeds are also collected from plants grown at participating botanical gardens. With permission from the Georgia Natural Heritage Program, additional seeds are sometimes collected by GEPSN educators and scientists in the wild.

Endangered plant seeds provided to schools include protected plants such as the Atlantic White-cedar (*Chamaecyparis thyoides*), a tree threatened by over-harvesting for telephone poles and wooden barrels, and herbaceous species such as Mohr's Barbara Buttons (*Marshallia mohrii*) threatened by loss of wet meadow habitats. Teachers are trained to prepare raised beds and amend the soil in preparation for planting. Students are involved in designing the outdoor classroom, calculating the costs and amount of supplies needed, developing a plan for implementing the design, planting the collection, and caring for the plants. Students have overcome unattractive obstacles such as air-conditioning units and forbidding

fences by planting vines to soften the landscape and attract pollinators.

A Pitcher Plant Habitat at Jackson County Elementary

Building pitcher plant bogs has been particularly appealing to participating classes because of their carnivorous habit. Children are surprised to learn how the pitcher plants "eat" bugs (and occasionally small frogs). Most people think of plants as passive organisms photosynthesizing quietly in the garden. Pitcher plants (*Sarracenia sp.*) found in eastern North America are carnivorous plants that capture prey with modified leaves through passive means (as opposed to active capture like the grasping "hands" of the Venus flytrap). Nectar glands line the opening of the pitcher, luring insects within the lip. Once inside, stiff, downward pointing hairs force the insect deeper and deeper within. The more the insect struggles, the further it descends. The inside surface is glaucous (smooth and slippery). At the

bottom of the pitcher, a pool of digestive enzymes waits to digest the prey!

Carol McDonald, a teacher at Jackson County Elementary School in Danielsville, Georgia, found that the students could not understand how the insects could be trapped within the open tube. They repeatedly asked 'Why don't they just fly out?' After dissecting a pitcherplant leaf from their bog garden and discovering the stiff hairs and smooth interior, they soon understood.

McDonald finds the GEPSN project a valuable experience for her students 'The children are taught that plants are unique and special, just like people, and they need to be cared for.' She believes the students gain a fundamental understanding and compassion for the environment because, '...they are a part of the solution, protecting the environment; it is easy to tell them about conservation, but when they actually see they make a

difference, they learn these concepts better and this has more influence on what they do in their lives.'

High School Project Enhances Team Building and Leadership Skills

At Oconee County High School in Watkinsville, Georgia, an endangered plant bog was planned and developed using a team of students as leaders. The students divided themselves into committees. The first committee was in charge of the greenhouse. In the fall of 1997 this team sowed seeds of bog species and monitored their growth. During the winter of 1997/98, the design team planned the bog, drew the plans, and purchased materials. Then the installation team along with members from other committees constructed and installed the bog during the spring of 1998, while two more committees took responsibility for community education.

'I feel using the student leader approach gave the team ownership in the project' says Paul Dallas, science teacher and project facilitator. 'Being owners of the bog, the students take pride in their accomplishments and demonstrate enthusiasm in educating the school and community. Now that the project is completed, it continues to provide the team with challenges. Unforeseen events such as strong winds and hail as well as rodents and weed eaters have threatened the bog; but since the team considers the habitat their own, they have accepted these challenges with enthusiasm.'

Storytelling and Puppet kits

Plant storytelling is another effective tool used in the GEPSN project to sensitize children to the plight of plants. Stories serve as a 'hook' to draw young students into the objectives for a lesson. Children meet plant personalities such as Richard Pitcher Plant and his friends who sing the 'Green Plant Blues' and describe their exciting lives as well as their problems. Grandpa Cedar (an endangered Atlantic White Cedar) speaks of his relatives who were cut down for use as telephone poles. The Trillium Triplets (a woodland genus that has lost much of its habitat in the

southeastern U.S.) tells a scary story about the day that Sucks (Japanese Honeysuckle - an invasive, introduced species in the southern U.S.) invaded their habitat and stole their home.

As problems are presented in stories, the door is opened to content learning and problem solving needed to help the characters. Some plants are admirable characters that provide humor and innocence. Donna Rosa, a Pink Ladyslipper orchid, is portrayed as a well known beauty queen who asks visiting reporters, *'Have you come to admire me? You can look but do not touch!'* She encourages people not to pick her since overcollecting is a major threat to her species. The children identify with the plant characters and their emotions and concern are engaged. They want to help these plants which might otherwise seem like obscure weeds.

Plant heroines convince children that they can make a difference through their work. Richard Pitcher Plant speaks lovingly of the kind human who rescued him from the tyranny of a bulldozer in a plant rescue and carried him to his present home in a botanical garden.

Jim Affolter, Chair, Georgia Plant Conservation Alliance, and Director of Research, State Botanical Garden of Georgia, states, *'The GEPSN project makes learning about endangered plants fun and stimulating, for both teachers and students. Because there are so many facets to the program - teacher training sessions, field work and gardening projects on the school sites, puppet shows and study kits - everyone has a chance to participate. Coupled with the program's well conceived teaching philosophy and strong follow-up support, this approach provides a recipe for success that could be repeated in many communities, wherever teachers are searching for ways to engage young students in issues and methods of plant conservation.'*

GEPSN Science Kits (currently under development) include puppets and scripts for teachers to instruct and entertain young students. Teachers will perform the endangered plant puppet shows for, or with, their children. High school classes and upper elementary students will carry puppet shows to classes of young students and pass on their concern and knowledge for endangered plants to these children. Puppet and story characters can help young children become stewards of our plant communities.

Project Support

Ongoing teacher support is an important project component. The GEPSN web page and newsletter (*The Green Plant Blues News*) provide information to support GEPSN teachers. The information includes a current seed list, notices about upcoming workshops, background on protected plants in Georgia, and booking information for the GEPSN Endangered Plant Science Kits. In summer 1998 funding was secured to hire an intern to help coordinate support services to teachers including a GEPSN plant hotline.

The project has been supported with funds from the Eisenhower Plan for Math and Science Education, the Georgia Initiative in Math and Science, the Turner Foundation and The Garden Club of Georgia.

▲ Résumé

Le réseau de formation sur les plantes en danger de Géorgie (GEPSN), est un projet de réintroduction de plantes en danger dans leur milieu d'origine, démarré en 1996 au jardin botanique de l'état de Géorgie, Athens, en Géorgie, aux USA. Les étudiants de niveau 2-12 deviennent spécialistes pour l'environnement par la multiplication de plantes indigènes menacées et en danger à partir de graines et la réintroduction de ces plantes dans leur site d'origine. Des scientifiques de l'Alliance Géorgienne pour la Conservation des Plantes, GPCA, fournissent informations et expériences. Des données (actions du pollinisateur, période de floraison, taux de germination) que les étudiants

récoltent, forment la base d'un très intéressant fichier de données.

Pour participer à ce réseau, le professeur assiste à un atelier d'entraînement pour apprendre l'essentiel sur les espèces en danger de Georgie et leurs habitats, sur la multiplication d'espèces indigènes, et ce qui concerne une enquête scientifique. Les participants reçoivent un permis officiel dans le cadre du programme sur l'Héritage du Patrimoine Naturel de Géorgie, une agence gouvernementale du département des ressources naturelles, pour faire pousser des plantes sans danger dans leur biotope. A travers le projet GEPSN des étudiants ont l'opportunité unique de faire pousser et de s'occuper d'espèces en danger. Cela permet de percevoir dans quel contexte éthique et environnemental les espèces en danger et leurs graines sont cultivées et dans quel but.

● Resumen

La GEPSN es un proyecto para la divulgación de plantas en peligro de extinción que se realiza en colegios y que empezó en 1996 en el Jardín Botánico del estado de Georgia, Athens, Georgia, U. S.A. Alumnos de b.u.p y c.o.u se preocupan por el medio ambiente mediante la plantación de semillas de plantas autóctonas y amenazadas en los colegios. Científicos de Georgia Plant Conservation Alliance (Alianza para la Conservación de las Plantas de Georgia), o GPCA, le ofrecen información y consejos. Los datos recogidos por los estudiantes (polinización, floración y porcentajes de germinación) forman las bases de interesantes informes de investigación.

Para participar en esta red, los profesores asisten a un taller de formación donde se preparan para aprender sobre las especies y hábitats en peligro de extinción de Georgia así como sobre la propagación de especies autóctonas, y las actividades de investigación relacionadas con las ciencias. Las clases que participan reciben permisos oficiales emitidos por el programa *Georgia Natural Heritage* (Patrimonio Natural de Georgia), una institución gubernamental dentro del

departamento de recursos naturales, que les autorizan al cultivo de las especies vegetales en peligro de extinción en su lugar de origen. A través del proyecto de la GEPSN los estudiantes obtienen la oportunidad única de hacer crecer y cuidar a las especies en peligro de extinción. Mientras los niños plantan, mantienen y cuidan de esas especies, empiezan a preocuparse por ellas y se plantan las semillas de una ética medioambiental.

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Left:
Zack prepares to plant one of the endangered pitcher plants.

A Garden for a Sustainable Future

Wales is known for its passion for life - for sports, the arts, music, its heritage and its beautiful landscapes. The new Garden of Wales embraces all of these themes.

The National Botanic Garden of Wales (NBGW) is a new national and international botanic garden and scientific institution dedicated to horticulture, conservation, research, environmental education, and leisure. The creation of the garden fills a long-felt need for Wales to have its own national garden like those in Scotland, England and Northern Ireland. It is the first botanic garden in Wales and represents a significant cultural development for the country. It is also the first major new botanic garden created in the United Kingdom for over two centuries.

The garden is a landmark £46 million Millennium project funded principally by the Millennium Commission. A flagship for 'preferred futures' it aspires to be a model to a sustainable way of living in harmony with our natural world.

The garden formally opens in May 2000 and we expect over 200,000 visitors every year. This paper describes the aims, philosophy, and key environmental principles that have guided our garden's development.

The Site

The garden is set in the 18th Century Regency Park of Middleton Hall in Carmarthenshire, Wales. The Estate comprises 568 acres. It is situated on the edge of the beautiful Towy Valley,

virtually free of pollution and with spectacular views of the surrounding countryside; steeped in Welsh history and culture.

The Middleton Estate was the creation of Sir William Paxton who bought it from the Middleton family in 1785. He built a fine Manor House with extensive stable outbuildings and walled gardens. By the early 1900s the estate and buildings had largely fallen into disrepair. The Carmarthenshire County Council later acquired it and in the early 1990s leased it to The Middleton Botanic Company (a Registered Charity) for 999 years at a peppercorn rent.

The garden lies in a rural area only a few miles from the industrial, urban south. Invisible to the park, the M4

Right:
Ivor Stokes,
Director of
Horticulture
shows off
the Great
Glasshouse at
the National
Botanic Garden
of Wales.



intersection is a few miles from the southern tip of the park providing easy access to visitors. The Welsh Office is building a grade-separated interchange to the M4 extension to facilitate easy access. The garden enjoys a varied topography, a network of lakes, a range of microclimates and has the added benefit of established woodlands and wild meadows.

Philosophy and Guiding Principles

At the garden we have a vision of a world where we understand, value, enjoy and sustain plants and fungi as vital elements in creating a sustainable relationship with life on earth. We wish to help people understand how plants work and contribute to human welfare. They will touch, smell, and taste plants yet above all enjoy the experience of living conservation, thus contributing towards a 'preferred future'.

Sustainability

The National Botanic Garden is a new institution being built at the turn of the second millennium. This has afforded a unique opportunity for Wales to create a landmark project designed and run using best environmental practice. The ethos of the garden arises from the concerns of the Rio de Janeiro Earth Summit, Agenda 21 and the aspirations of an emerging confident outward looking Wales taking its place in the modern world.

We are embracing sustainability as an overall theme offering innovative approaches to helping people make choices about their future - a preferred futures site.

One of the garden's key objectives will be to inform the public at large about the relationship between plants and global well being.

Principles of Action

There are four key principles of action:

- The garden will demonstrate real commitment to the principle and practice of environmental protection and sustainable development in all its operations.

- The garden will provide education, vocational training and encouragement to its employees and volunteers on environmental issues, so that they can pursue their work in an environmentally responsible manner.
- The garden will join and promote interdisciplinary networks of environmental specialists at the local, regional, national and international levels, encouraging collaboration on common environmental projects in education and research.
- The garden will share with the public its experience in running a site of best environmental practice.

These objectives will be pursued by:

- minimising energy consumption in providing optimum conditions for plant propagation and growth and visitor comfort
- giving preferential consideration to sustainable energy sources
- harvesting rainwater and minimum use of water for effluent disposal
- consumption of waste handled on site wherever feasible
- minimum light and noise pollution
- maximising energy efficiency and conservation while minimising ongoing maintenance
- championing health and safety yet ensuring accessibility
- biological control in glasshouses.

Several features will make the garden a centre for ecologically correct design. These include the burning of renewable biomass as a source of energy; the on-site natural purification of effluent using a Living Machine and natural reed-bed systems; the harvesting of rainwater for irrigation; and organic farming. Each of these is described briefly.

Renewable Energy

The threat of global warming and an imbalance of CO² in the Earth's atmosphere demand the harnessing of energy from renewable energy sources. Trees provide one of the best energy sources as they are huge batteries of stored solar energy absorbing much of the earth's CO² and releasing oxygen, that essential ingredient for life on earth. The garden has chosen to build a

wood-burning boiler. Wood will be harvested within the estate woodlands. Additional wood will be obtained from a biomass demonstration plantation and from material provided by landfill operators who are working with the garden to minimise organic material being disposed of in landfill sites. The installation of the garden's biomass boiler is commercially viable over the life cycle of the heating plant installation.

Wood is an attractive fuel. It will have provided twenty times more oxygen than it will need for its combustion in a process that will release no more carbon dioxide than that through natural decay. The smokestack emissions from this type of combustion do not contain the greenhouse gasses and acid rain producers that are associated with non-renewable fossil carbon fuels.

The Living Machine

A large proportion of the garden site is effectively 'green-field', as much of the original 18th century managed estate has been lost. This has provided an opportunity to incorporate resource use and waste management as an integral part of the scientific, educational and horticultural demonstration programmes, alongside the botanical and environmental programmes. Waste treatment is a key part of this integrated approach.

The garden's Living Machine is a natural wastewater treatment system. It operates under the same principles as those that regulate the natural ecology of forests and diverse water systems. Living machines are able to break down many harmful pollutants and purify wastewater. The processes are designed to replicate the cleaning effects of natural ecosystems.

Wastewater from throughout the garden will be pumped up to an equalisation and anaerobic digester (septic tank) covered by a planted biofilter. The settled waste will be regularly desludged and the solids removed to the compost-making operation. In the secondary settlement stage the wastewater travels to two underground closed tanks located close to but outside the greenhouse.

The effluent is then pumped into a standard green house through a series of four open aerobic tanks planted with floating rafts of aquatic plants ranging from invasive weeds to rare and endangered Welsh species. This intensifies the wastewater treatment and provides a very diverse ecology. After passing through a final biofilter it is passed into a reed bed inside the glasshouse from which place it is discharged into an external wetland for final cleansing. From there it is discharged onto a grassy hillside. The Living Machine will provide a year round opportunity to demonstrate how biological and ecological systems can be used to purify and recycle wastes. They can teach ecological design and show how nature recycles wastes and purifies water. The facility in the garden will be open to the public as a learning centre.

Rainwater Harvesting

Rainwater is captured off all buildings into underground water reservoirs, cleaned and recycled for irrigation within the Great Glasshouse and externally. The glasshouse has a

unique guttering system to enable it harvest the rainwater gently.

Organic Farming and Horticulture

The estate has one of the richest biodiversity landscapes in the region. We intend to signpost these so visitors can learn about Wales' contribution to agri-environmental schemes by demonstrating how Tir Cymen works and contributes to farming and enhancing biodiversity. Tir Cymen is a Welsh farming system that enhances wildlife.

The estate lands will be a flagship organic farm celebrating the massive shift in emphasis in south Wales towards organic farming - what it means to the consumer from cities in the region thereby building bridges between the countryside and the city. Our medium term plans are to become a centre for some rare Welsh breeds of farm animals and collections of old traditional cultivars of orchard trees and vegetable crops. There will also be a demonstration organic vegetable area.

The garden will feature one of Europe's few genetics gardens showing how plants have been changed by humankind from selection through to genetic engineering. This open-air exhibition will help local people develop their views on genetically engineered crops and produce, what they mean for their future and for Wales. The new technologies will have an important influence on human culture and raise serious moral and ethical issues.

The Attractions

Currently under construction, the garden's centre-piece will be one of the largest single span glasshouses in the world. Designed by Sir Norman Foster, the 'Great Glasshouse' replaces the former Middleton Hall, lost by fire in the 1930's, as the dominant building on the estate. When it is finished it will house a stunning landscape filled with a living collection of threatened plants from the Mediterranean regions of the World. A concourse gallery and 'Bioverse', a 'hands-on' educational adventure aimed at unlocking the mysteries of plant life, will complement this.

Right: The Great Glasshouse at the National Botanic Garden of Wales will be one of several major features of the new garden.



There will be many other attractions for the public of all ages including:

- An exhibition on herbal remedies of the Physicians of Myddfai set in the context of traditional healing practice worldwide.
- A unique genetic garden tracing plant genetics from ancient times to modern genetic engineering.
- New features for children from the Dwr Cymru/Welsh Water Discovery Centre, from a children's garden to a children's theatre.
- Ideas for gardens - suitable for the keen horticulturist or the gardening novice.
- A Garden of Gardens set in a large double walled garden with design and management input from visually impaired people, those with hearing and other physical impairments and other people with special needs. It will celebrate the history of garden design.

Education Programmes at the Garden

The vision of the education programme of the garden is to develop environmental initiatives that will support the people of Wales in becoming part of a sustainable world.

Our initiatives will complement and extend environmental education. We are convinced that the future is dependent on sustaining and improving the long-term quality of natural habitats, the countryside and the richness of living organisms. By 2010 the garden will have become a leading environmental education organisation offering a wide-ranging programme of courses, visits, workshops, seminars, conferences, open days, public lectures and learning materials. The garden will be a champion about raising awareness about plants and fungi and their role in developing preferred futures centred on sustainability.

We will:

- build on the increased public awareness and interest in the environment
- help improve the science and environmental understanding and skills of teachers

- strengthen the connection between formal education and informal institutions
- promote whole organism and ecosystematic approaches to the environment
- influence changes in curricula
- use leading edge technology in our education programmes
- support the public in their quest for a better understanding of environmental issues and conservation
- provide materials and activities for parents and their children.

Wales' new garden will be a living model of sustainability and a place to learn about how we can live within and work with nature.

▲ Resumé

Le Jardin Botanique national de Galles ouvrira en mai 2000. C'est un nouveau jardin botanique national et international et une institution scientifique dédiée à l'horticulture, la conservation, la recherche, l'éducation à l'environnement et aux loisirs. Au milieu du jardin se trouvera une des plus grandes serres d'un seul tenant du monde présentant une collection vivante des plantes menacées des régions méditerranéennes du globe.

La gestion durable des ressources est le point fédérateur du jardin émanant du principe de la convention de Rio et de l'agenda 21. L'énergie pour le chauffage et l'éclairage est générée par un système de combustion utilisant la biomasse du bois et les déchets sont traités sur place par l'utilisation de banquettes de plantes aquatiques. Les systèmes sont offerts à la vue du public. Le jardin présente aussi des systèmes organiques de croissance des plantes utilisés dans les méthodes traditionnelles de cultures, pour le restaurant qui se trouve sur place. L'objectif du programme éducatif est de développer des initiatives environnementales à destination des gens du pays de Galles et de leur faire découvrir la gestion durable des ressources. Il est prévu qu'en 2010 le jardin deviendra un leader dans l'éducation à l'environnement offrant un vaste programme de cours, visites, ateliers, séminaires, conférences,

portes ouvertes, conférences publiques et matériaux destinés à l'enseignement.

● Resúmen

El jardín botánico nacional de Gales, abrirá sus puertas al público en mayo del año 2000. Es un nuevo jardín botánico nacional e internacional, así como una institución científica que se dedica a la horticultura, conservación, investigación, educación medioambiental y al ocio. En el centro del jardín estará situado uno de los invernaderos más grandes del mundo con un diseño especial, que posee una colección de plantas en peligro de extinción del mediterráneo.

La sostenibilidad (palabra que en español no existe) es la parte más importante del jardín cuyas bases proceden de los asuntos tratados en la Cumbre sobre la Tierra de Río de Janeiro y de la *Agenda 21*. La energía para calentar e iluminar se genera mediante un calentador de biomasa de madera y vertidos tratados en el lugar mediante el uso de Juncales. Ambos sistemas están expuestos al público. El jardín intenta también que las plantas crezcan ecológicamente usando métodos agrícolas tradicionales, para su uso en el restaurante de allí.

La visión del programa de educación es desarrollar iniciativas medioambientales que protejan a las personas de Gales y que formen parte de un mundo en equilibrio. Sobre el año 2010, se prevé que el jardín se convierta en una organización líder en educación ambiental que ofrece un amplio programa de cursos, visitas, talleres, seminarios, conferencias, días de apertura, charlas y materiales de aprendizaje.

Professor Charles Stirton is the Director of the National Botanic Garden of Wales, Middleton Hall, Llanarthne, Carmarthenshire, SA32 8HG, Wales, UK.
Tel: (44) 1558 668768
Fax: (44) 1558 668933
<http://www.gardenofwales.org.uk>

Lectures

Resources

Recursos

resources

Environmental Education in Botanic Gardens: Guidelines for developing individual strategies.

Verband Botanischer Gärten e.V.,
Wilhelma, Postfach 50 12 27, D-70342
Stuttgart, Germany.

BGCI's guidelines on Environmental Education in Botanic Gardens have been translated into German by the Verband Botanischer Gärten e.V. The guidelines keep closely to the original version and three new case studies from German botanic gardens have been included. The publication was generously supported by: Stiftung Naturschutz Hamburg und Stiftung zum Schutze gefährdeter Pflanzen, Blumeninsel Mainau G.m.b.H, Verband Botanischer Gärten e.V. Verein zur Förderung des Schulbiologiezentrums Hannover.

Guides for Learning and Teaching about Sustainability

Fien, J. (Ed). UNESCO Principal Regional Office for Asia and the Pacific, Bangkok PO Box 967, Prakanong Post Office Bangkok 10110, Thailand and Faculty of Environmental Sciences, Griffith University Nathan Qld 4111 Australia. ISBN 0 909291 37 3 (Learning) 0 86857 644 1 (Teaching).

Learning for a Sustainable Environment: Professional Development Guide for Teacher Educators and the Teaching for a Sustainable World Guide have been produced as part of a joint project between Griffith University, Australia and the UNESCO Asia Pacific Centre for Education Innovation for Development. Each guide provides

lectures

Education a l'environnement dans les jardins botaniques : les politiques à suivre pour développer les stratégies particulières

Verband Botanischer Gärten e. V.,
Wilhelma, Postfach 50 12 27, D-70342
Stuttgart, Germany

Les guides du BGCI sur l'éducation à l'environnement dans les jardins botaniques ont été traduits en allemand par les jardins botaniques allemands. Les guides restent fidèles à la version originale et trois nouveaux « cas d'étude » de jardins botaniques allemands ont été inclus.

La publication a généreusement été financée par le Stiftung Naturschutz Hamburg und Stiftung zum Schutze gefährdeter Pflanzen, Blumeninsel Mainau G.m.b.H, Verband Botanischer Gärten e.v. Verein zur Förderung des Schulbiologiezentrums Hannover.

Guides pour l'apprentissage et l'enseignement de l'exploitation durable des ressources

Fien, J. (Ed.): UNESCO Principal Regional Office for Asia and the Pacific, Bangkok PO Box 967, Prakanong Post Office Bangkok 10110, Thailand and Faculty of Environmental Sciences, Griffith University Nathan Qld 4111 Australia. ISBN 0 909291 37 3 (Learning) 0 86857 644 1 (Teaching).

Guides pour le développement professionnel de l'apprentissage de la gestion durable de l'environnement, à l'usage des professeurs éducateurs. Les guides pour l'enseignement à une

recursos

La educación medioambiental en los jardines botánicos: directrices para el desarrollo de estrategias individuales

Verband Botanischer Gärten e.V.,
Wilhelma, Postfach 50 12 27, D-70342,
Stuttgart, Alemania.

El Verband Botanischer Gärten ha traducido al alemán las directrices sobre educación medioambiental en los jardines botánicos. En general se ha mantenido fiel al original, aunque se han añadido tres nuevos estudios llevados a cabo por jardines botánicos alemanes. La publicación se financió gracias al apoyo de las siguientes instituciones: Stiftung Naturschutz Hamburg und Stiftung zum Schutze gefährdeter Pflanzen, Blumeninsel mainau G.m.b.H, Verband Botanischer Gärten e.V. Verein zur Förderung des Schulbiologiezentrums Hannover.

Cómo aprender y enseñar sobre el equilibrio ("sostenibilidad")

Fien, J. (Ed). UNESCO Principal Regional Office for Asia and the Pacific, Bangkok, PO Box 967, Prakanong Post Office, Bangkok 10110, Thailand.

Faculty of Environmental Sciences, Griffith University, Nathan Qld 4111, Australia. ISBN 0909291 373 (aprendizaje) y 086857 6441 (enseñanza).

Los libros [Learning for a Sustainable Environment Professional Development Guide for Teacher Educators](#) y el [Teaching for a Sustainable World Guide](#) han sido elaborados conjuntamente por la Universidad Griffith (Australia) y

resources

professional development opportunities for teacher educators by engaging them in a process of learning and teaching and by providing ideas to further develop innovative environmental education in their teaching materials. The guide modules are "regional" versions that have been prepared after trials in many different countries and users are invited to adapt the modules to meet their needs and specific circumstances. Each module includes an introduction, identified outcomes, a workshop outline, a list of materials required and a list of additional reading. The guides have been widely disseminated to National Curriculum Development Centres worldwide to support the development of teaching material in this field.

Learn About Bees!

Regional Botanic Garden – CICY, Apdo. Postal 87, Cordemex 97310, Mérida, Yucatan México.
Tel: (52) 99 813921
Fax: (52) 99 813900.
Email: orellana@cicy.cicy.mx
(\$15 USD incl. Postage)

The Living Bees and their Classification Teacher's Pack is a resource for primary and secondary school teachers that provides information on the characteristics of bees, their classification, biodiversity, ecological importance and evolution. The resource aims to increase teacher awareness about the importance of our attitudes towards life and the environment. It includes a poster of the five kingdoms and a CICY trail brochure, which aims to assist students in recognising examples of the different kingdoms. This trail design can be adapted for other botanic gardens.

Plant Power

The University of Oxford Botanic Gardens Rose Lane, Oxford OX1 4AX, UK. Tel / Fax: (44) 1865 276920.

The University of Oxford Botanic Gardens have produced a poster aimed at 7-11 year olds that explain how plants are used in our everyday

lectures

gestion durable de la planète ont été produits en tant que partie d'un projet conjoint entre l'Université Griffith en Australie et le Centre Asie Pacific de l'UNESCO pour l'éducation et l'innovation pour le développement.

Chaque guide fournit des idées de développements professionnels pour des enseignants éducateurs, en les engageant à un processus d'apprentissage et d'enseignement d'idées tendant à développer une éducation innovante pour l'environnement dans leur matière d'enseignement. Le guide présente des versions régionales qui ont été préparées après des essais dans différents pays et les usagers sont invités à adapter ces éléments à leurs besoins et aux circonstances spécifiques. Chaque élément inclut une introduction, des résultats reconnus, un canevas pour des ateliers, une liste du matériels nécessaire et une liste de lectures complémentaires. Les guides ont été largement distribués à des centres de développement d'études nationaux dans le monde entier pour inciter le développement de matériel d'enseignement dans ce domaine.

Connaitre les abeilles!

Regional Botanic Garden – CICY, Apdo. Postal 87, Cordemex 97370, Mérida, Yucatan México.
Tel : (99) 81 39 21
Fax : (99) 81 39 00.
Email : HYPERLINK
mailto:orellana@cicy.cicy.mx
orellana@cicy.cicy.mx (\$15 USD incl. Postage)

« *Les abeilles vivantes et leur classification* » est un pack destiné aux enseignants, matériel pour des professeurs d'écoles primaires et secondaires et fournit des informations sur les caractéristiques des abeilles, leur classification, la biodiversité, leur importance écologique et leur évolution. Cette source d'informations a pour but d'augmenter la connaissance du professeur sur l'importance de notre comportement vis à vis de la vie et de l'environnement. Est inclus un poster

recursos

el Centro de Innovación Educativa para el Desarrollo de la UNESCO en el Pacífico asiático. Cada libro proporciona oportunidades de desarrollo profesional a los educadores, ya que les introduce en un proceso de aprendizaje y enseñanza. Ofrece también algunas ideas que les ayudan a desarrollar un método de enseñanza medioambiental innovador en sus clases. Los módulos guía consisten en versiones "regionales" que han sido realizadas después de diversos ensayos en diferentes países. Los usuarios pueden, si lo desean, adaptar los módulos a sus necesidades y circunstancias específicas. Cada uno de ellos incluye una introducción, soluciones fácilmente identificables, un plan de estudio, una lista de materiales y bibliografía. Los libros se encuentran ampliamente distribuidos por los centros nacionales de desarrollo de programas de estudio de todo el mundo como apoyo para la difusión del material didáctico en este campo.

¡Aprendamos de las abejas!

Regional Botanic Garden-CICY, Apdo Postal 87, Cordemex 97310, Mérida, Yucatán, México. Tel:(99)81 39 21
Fax:(99)81 39 00
Email:orellana@cicv.cicy.mx
(\$15 con gastos de envío incluidos).

La edición para el profesor de la obra *The Living Bees and their Classification* está dirigida a educadores de primaria y secundaria. En ella se habla sobre las características, la clasificación, la biodiversidad, importancia ecológica y evolución de las abejas. Con esta publicación se intenta concienciar a n más a los profesores sobre la importancia de nuestras posturas hacia la vida y el medio ambiente. Se incluye también un cartel en el que se muestran los cinco reinos en que se dividen y un folleto explicativo de la CICY que ayuda a los estudiantes a reconocer los diferentes reinos. Si se desea, se puede adaptar este tipo de folletos para su utilización en otros jardines botánicos.

El poder de las plantas

The University of Oxford Botanic

resources

lives. The poster was sponsored by The Committee of the Public Understanding of Science (COPUS) and is available free of charge.

Reading the Landscape

C.R.E.P.A., Case Postale 16, CH-1933 Sembrancher, Switzerland.

Fax: (41) 27 782 2220; Didier Roguet Conservatoire et Jardin Botaniques, Case Postale 60, CH-1292 Geneva, Switzerland. Fax: (41) 22418 5101.

The Conservatoire et Jardin Botaniques (CJBG), Geneva, Switzerland, in conjunction with the Centre Régional d'études des Populations Alpines, has produced a new volume in their educational series. *Reading the Landscape* is the fifth part of *The Child Listens to its Village Series*. The aim of the *Reading the Landscape* project is to awaken an interest in children for their physical environment and to encourage communication and a transfer of information between grandparents and their grandchildren about our natural heritage. As well as being a useful information resource on alpine geology and geography, the volume provides details on how the project was implemented and its results.

Resources Developed by Children

Peace Child International, The White House, Buntingford, Herts SG9 AH UK. Tel: (44) 176 327 4459 Fax: (44) 176 327 4460. £3.99 for package, £1.50 for Teacher Guide incl. postage

Peace Child Publications produces a range of publications that have been written, illustrated and edited by young people from all over the world working in partnership with adult professionals. Their latest publication, *Junior Indicator Package*, has been developed for children by children at the primary school level. The pack is an excellent way to introduce and explain the concept of sustainable development to young people from all walks of life. A teacher guide is also included.

lectures

des cinq règnes vivants et un livret guide qui est destiné à aider les étudiants à reconnaître des exemples des différents règnes.

Ce parcours de jardin peut être adapté pour d'autres jardins botaniques.

Le pouvoir des plantes

The University of Oxford Botanic Gardens Rose Lane, Oxford OX1 4AX, UK. Tel/Fax : (44) 0 15 1 478 4427.

Les Jardins Botaniques de l'Université d'Oxford ont réalisé un poster ayant pour but l'explication pour les 7/11 ans de l'utilisation des plantes dans la vie de tous les jours. Le poster a été financé par le Comité pour la compréhension des sciences pour le public (COPUS) et est disponible gratuitement.

Lecture du paysage

C.R.E.P.A., Case Postale 16, CH-1933 Sembrancher, Switzerland.

Fax : 41 27 782 2220 . Didier Roguet Conservatoire et Jardin Botaniques, Case Postale 60, CH-1292 Geneva, Switzerland. Fax : 41 (0) 22418 5101

Le conservatoire et Jardin Botanique de Genève (JDBG), en Suisse, conjointement avec le Centre Régional d'Etudes des populations alpines, a produit un nouveau volume dans la série pour l'éducation. « *Lire le paysage* » est la cinquième partie de la série « *les enfants à l'écoute de leur village* ». Le but de ce projet « *lecture du paysage* » est d'éveiller l'intérêt des enfants pour leur environnement physique et d'encourager la communication et l'échange d'informations entre les grands-parents et leurs petits-enfants sur leur patrimoine naturel. En plus d'être une source d'informations utiles sur la géologie alpine et la géographie ce volume fournit des détails sur la façon dont le projet est mené et les résultats.

Documents produits par les enfants

Peace Child International, The White House, Buntingford, Herts SG9 AH UK. Tel : 44 176 327 4459 Fax : 44 176 327 4460 £3.99 for

recursos

Gardens, Rose Lane, Oxford OX1 4AX, UK. Tel/Fax:(44)01514784427.

El Jardín Botánico de la Universidad de Oxford ha elaborado un cartel dirigido a niños de entre 7 y 11 años en el que se explica el uso que hacemos de las plantas en la vida diaria. Está costeado por el Comité para el Conocimiento General de la Ciencia (COPUS) y se puede conseguir sin coste alguno.

Observemos nuestro entorno

C.R.E.P.A., Case Postale 16, CH-1933, Sembrancher, Switzerland.

Fax:41277822220. Didier Roguet Conservatoire et Jardin Botaniques, Case Postale 60 CH-1292, Geneva, Switzerland. Fax:41(0)224185101.

El Conservatoire et Jardin Botaniques (CJBG) de Ginebra y el Centre Régional d'etudes des Populations Alpines han editado un nuevo volumen de su serie sobre la educación. *Reading the Landscape* es la quinta entrega de la serie *The Child Listens to its' Village*. El objetivo de esta nueva entrega es despertar el interés de los niños por su entorno y animar a la comunicación y al intercambio de información sobre nuestra herencia natural entre abuelos y nietos. Este volumen, además de ser una fuente de información muy útil sobre la geología y la geografía de los Alpes, proporciona detalles sobre cómo se llevó a cabo el proyecto y sus resultados.

Recursos desarrollados por niños

Peace Child International, The White House, Buntingford, Herts SG9 AH, UK. Tel:44 1763274459 Fax:44 1763274460. £3.99 el lote completo, £1.50 la guía para el profesor (gastos de envío incluidos).

Peace Child Publications edita una serie de publicaciones escritas, ilustradas y editadas por jóvenes de todo el mundo que trabajan en colaboración con profesionales adultos. Su última publicación, titulada *Junior Indicators Package*, ha sido elaborada por niños y está dirigida a niños de primaria. Se trata de una

resources

A Technology Education Resource Kit

Intermediate Technology The Schumacher Centre for Technology and Development. Bourton Hall, Bourton-on-Dunsmore Rugby, Warwickshire CV23 9QZ, UK.

A Technology Education Resource Pack entitled *Source to Sale* has been produced to provide support for teachers who want to introduce a global perspective into their teaching, particularly through the design and technology curriculum. The pack features several resources locally available in Kerala, South India and traces their uses and development from raw materials to products. Kerala was chosen because it provides a rich context through which to address key aspects of technology education. The activities in the pack aim to encourage students to draw parallels between cultures and to learn from and about other people, therefore broadening their perspective on global issues. The pack includes a teacher's handbook, poster and set of pupil sheets.

ELECTRONIC RESOURCES

<http://www.amnh.org/index.html>

The American Museum of Natural History site includes information on its new biodiversity exhibition. The site also provides details on publications, activities, news and events and aspects of the centre's programmes, for example the museum's outreach program. Winners of the Young Naturalists Awards have their articles displayed on the site and include topics such as the Poison Dart Frog.

<http://www.education.unesco.org>

The UNESCO Education Information Service site has areas dedicated to such topics as adult education, education of girls and women, educational materials and publications. This site is regularly updated and provides details on useful resources for educators. One such resource that has been developed is the multimedia kit 'UNESCO: 50 Years of Extinction'

lectures

package, £1.50 for Teacher Guide incl. postage

Les publications Peace Child produisent une série écrite illustrée et éditée par la jeunesse pour ceux qui dans le monde entier travaillent en partenariat avec des adultes professionnels. Leur dernière publication, *Junior Indicator Package*, a été produite pour des enfants par des enfants d'école primaire. Ce pack est un excellent moyen d'introduire et d'expliquer le concept de développement durable aux jeunes gens de tous les styles de vie. Un guide de l'enseignant est aussi inclus.

Kit d'information sur l'éducation technologique

Intermediate Technology The Schumacher Centre for Technology and Development. Bourton Hall, Bourton-on-Dunsmore Rugby, Warwickshire CV23 9QZ, UK.

Ce kit intitulé « *source à vendre* » a été produit pour fournir un support aux enseignants qui cherchent à introduire une notion globale dans leur enseignement particulièrement à travers le design et un programme d'étude technologique. Ce pack accompagne plusieurs documents localement disponibles dans le Kerala au sud de l'Inde et décrit les usages et la fabrication depuis les matières premières jusqu'aux produits. Kerala a été choisi parce qu'il fournit un riche contexte à travers lequel on peut envisager les aspects clés de l'éducation technologique. Les intentions de ce pack sont d'encourager les étudiants à établir des comparaisons entre les cultures et l'apprentissage sur les autres peuples, et au delà de leurs horizons, sur des finalités tangibles. Le pack comprend un guide pour enseignant, un poster et un lot de feuilles d'exercices pour l'écologiste.

RESSOURCES ELECTRONIQUES

<http://www.education.unesco.org>

Le site du service d'information pour le service de l'UNESCO présente des

recursos

excelente manera de dar a conocer y explicar a jóvenes de toda condición el concepto de desarrollo sostenible. También se incluye una guía para el profesor.

Material didáctico para la enseñanza de la tecnología

Intermediate Technology The Schumacher Centre for Technology and Development, Bourton Hall, Bourton-on-Dunsmore Rugby, Warwickshire CV23 9QZ, UK.

Source to Sale es una obra publicada con la finalidad de ayudar a los profesores que deseen incorporar una perspectiva global a su método de enseñanza, centrado sobre todo en el diseño y la tecnología. Se incluyen varios ejemplos de programas llevados a cabo en Kerala (India meridional) y se detallan los posibles usos y los pasos que se siguen para convertir las materias primas en productos. La elección de Kerala se debió a que proporcionaba un contexto inmejorable para tratar los aspectos clave de la enseñanza de la tecnología. Las actividades recomendadas sirven para animar a los niños a encontrar paralelismos entre las distintas culturas, así como para aprender de y sobre otras personas, ampliando de este modo su visión de los temas universales. El pack incluye también un manual para el profesor, un cartel y material para los alumnos.

RECURSOS ELECTRONICOS

<http://www.education.unesco.org>

La página web del Servicio de Información Sobre Enseñanza de la UNESCO tiene partes dedicadas a la educación de adultos, la educación femenina, materiales educativos y publicaciones.

Además de actualizarse con regularidad, da valiosa información sobre los recursos más útiles para los educadores, entre los que se encuentra un equipo multimedia llamado UNESCO, 50 Years of Extinction, que consta de un folleto y dos CD-roms. En él se da información

resources

which consists of a brochure and two CD-Roms. This kit provides information that documents the evolution of key education issues and of UNESCO's worldwide action in this area since 1948.

<http://www.monsanto.co.uk>

Public opinion on genetically modified crops varies. Monsanto has developed a website that provides information on the positive aspects of biotechnology as well as access, via html links, to an extensive range of reports, articles and data from its opponents, including Greenpeace. From Monsanto's point of view this will enable people to make informed decisions about the positive and negative factors involved with genetically altered food.

lectures

pages dédiées à des sujets tels que l'éducation des adultes, l'éducation des jeunes filles et des femmes, le matériel éducatif, et à des publications. Ce site est remis à jour régulièrement et fournit des précisions sur les ressources utiles pour les éducateurs. Une telle ressource a été développée dans le kit multimédia, « *UNESCO 50 ans d'expression* » qui consiste en une brochure et deux CD Rom. Ce kit fournit des informations qui informent sur l'évolution des documents, sur les clés de l'éducation et sur l'action de l'UNESCO dans ce domaine depuis 1948.

<http://www.monsanto.co.uk>

L'opinion publique sur les organismes génétiquement modifiés est partagée. Monsanto a développé un site web qui fournit de l'information sur les aspects positifs de la biotechnologie et en plus un éventail étendu de rapports, articles et données sur ses opposants, Greenpeace inclus. D'après le point de vue de Monsanto ceci rendra les gens capables de prendre des décisions en connaissance de cause sur les facteurs positifs et négatifs dans l'alimentation génétiquement modifiée.

<http://www.amnh.org/index.html>

Le site du Muséum d'Histoire Naturelle américain présente des informations sur sa nouvelle exposition sur la biodiversité. Le site donne aussi des détails sur les publications, les activités, les nouvelles, les événements, sur les programmes du centre comme les productions du Muséum. Les articles des « *Lauréats de la voie des jeunes naturalistes* » sont présentés sur le site et comprennent des titres tels que le crapaud au dard empoisonné.

recursos

que prueba la evolución de los temas claves de la educación, así como de las acciones a escala mundial de dicha organización en ese campo desde 1948.

<http://www.monsanto.co.uk>

La opinión general sobre las cosechas manipuladas genéticamente varía. Monsanto ha elaborado una página web en la que se informa sobre los aspectos positivos de la biotecnología, además de incluir un gran número de informes, artículos e información de sus detractores, incluyendo la organización ecologista Greenpeace. Monsanto confía en que ayude a las personas a tomar decisiones con conocimiento de causa sobre los factores, tanto positivos como negativos, que rodean a los productos manipulados genéticamente.

<http://www.amnh.org/index.html>

La página web del Museo de Historia Natural Americana incluye noticias sobre la nueva exposición sobre biodiversidad del centro. También se pueden encontrar datos sobre publicaciones, noticias y acontecimientos, así como detalles de los programas del centro, como es el caso del programa de ayuda social del museo. Los ganadores de los Young Naturalists Awards tendrán la oportunidad de ver sus artículos publicados en la página, que incluye temas como el de una especie de rana venenosa (Poison Dart Frog).

Focus on

Networks

■ Networks

Botanic Gardens Education Network (BGEN)

The Botanic Gardens Education Network (BGEN) started in Britain in 1987 when several enthusiastic educators from botanic gardens began getting together to share their expertise and to address the challenges which they faced in promoting botanic gardens for education. The network gained considerable impetus when, in September 1989, they held their first conference. Since then, the network has expanded to include numerous botanic gardens throughout Britain, many private and public gardens and arboreta, as well as private individuals with an interest in botanical education.

BGEN's objectives are to:

- foster a greater awareness of the diversity of plants, among people of all ages and cultures
- provide a bridge between visitors and the varied skills and expertise of the staff of the gardens and arboreta
- encourage a responsible attitude towards the environment and its conservation
- interpret living plant collections and other resources.

An important aspect of BGEN membership is attendance at the annual conference held and sponsored by member gardens. This provides an opportunity for members to share ideas both formally and informally while addressing issues specific to botanic gardens and their role in education.

Fronds, the BGEN quarterly newsletter, keeps members up to date with developments in member gardens and

▲ Networks

Le réseau éducatif des jardins botaniques (BGEN)

Le réseau éducatif des jardins botaniques (BGEN) débuta en Grande-Bretagne en 1987 quand plusieurs éducateurs enthousiastes de jardins botaniques commencèrent à partager leurs expériences et exposer les défis auxquels ils avaient à faire face dans la promotion des jardins botaniques pour l'éducation.

L'organisation monta vraiment en puissance quand en septembre 1989, ils tinrent leur première conférence. Depuis l'organisation s'est étendue jusqu'à inclure de nombreux jardins botaniques à travers la Grande Bretagne, beaucoup d'arboreta, des jardins publics et privés, aussi bien que des personnes ayant un intérêt pour l'éducation en botanique.

Les objectifs du BGEN sont :

- procurer une meilleure connaissance de la diversité des plantes aux gens de tous âges et toutes cultures
- établir une passerelle entre les visiteurs et les différentes habilités et expériences du personnel des jardins et des arboretums.

● Networks

Red Educativa de los Jardines Botánicos (BGEN)

La red de educadores en los jardines botánicos tuvo sus inicios en Gran Bretaña en 1987 gracias al entusiasmo de varios profesores que se reunían para compartir sus conocimientos y hablar sobre los retos a los que se enfrentaban al promover la enseñanza en estos jardines. La organización ganó una importancia considerable cuando, en septiembre de 1989, dieron su primera conferencia. Desde entonces, la organización se ha ampliado y actualmente incluye a un gran número de jardines botánicos de toda Inglaterra, y a jardines públicos y arboretos así como a cualquier persona interesada en la educación botánica.

Los objetivos de la BGEN son:

- Facilitar a personas de cualquier edad y cultura un conocimiento más amplio de la gran variedad de plantas que existen.
- Establecer una unión entre los visitantes y las diversas habilidades y conocimientos del personal de los jardines y de los arboretos.



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provides reviews of resources of interest to educators in botanic gardens. This useful link between members is supported by an annual yearbook, which, while providing a directory of members and summary of conference proceedings, includes information on current trends in education and details on research currently being carried out in education in botanic gardens.

Each year BGEN provides a number of training days for its members, which are also open to other interested educators. These days provide opportunities for professional development by capitalising on the expertise and experience of established educational service providers and generating links between gardens, giving guidance and providing inspiration.

Below:
Children at the
Sir Harold Hillier
Gardens and
Arboretum
(BGEN member)
doing a mirror
walk to observe
the tree canopy.

Mr Kevin Beckett
Education Officer
Westonbirt Arboretum
Tetbury
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- promouvoir une attitude responsable vis à vis de l'environnement et de sa conservation
- interpréter les collections de plantes vivantes et les autres ressources.

Un important aspect de la participation des membres du BGEN est d'assister à la conférence annuelle, aidée et sponsorisée par les jardins membres. Elle fournit une opportunité pour échanger des idées de façon classique mais aussi informelle, tandis que sont exposées des conclusions spéciales pour les Jardins Botaniques et leur rôle dans l'éducation.

Fronds, la lettre trimestrielle du BGEN, tient les membres au courant des actions des jardins membres et fournit des revues de presse pour les éducateurs dans les jardins botaniques. Ce lien utile entre les membres est complété par une publication annuelle qui, tout en produisant un annuaire des membres et un résumé des communications des conférences donne également de l'information sur des manifestations en éducation et des détails sur les recherches courantes menées dans le domaine de l'éducation dans les jardins botaniques.

Chaque année le BGEN organise un certain nombre de jours d'ateliers pour ses membres mais qui sont souvent ouverts aux autres éducateurs intéressés. Il donne l'occasion d'augmenter sa connaissance professionnelle en accumulant de l'expérience et des méthodes aux vues d'autres services pour l'éducation et en générant des liens entre les jardins pouvant inspirer des méthodes.

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- Fomentar una actitud responsable en favor del medio ambiente y su conservación.
- Informar sobre las colecciones de plantas vivas y otros recursos.

Un aspecto importante de los miembros de la BGEN es la asistencia a la conferencia anual presentada por miembros de los jardines. De esta manera se ofrece una oportunidad para intercambiar ideas en la conferencia y fuera de ella entre los miembros, al mismo tiempo que discuten sobre los asuntos específicos para los jardines botánicos y su papel en la educación.

"Fronds", el infonne que envía trimestralmente la BGEN, mantiene al día a los miembros en cuanto a novedades de jardines y proporciona algunos recursos que pueden interesar a los educadores de los jardines botánicos. Esta provechosa unión entre los miembros se apoya en el libro que anualmente ofrece una lista de los socios y un resumen de los procedimientos de la conferencia. Este anuario también incluye información acerca de tendencias actuales en la educación y detalles sobre investigaciones que se están realizando en el campo de la educación en los jardines botánicos.

Cada año la BGEN ofrece unos días de formación para sus socios, siempre abiertos a recibir a otros educadores interesados. Así se dan oportunidades para el desarrollo profesional aprovechando los conocimientos y la experiencia de los proveedores del servicio de educación establecido. Así mismo se crea un nexo entre la tarea informativa de los jardines y su papel como lugar de ocio.

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