

roots

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Growing the Social Role of Botanic Gardens

A pathway to change:
environmental
science career
training for youth

Building bridges over divided
communities

Nature based therapy

Engaging British Muslims in
environmental issues



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EDITOR
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First word

Crossroads or cul-de-sac?

Mapping a social future for botanic gardens

ENGLISH

At the time of writing, in early 2011, North Africa and the Middle East are convulsed by social and political turmoil. Although the long-term outcome of such events is difficult to predict, one could argue that they form part of a continuum, a movement of the tectonic plates of the human story that has quickened in recent decades. Following the dissolution of the Cold War polarities that dominated the second half of the 20th century, the last twenty years have witnessed extraordinary socio-political and economic realignments around the world, especially among the emerging powers of Asia and Latin America.

Massive population growth and the headlong dash to urbanisation have been some of the unintended consequences of such changes, especially in the developing world. Current UN estimates place over half the human population in towns and cities, a trend that is likely to accelerate over coming decades. This has given rise to a paradox and one of the conundrums of our age, namely that at a time of near consensus among informed observers about the dangers posed by global climate change and biodiversity loss, humankind in general is turning its back on the natural world.

What are the implications of these seismic changes for organizations like botanic gardens, located as they are at the intersection of society and nature? What is their role? And how do they ensure their relevance as agents for learning and action? These are some of the questions addressed by our contributors to this latest edition of *Roots*.

FRANÇAIS

Au moment d'écrire, en ce début 2011, l'Afrique du Nord et le Moyen-Orient traversent un bouleversement social et politique. Bien que les résultats à long terme de tels événements soient difficilement prévisibles, l'on pourrait prétendre que ces derniers font partie d'un continuum, qu'il s'agit d'un mouvement des plaques tectoniques de l'histoire humaine qui s'est accéléré au cours des dernières décennies. Suite au dissolution des oppositions de la guerre froide qui ont dominé la seconde moitié du 20^{ème} siècle, ces vingt dernières années ont connu d'extraordinaires remaniements économiques et sociopolitiques de par le monde, notamment parmi les puissances émergentes d'Asie et d'Amérique latine.

Une croissance démographique massive et une ruée vertigineuse vers l'urbanisation sont parmi les conséquences non désirées de tels changements, particulièrement dans les pays en développement. Selon les estimations actuelles des Nations Unies, plus de la moitié de la population humaine se trouve dans les villes, une tendance probablement vouée à s'accélérer au cours des décennies à venir. Cela a engendré un paradoxe et créé l'une des énigmes de notre temps, à savoir que l'humanité en général tourne le dos au monde naturel à une époque de quasi-consensus entre experts concernant les dangers liés aux changements climatiques mondiaux et à la perte de la biodiversité.

Quelles sont les implications de ces changements sismiques pour des organismes comme les jardins botaniques, situés ainsi au croisement

ESPAÑOL

Mientras esto escribo, apenas iniciado el año 2011, el norte de África y el medio oriente se convulsionan por disturbios sociales y políticos. A pesar de que a largo plazo el desenlace de dichos eventos es difícil de predecir, uno puede argumentar que éstos forman parte de un continuo, un movimiento de tectónica de placas en la historia de la humanidad que se ha acelerado en las últimas décadas. Siguiendo la disolución de las polaridades de la Guerra Fría que predominaron en la segunda mitad del siglo XX, los últimos veinte años han sido testigos de extraordinarios realineamientos socio-políticos y económicos alrededor del mundo, especialmente entre las potencias emergentes de Asia y América Latina.

El explosivo crecimiento demográfico y la precipitada carrera hacia la urbanización han sido algunas de las inesperadas consecuencias de dichos cambios, principalmente en los países en desarrollo. Las estimaciones de las Naciones Unidas indican que más de la mitad de la población vive en ciudades y zonas urbanas, tendencia que muy probablemente se acentuará en las próximas décadas. Lo anterior ha llevado a la paradoja y uno de los acertijos de nuestra era, a saber, que en la actualidad el consenso más cercano entre los observadores informados sobre los peligros que plantean el cambio climático y la pérdida de biodiversidad, es que el la humanidad en general le está dando la espalda al mundo natural.

¿Cuáles son las implicaciones de estos cambios sísmicos en organizaciones como los jardines botánicos los cuales se ubican en la intersección entre la

Jocelyn Dodd and Ceri Jones from the University of Leicester in the UK tackle the subject head-on in their article, which draws on recent BGCI-commissioned research. They argue that in this era of growing human dislocation from the natural world, when the evidence for global climate change and consequential species extinction is so compelling, botanic gardens possess enormous potential as agents of social and environmental action. Despite a cultural shift towards greater social relevance, the authors found that UK gardens have so far been slow to broaden their audiences and engage with community concerns.

An example of community action for sustainability comes from Aburi Botanic Gardens in Ghana. According to Aburi's George Owusu-Afriyie, community education that highlights the urgency of conservation is an important strand of the garden's activities. George describes how Aburi's education section is working with local communities, with a particular emphasis on conservation of medicinal plants.

The growing diversity of the US population and the urgent relevance of natural resource and ecosystem conservation to environmental and social sustainability makes what Jennifer Schwarz Ballard, from Chicago Botanic Garden, believes is an inarguable case for attracting African-American and Hispanic students to natural science careers. Chicago has drawn on its education and research programmes to create a five-year 'Science Career Continuum', designed to strengthen links between programmes and create academic and social support services for underserved students all the way up to graduate programme studies in natural science.

An intriguing approach to social inclusion is outlined by Eva-Lena Larson, from Gothenburg Botanic Garden in Sweden. One of its education programmes is directed at people with stress-related disorders. 'Green Rehab' has helped over 200 sufferers, using a combination of gardening activities, nature walks, body awareness, stress management and art therapy, as well as support groups. Results overall have been encouraging, with a reported 75% of participants returning to work or studies.

entre société et nature ? Quel est leur rôle ? Et comment s'assurent-ils de leur pertinence en tant que moteurs d'apprentissages et d'actions ? Ces questions sont, entre autres, adressées par nos collaborateurs dans ce numéro de Roots.

Jocelyn Dodd et Ceri Jones de l'université de Leicester au Royaume-Uni abordent le sujet de manière directe dans leur article, basé sur les résultats de recherches mandatées par le BGCI. Ils soutiennent le fait qu'à une époque de dissociation grandissante entre l'homme et le monde naturel, alors que les preuves du changement climatique mondial et de l'extinction d'espèces qui en découle sont irréfutables, les jardins botaniques possèdent un immense potentiel en tant que moteurs d'actions sociales et environnementales. Malgré des changements culturels tournés vers une pertinence sociale accrue, les auteurs estiment que les jardins du Royaume-Uni ont pris leur temps jusqu'à présent pour élargir leurs publics et s'investir dans des problématiques communautaires.

Un exemple d'action communautaire pour le développement durable nous vient du jardin botanique d'Aburi au Ghana. Selon George Owusu-Afriyie du jardin d'Aburi, l'éducation communautaire qui souligne l'urgence de la conservation est un axe important parmi les activités du jardin. George décrit comment le département éducatif du jardin d'Aburi travaille avec des communautés locales.

La diversité croissante de la population des Etats-Unis et la pertinente urgence de la conservation des ressources naturelles et des écosystèmes en termes de durabilité environnementale et sociale produisent ce que Jennifer Schwarz Ballard, du jardin botanique de Chicago, considère comme des conditions indiscutables suscitant l'attraction d'étudiants afro-américains et hispaniques dans les formations et professions liées aux sciences naturelles. Le jardin de Chicago a exploité ses programmes éducatifs et de recherche afin de créer un « Continuum des professions liées aux sciences » sur cinq ans, conçu pour renforcer les liens entre les programmes et mettre en place des services de soutien académique et social pour les étudiants défavorisés, s'étendant jusqu'aux programmes de licence en sciences naturelles.

sociedad y la naturaleza? ¿Qué rol deben jugar? ¿Cómo pueden asegurar su pertinencia como agentes de aprendizaje y acción? Estas son algunas de las preguntas planteadas por nuestros colaboradores en esta última edición de Roots.

Jocelyn Dodd y Ceri Jones de la Universidad de Leicester en el Reino Unido hacen frente al tema en su artículo, el cual se basa en una investigación reciente solicitada por BGCI. Los autores argumentan que en esta era de creciente dislocación humana con el mundo natural, cuando la evidencia del cambio climático global y la consecuente extinción de especies es tan irremisible, los jardines botánicos poseen un enorme potencial como agentes de acción social y ambiental. A pesar de su cambio cultural orientado hacia una mayor pertinencia social, los autores encontraron que los jardines del Reino Unido han presentado una cierta lentitud para ampliar su audiencia e involucrarse con las preocupaciones de la comunidad.

Un ejemplo de acción comunitaria para la sustentabilidad lo presenta el Jardín Botánico Aburi en Ghana. De acuerdo a George Owusu Afriyie en el Jardín Botánico de Aburi, la educación comunitaria centrada en destacar la necesidad de la conservación es una de las principales actividades del jardín. George describe cómo el área educativa del jardín está trabajando con comunidades locales.

La creciente diversidad en la población de los Estados Unidos y la pertinente urgencia de una conservación ambiental y socialmente sustentable de los recursos naturales y los ecosistemas, ha hecho lo que Jennifer Schwarz Ballard, del Jardín Botánico de Chicago considera un caso indiscutible para atraer estudiantes afroamericanos e hispanos a las licenciaturas de las ciencias naturales. El Jardín Botánico de Chicago ha elaborado en sus programas de educación e investigación lo que denominan "Carrera continua de ciencia", con una duración de cinco años, diseñada para fortalecer las relaciones entre ambos programas y crear servicios de apoyo académico y social para estudiantes marginados a lo largo de sus estudios universitarios en ciencias naturales.

Addressing cultural or faith diversity is the theme of Mark Bryant's article from Cardiff University in the UK. The university's Centre for the Study of Islam in the UK was commissioned by BGCI to investigate how and whether 'Islamic Gardens' in the UK might contribute to greater British Muslim involvement in biodiversity conservation and sustainability projects (especially in relation to plants). Another strand was the extent to which increased public understanding of Islam and inter-religious dialogue might be achieved. This pioneering research suggested there is scope for botanic gardens to engage with faith based communities by helping them to a greater understanding of conservation, sustainability and biodiversity.

A timely contribution by Sue Surkes from Jerusalem Botanical Gardens describes an initiative to bridge the racial, political and religious chasm that divides the ancient city by bringing Arab and Jewish children together through plant education. Mixed groups of children are encouraged to enjoy hands-on activities. Children also visit each other's schools for planting events.

One exciting illustration of botanic gardens harnessing their collective skills to deliver effective social and educational outcomes is the pan-European INQUIRE project. There is widespread agreement among the European scientific education community that enquiry-based teaching methods are highly effective. On the ground, however, it is a different story and few European classrooms actually implement inquiry-based science education (IBSE). Innsbruck Botanic garden and BGCI are coordinating the INQUIRE project which involves working with 14 botanic gardens and natural history museums (some of Europe's most inspirational cultural and learning institutions) to develop a one-year IBSE teacher-training course for hundreds of teachers – thus potentially benefiting thousands of schoolchildren. An INQUIRE website is currently being developed and we look forward to bringing you updates about the project in the coming months.

**Julia Willison &
David Jeffreys**

Eva-Lena Larson, du jardin botanique de Göteborg en Suède, propose une approche intrigante à l'intégration sociale. L'un de ses programmes éducatifs s'adresse aux personnes présentant des troubles liés au stress. 'Green Rehab' a aidé plus de 200 personnes souffrantes, en associant des activités de jardinage, des sorties nature, la conscientisation du corps, la gestion du stress et l'art-thérapie, ainsi que des groupes d'entraide. Les résultats ont été encourageants dans l'ensemble, relevant 75% de participants qui reprennent le travail ou les études.

L'article de Mark Bryant de l'université de Cardiff au Royaume-Uni traite de la diversité des cultures et des croyances. Le centre d'étude de l'Islam au Royaume-Uni, qui appartient à l'université, a été chargé par le BGCI d'enquêter comment et dans quelle mesure les « Jardins islamiques » au Royaume-Uni pourraient contribuer à une plus grande participation des musulmans britanniques dans la conservation de la biodiversité et les projets de développement durable (notamment en rapport avec les plantes). Ces recherches pionnières proposent qu'il existe une opportunité pour que les jardins botaniques s'investissent auprès de communautés croyantes en leur permettant d'avoir une meilleure compréhension de la conservation, du développement durable et de la biodiversité

Une contribution opportune de Sue Surkes, des jardins botaniques de Jérusalem, décrit une initiative pour combler le fossé racial, politique et religieux qui divise l'ancienne ville, en réunissant des enfants arabes et juifs par le biais de l'éducation liée aux plantes. Des groupes mixtes d'enfants sont encouragés à prendre part à des activités pratiques. Les enfants visitent également les écoles des uns et des autres à l'occasion d'événements de jardinage.

Un exemple passionnant de jardins botaniques qui exploitent leurs compétences collectives afin de proposer des résultats sociaux et éducatifs efficaces se rapporte au projet paneuropéen INQUIRE. Le jardin botanique d'Innsbruck et le BGCI coordonnent le projet INQUIRE (voir la dernière page). Le site Internet est actuellement en construction et nous nous ferons un plaisir de vous tenir au courant des avancées du projet au cours des prochains mois.

Un enfoque interesante de inclusión social lo indica Eva-Lena Larson, del Jardín Botánico de Gotenburgo, Suecia. Uno de sus programas de educación está dirigido a personas con desórdenes relacionados con el stress. "Rehabilitación verde" ha ayudado a más de 200 personas a través de una combinación de actividades de jardinería, caminatas en ambientes naturales, conciencia corporal, manejo del stress, terapia artística y grupos de apoyo. Los resultados son alentadores, ya que han reportado que el 75% de los participantes han retomado su trabajo o sus estudios.

La diversidad cultural o de creencias es el tema abordado en el artículo de Mark Bryant de la Universidad de Cardiff del Reino Unido. BGCI le solicitó al Centro de Estudios del Islam con sede en esta Universidad, una investigación sobre cómo y de qué manera los "Jardines islámicos" en el Reino Unido pueden contribuir a que los musulmanes británicos se involucren en proyectos de conservación de la biodiversidad y sustentabilidad (en particular los relacionados con plantas). Esta investigación pionera sugiere el alcance que pueden tener los jardines botánicos para involucrarse con comunidades muy creyentes para promover en éstas un mayor entendimiento sobre conservación, sustentabilidad y biodiversidad.

Una contribución oportuna de Sue Surkes del Jardín Botánico de Jerusalén describe una iniciativa para tender un puente entre los abismos raciales, políticos y religiosos que dividen a los habitantes de esta antigua ciudad, uniendo a niños árabes y judíos a través de programas educativos con plantas. Se promueven grupos mixtos de niños para que disfruten de actividades prácticas. Asimismo, los niños visitan sus escuelas para eventos de siembra.

Una ilustración emocionante sobre el aprovechamiento de las habilidades colectivas de los jardines botánicos para entregar resultados sociales y educativos efectivos lo constituye el proyecto pan-Europeo INQUIRE (investigación). El Jardín Botánico de Innsbruck y BGCI están coordinando el proyecto (vea la última página). Actualmente está en desarrollo un sitio web y esperamos pronto empezar a brindarles información actualizada sobre el proyecto en los próximos meses.

Towards a new social purpose

The role of botanic gardens in the 21st century

With evidence for global climate change and wholesale species extinction mounting up, the gulf between humankind and the natural world is growing ever wider. Drawing on recent BGCI-commissioned research, Leicester University's **Jocelyn Dodd** and **Ceri Jones** highlight the immense potential in botanic gardens, as agents of social and environmental action, to bridge the divide. It's a slow process, however...

In our modern society people have become increasingly disconnected from plants and the natural world. At the same time, it is impossible to ignore the growing evidence that climate change will have serious implications for human and plant life. Around two-thirds of the world's plant species are threatened by population growth, habitat loss, over-consumption and agricultural expansion. How are we going to tackle the growing social and environmental problems that our world faces? What kind of life do we want now and for future generations?

It is crucial that society engages with these questions. Like many organizations in the cultural sector, botanic gardens are looking to be more socially relevant to meet the urgent challenges of the twenty-first century. How can they best use their resources to address social needs? How should they engage with contemporary issues that will affect the whole of society? These are not easy questions to answer and climate change is a particularly contested issue. But can botanic gardens afford to sit on the fence and do nothing?

As part of the biological and cultural fabric of communities in almost every country and ecosystem around the world, botanic gardens have the potential to reach millions of people. Target 14 of the *Global Strategy for Plant Conservation* requires that everyone should understand the importance of plant diversity and the need for conservation. What better place to get these messages across than a botanic garden?

Yet the evidence from our study suggests that botanic gardens are only taking tentative steps towards developing their social purpose. They reach a narrow section of society, appealing mostly to white, middle-class and older audiences. Humans depend on plants – so it's vitally important that everyone engages with these issues. But how can botanic gardens be relevant to everyone when they are perceived as elitist and exclusive institutions?

Botanic gardens could do much more to engage with their social role and embrace their social and environmental

responsibility. Examining their audiences and contributing to debates on social engagement are vital if they are to reach the widest possible audiences with their message. They have unique resources, wide-ranging collections and staff with a huge amount of expertise. How can botanic gardens reach out to the wider community to demonstrate the contemporary significance of plants in a rapidly changing world? How can they support communities to live ethically and sustainably?



'The Great Day Out' programme run by the Eden Project, UK, provides an opportunity for people from socially excluded groups to see life from a new perspective. (Courtesy of Alex – youlookgorgeous.co.uk)



The Fairchild Challenge, USA, aims to stimulate young people's interest in environmental issues and encourage their active engagement. Here students are participating in intergenerational learning. (Fairchild Tropical Botanic Garden, USA)

Exploring the role and resources of botanic gardens

Between June 2009–June 2010 the Research Centre for Museums and Galleries (RCMG), University of Leicester, was commissioned by Botanic Gardens Conservation International (BGCI), supported by Calouste Gulbenkian Foundation, to carry out research exploring the social role of botanic gardens. With a reputation for quality research and evaluation in the fields of museum learning, education, inclusion and the social role of museums, RCMG's unique set of skills, experience and perspectives were particularly relevant for this exercise. Using mixed methods, RCMG examined, conceptually and practically, questions of social inclusion and social responsibility in botanic gardens. The research offers a way forward, mapping out how they might, as key socially relevant agents, directly engage with the social and environmental challenges of the modern world.

How are gardens working to improve their social contribution?

The research found that botanic gardens are well placed to educate the public on conservation issues and the human role in effecting environmental change. Botanic gardens are beginning to realize the wider contribution they can make to society and are particularly concerned with developing their activities in seven key areas:

- Broadening audiences
- Enhancing relevance to communities
- Education
- Conducting research which has socioeconomic impact locally and globally
- Contributing to public and political debates on the environment
- Modelling sustainable behaviour
- Actively changing attitudes and behaviour

Most botanic gardens are now working to **broaden their audiences** and to lessen the perception that they are only for particular groups. The University of Oxford Botanic Garden (OBG), for example, is one of many working hard to increase their visibility. Amongst other activities, OBG runs a public engagement programme every year – using picnics as the basis for a celebration of plants and the natural world. The emphasis is on family-orientated activities focused around a central theme, such as encouraging people to grow their own vegetables. The idea of a picnic is inclusive and appealing to almost everyone.

Botanic gardens are similarly **enhancing their relevance to communities** and have proved they can have significant impacts on peoples' lives. When Dave (not his real name) was homeless and living in a hostel, the 'Great Day Out' at the Eden Project showed him a way out from the challenging and chaotic circumstances of his everyday life,

introducing him to a new, inspiring and absorbing environment. Taking up the opportunity to volunteer at Eden has helped Dave to turn his life around; now he is living in independent accommodation and looking for a job. Whilst still on his journey, his involvement at the project has obviously given Dave the confidence to take some very positive, and critical, steps forward.

Offsite, botanic gardens can also have an impact. The Botanic Garden Trust, Sydney, works in disadvantaged neighbourhoods to develop communal gardens in disused public spaces. Staff provide horticultural expertise, advice and training, and, in keeping with environmental aims, gardeners follow sustainable and organic gardening practices. These are not short-term projects – it can take up to five years to get gardens going – but the impact on the lives of local people can be profound. Gardens transform derelict spaces and make them productive. Working on the soil brings people together in a collaborative experience, contributing to a sense of community and ownership. It can help to develop individual confidence, skills and vocational opportunities.

Education programmes are well established in botanic gardens. Drawing on their strengths, the learning opportunities provided by gardens frequently involve practical, multi-sensory engagement with plants and sites. But there is considerable variation around the extent to which education is embedded in their respective culture and there is limited evidence of research into learning experiences.

The **research** of botanic gardens has local and global socioeconomic importance and, in developing medicines and hardier crops, can benefit communities directly. Closely linked to this research activity is the contribution they can make to **public and political debates about the environment**. Most gardens share the scientific consensus that global climate change is a real and significant threat. Not only can they provide information about climate change, they can also provide **models for sustainable behaviour** on-site, which show visitors how they might take action and what the impact could be. However, explicit articulation of

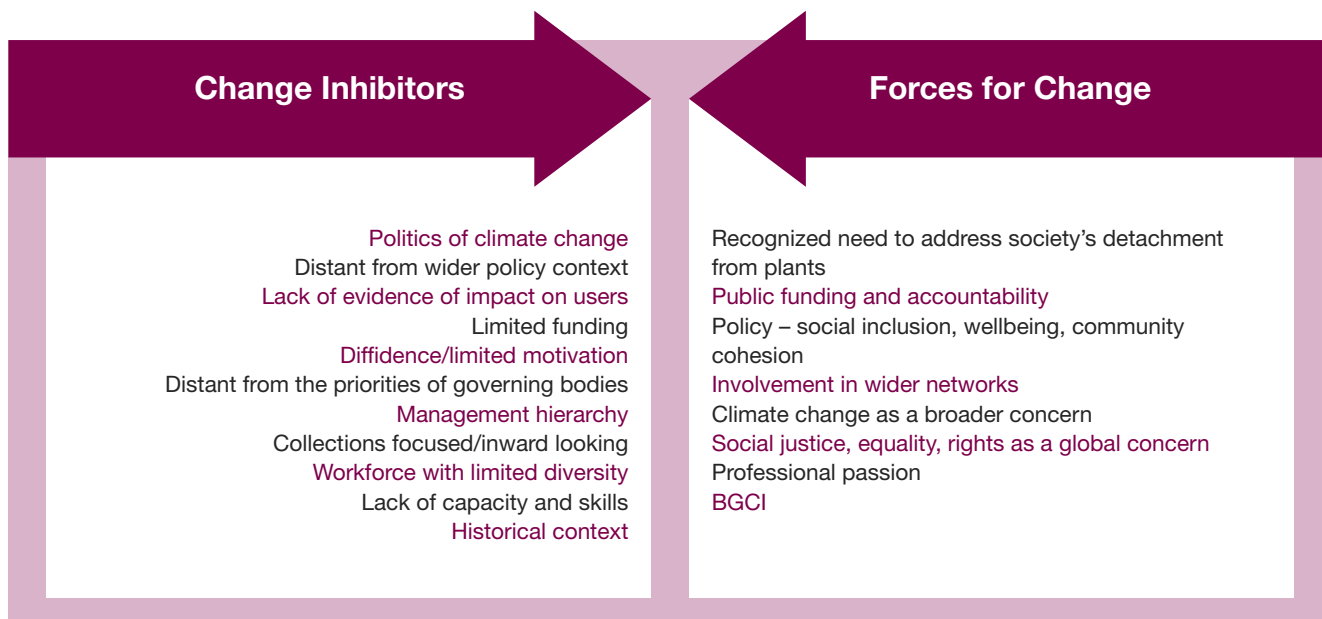


Figure 1: Change inhibitors and forces for change affecting the social role of botanic gardens

environmental values is rarely found. Many botanic gardens do not want to bombard their visitors with messages of 'doom and gloom', or to be seen as partisan or campaigning, which limits the impact that they can have.

Across the sector, botanic gardens are taking action. However they could do much more. Work is often achieved through short-term funded projects. Many are unclear about what their social role really is or could be. Although some gardens may believe they are socially engaged, the evidence to support those beliefs is not always available. Botanic gardens need to be much more proactive if they are to become more socially responsible. This requires an ongoing, in-depth understanding of community need and very clear articulation of the values, social role and responsibilities that the organization wants to have. If they are to be truly accessible, many gardens will need to change.

What stops botanic gardens from being more socially relevant?

If botanic gardens are to genuinely reposition themselves and redefine their social purpose, more integrated action and further evidence is required. At the moment there are a number of **factors inhibiting this change**, but these can be balanced against **forces for change** which motivate gardens to consider their social role in greater depth.

Historically, botanic gardens have rarely examined their social role, the implications of which are still felt in their organizational structures and staff populations today. Gardens are perceived as 'nice' places to work, and the impetus for change can be limited. Many are distanced from the wider national and international policy contexts which can be a catalyst for prioritizing social agendas. The limited evidence available to botanic gardens about their impact on actual and potential users is a serious impediment to developing their social role. Without understanding the impact they have, they are unable to evaluate their work or be able to communicate its value to external audiences and funding bodies.

Reviving the human connection with the natural environment is now largely accepted and there is a growing appreciation of the benefits this will accrue for society. As publicly funded organizations, botanic gardens are also waking up to the reality of greater public accountability and social engagement. The vocabularies of social policy, sustainability and environmental justice are ever more prevalent in the language of government and funding bodies, and the pressure is on for botanic gardens to engage with this discourse if they are to be seen as relevant. The challenge for them, particularly in these uncertain economic times, is to find the evidence to support their funding applications.

Botanic gardens cannot do this work alone. Working in partnership and with key networking organizations will enable gardens to escape isolation and jointly develop new ideas and approaches. But to achieve this, passion is needed. The love of plants is at the core of botanic gardens but a passion for social engagement is less visible and more narrowly focused.

Vital steps to achieve a sustainable social role

What does the socially responsible botanic garden look like? How can they best reposition themselves as dynamic, proactive organizations for the twenty-



Waste-free lunch at Oxford Botanic Garden, UK. Education is embedded across the organization. (Oxford Botanic Garden)



Edith, Trudy and Necia introduce a new resident to the joys of gardening at Leon Lachlan Reserve community garden in the inner Sydney suburb of Rosebery, Australia. (Royal Botanic Garden, Sydney, Australia)

first century, engaging their communities in contemporary issues for a sustainable future?

Repositioning an organization requires a re-evaluation of its mission, values and vision. Botanic gardens first need to ask themselves:

- Why do we exist?
- What do we believe in?
- Who are we for?
- What do we want to achieve?

The answers to these questions need to be clear, targeted, specific and embedded throughout the whole organization.

Imperative to the repositioning of botanic gardens is the combining of their social and environmental roles. Environmental and social justice are global concerns and inextricably connected. It is only by treating them as part of a single problem, and by involving themselves in the key issues, that botanic gardens can really help to combat the 'five tectonic stresses' – population, energy, environment, climate and economics.

In the first steps towards achieving these aims, *Growing the Social Role of Botanic Gardens* is an innovative and experimental project to develop the role of botanic gardens in a socially responsible way. BGCI, in collaboration with RCMG and funded by the Calouste Gulbenkian Foundation, are supporting two UK botanic gardens through workshops and practical projects. Botanic gardens interested in this work should contact BGCI.

With their resources of expertise and knowledge, botanic gardens should be hugely capable of explaining the interconnectedness of people and plants and the potentially devastating consequences of climate change. By working to enhance their social role they can ensure their contemporary relevance across the social spectrum now and for the future.

The full research report, *Redefining the Role of Botanic Gardens: Towards a New Social Purpose*, and summary document, *Towards a New Social Purpose: Redefining the Role of Botanic Gardens*, are available from: <http://www.le.ac.uk/ms/research/rcmgpublicationsandprojects.html>.

RÉSUMÉ

Dans une société où un grand nombre de personnes sont déconnectés du monde naturel, mais où il est prévu que les menaces liées au changement climatique et à l'extinction des espèces s'aggravent, les Jardins botaniques peuvent jouer un rôle important pour permettre aux gens de renouer des relations avec le monde des plantes, les éduquer et leur montrer des modes de vie durables. Contrairement au secteur culturel qui a entamé un virage important vers un plus grand intérêt social, les Jardins botaniques n'ont fait que des pas hésitants pour chercher un élargissement de leur public, et engager des discussions sur les intérêts et les besoins des communautés, alors qu'ils peuvent être également des lieux importants pour aborder les changements sociaux et environnementaux, qui nous concernent tous.

En se basant sur les études du Centre de recherche pour les musées et les galeries (RCMG), à l'Université de Leicester, effectuées pour le compte du BGCI et avec le financement de la Fondation Calouste Gulbenkian – *Redéfinir le rôle des Jardins botaniques : vers une nouvelle résolution sociale (2010)* – est un article qui soulève des questions au sujet du rôle potentiel que les Jardins botaniques peuvent jouer, en relation avec les besoins sociaux et environnementaux. Il analyse les forces du changement ainsi que les difficultés qui bloquent les évolutions dans le

secteur, difficultés qui sont abordées et examinées dans un nouveau projet : *Développer le rôle social des Jardins botaniques*.

RESUMEN

En la educación de una sociedad en donde mucha gente se ha desconectado de la naturaleza, pero donde las amenazas del cambio climático y la extinción de las especies se predicé serán peores, los jardines botánicos juegan un papel importante trabajando en la re-conexión de la gente y el mundo vegetal mostrando modelos para una vida sustentable. En el aspecto cultural a pesar del incremento de acceso a audiencias mas amplias e involucrando preocupaciones y necesidades de las comunidades, los jardines botánicos siguen siendo espacios muy fundamentales para difundir socialmente los cambios ambientales que incumben a las poblaciones del planeta.

Los resultados de las investigaciones del Centro para Museos y Galerías (RCMG) de la Universidad de Leicester, la Conservación Internacional de Jardines Botánicos (BGCI, siglas en ingles), y la fundación Calouste Gulbenkian, redefinen el papel que los Jardines Botánicos hacia un nuevo propósito social (2010). Este artículo hace preguntas sobre el papel potencial que los jardines botánicos juegan en cuanto al medio ambiente y las necesidades sociales. Analizando las fuerzas de cambio, y los temas que lo inhiben, así como aspectos que han sido ya tocados y explorados con el nuevo proyecto de, El papel que desempeñan los Jardines Botánicos en el crecimiento social.

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Promoting education and awareness about plant conservation **the Ghanaian way**

Offering an African perspective on community action for sustainability, **George Owusu Afriye** describes the approach adopted by Aburi Botanic Gardens in Ghana. Aburi's education programme emphasises plant conservation and local communities are being offered cultural incentives to undertake conservation and restoration projects, especially for medicinal plants.

The name *Ghana* means 'warrior king' and was the title accorded to the kings of the medieval West African Empire of Ghana. Located on the Gulf of Guinea, Ghana is only a few degrees north of the Equator, and the Greenwich Meridian passes through the industrial city of Tema. Ghana is cartographically closer to the centre of the world than any other country – though the actual centre (0°, 0°) is located in the Atlantic Ocean approximately 614 km south of Accra, the capital city. With an area of 238,540 km² and a population of 21,110,000 (in 2007), the country's major exports are gold, cocoa, timber, tuna, bauxite, aluminium, manganese ore and diamonds. In Ghana, forest covers about one third of the country and the primary forest provides a basic indicator of biodiversity.

Importance of Ghana's biodiversity

The Ghanaian forest harbours enormous biodiversity, which is critical for the maintenance of natural resource productivity and vital for supporting livelihoods. Furthermore, the forest is home to numerous animals, birds, butterflies and important tree and plant species (for example, *Khaya senegalensis*, *Vocanga Africana*, *Paullinia pinnata*, *Piper nigrum*) that provide sustainable medicinal resources, maintain the ecosystem and serve as a bank of biodiversity.

The main objective of Aburi Botanic Gardens is the conservation of indigenous plants especially medicinal plants. (Aburi Botanic Gardens)





A magnificent avenue of Royal Palms planted in 1895 line the entrance to the gardens. (Aburi Botanic Gardens)

Stakeholder groups

A careful look at the stakeholder groups in biodiversity arrangements for Ghana uncovers a large agglomeration of government ministries, departments and agencies, non-governmental organizations, the private sector, the UN Agencies and other development partners. The concept of stakeholders is taken in its broadest sense and includes all groups whose activities directly or indirectly have a positive or negative effect on biodiversity.

Aburi Botanic Gardens

Aburi Botanic Gardens is one of the foremost Institutions of State playing a key role in promoting conservation and supporting education for sustainable development.

The Garden is situated on the Akwapi Ridge, 38 km north-east of Accra, the national capital. It overlooks the Coastal Plain at an elevation of 1200–1500 ft (365–457 m) above sea level and covers an area of 160 acres (64.7 hectares). The Garden was officially opened to the public in March 1890 and at that time covered an

area of 20 acres (8 hectares), developed around a sanatorium built by the British in 1875 for convalescent government officials. The first curator of the Garden (1890–95) was William Crowther, a student from Kew Gardens. At that time, the Garden contained primary forest and a few introduced ornamental plants. (The only survivor of that original forest, a *Ceiba pentandra*, or Kapok tree, is about 350 years old and stands majestically in front of the sanatorium.)

At the time of establishment, the Garden had the following main objectives:

- a) The experimental planting of both economically valuable and decorative plants from other tropical and sub-tropical countries with a view to finding those which could thrive under local conditions;
- b) The exhaustive exploration of the agricultural resources of the country, with a view to finding suitable economic plants for European markets; and
- c) The teaching of scientific methods of agriculture.

Now, 120 years on, the main objective of Aburi Botanic Gardens is the conservation of indigenous plants especially medicinal ones. To this purpose, the garden's activities involve conservation, horticultural training and education. Today, Aburi is one of over 2,000 botanic gardens worldwide leading the fight to save plant diversity. It has established a 50 acre (20.2 hectares) farm as a resource centre for training and distribution of medicinal plant seedlings to herbalists, schools and NGOs and strives to create understanding and awareness of the methods of conservation and development of plant resources.

Education at Aburi

The aim of the Education Programme at Aburi is to ensure that all sections of the population within the community, especially school children, religious groups, farmers, herbalists and social clubs, understand environmental systems and processes for biodiversity conservation and sustainable living.

The Education Unit at the Garden is run by one fully trained and permanent member of staff, who is occasionally

assisted by volunteers. The Garden is visited by 65,000 visitors on average, each year and the education programme is designed to include lectures, guided tours, plant identification, leaflets and posters. All elements of the programme have a plant-based focus. Aburi also runs outreach programmes for communities within a radius of 20 km from the Garden.

Surveys are carried out to select the most appropriate communities to work with. The surveys look at the impact the communities have on their environment, the number of medicinal plants in the area and threatened species. The selected communities are offered assistance to undertake restoration programmes, which are generally carried out on nearby areas that are degraded due to bushfires, unsustainable agricultural practices and the over harvesting of medicinal plants, etc. There is a real need to restore these areas for environmental quality and to protect lives and property during storms. In communities with a large number of herbal practitioners, medicinal herbs are commonly planted. For example, Konkonuro, a community about 10 km from Aburi was assisted in setting up a community medicinal herb farm on a degraded area in the outskirts of the community. This community specializes in the setting of broken bones after motor accidents and the removal of bullets from gunshot wounds which often occur during night hunting expeditions. This occurs because farmers and hunters wear strong lights on their foreheads to help them identify animals by the reflection of their eyes. Unfortunately this also increases the risk of mistaking fellow hunters for game. Aburi has also developed a First Aid Garden to encourage herbalists to establish backyard herbal gardens that include threatened species, with the aim of helping to reduce pressure on wild plants. The slogan used during the outreach programmes is 'THE FOREST IS YOUR PHARMACY, USE IT WISELY'.

Other initiatives include the use of festivals and songs for education programmes. Currently through collaboration between a private company, ZOIL Services Limited (a subsidiary of Zoomlion Ghana Limited), and the Forestry Commission, an environmental song entitled 'Plant a tree

today' has been produced on CD-ROMS and cassettes. The Director of Aburi Botanic Gardens provided the words for a local artiste to produce the song while ZOIL Services Limited funded the project. Hundreds of copies have been distributed free of charge.

Another major education programme in which Aburi participated was the launching and setting up of the Regional Centre of Expertise (RCE) in Ghana by the United Nations University. The programme was launched by Prof. Dr Hans Van Ginkel, United Nations Under-Secretary General and Rector, United Nations University, Tokyo. RCE is a network of Institutions of formal and non-formal education which are mobilized to deliver Education for Sustainable Development (ESD). The goal of RCE Ghana is to become a centre of expertise in the area of sustainability in Africa, through enhancing public awareness and understanding of Sustainable Development (SD) and ESD and generation of innovative programmes in the areas of learning and research. RCE Ghana Institutions include Aburi Botanic Gardens, Kwame Nkrumah University of Science and Technology, Ghana Chamber of Mines, Forestry Commission, Kumasi Zoo, Friends of Rivers and Water Bodies, Anglogold, Environmental Protection Agency, University of Education.

Growing participation from schools

Aburi's participation in the RCE Ghana and the publicising of the programme through the electronic and print media has impacted positively on its education programme. For example, in 2007 we had 4,650 schoolchildren from 50



Outreach education programmes are run for communities within a 20km radius of the botanic garden. (Aburi Botanic Gardens)

schools visiting the Garden. This rose to 7,350 from 187 schools in 2008 and in 2009 we had a total of 10,200 school children from 203 schools visiting Aburi.

Based on the monitoring and evaluation report on the performance of the Education Unit of the Garden, Aburi intends in the future to develop an even wider schools/communities participation in education programmes, through the institution of awards and competitions for efforts made in environmental and plant conservation.

RÉSUMÉ

Le jardin botanique d'Aburi, au Ghana, occupe une surface de 65 hectares, à une courte distance de la capitale, Accra. La forêt primaire recouvre environ un tiers de cette surface et joue un rôle de référence important pour la biodiversité locale. Les activités du jardin sont centrées sur trois domaines principaux :

- l'éducation aux communautés, pour leur faire prendre conscience de l'importance de conserver la forêt primaire.
- l'identification des plantes locales ayant un potentiel économique en Europe.
- l'enseignement de méthodes scientifiques en agriculture.

Le service éducatif d'Aburi travaille avec les communautés locales pour entreprendre des projets de restauration, en insistant en particulier sur le besoin de conserver les plantes médicinales. Des festivals et des chansons sont utilisés, avec le soutien des industries locales, pour inciter une plus large participation des écoles et des communautés. Un « Centre régional d'expertise » des Nations unies se trouve à Kumasi et est

en lien avec d'autres CRE dans le monde entier afin de valoriser la sensibilisation et la compréhension de l'Education au développement durable. Le CRE-Ghana a permis de mettre en relation le jardin botanique avec les universités, les agences environnementales et les industries pour initier des programmes efficaces en faveur du développement durable.

RESUMEN

El Jardín Botánico de Aburi en Ghana tiene 160 acres de superficie; se encuentra a una distancia muy corta de la capital Accra. La vegetación en el área es un bosque prístino y éste ocupa un tercio del área total, de tal manera que representa un lugar clave para biodiversidad local. Las actividades del jardín se enfocan principalmente en:

- Educación comunitaria, promoviendo el entendimiento de la urgencia y necesidad de la conservación.
- Identificación de las plantas locales con uso potencial económico en Europa.
- Enseñando agricultura con métodos científicos.

La sección educativa en Aburi trabaja con las poblaciones del área emprendiendo proyectos de restauración con énfasis en la necesidad de conservar plantas medicinales. Las industrias locales apoyan festivales, incluyendo musicales, para animar a un rango amplio de escuelas y su participación en la comunidad. En Kumasi existe un centro regional de expertos de las Naciones Unidas (UN) y establece redes de comunicación con otro del Centro Regional de Experticia (CRE) que actúa a nivel mundial para mejorar la concienciación y entendimiento del desarrollo de una educación sustentable. CRE – Ghana junto con universidades han traído al jardín botánico agencias del medio ambiente e industrias para inicial programas efectivos de desarrollo sustentable.

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The education programme aims to ensure that all sectors of the community understand the importance of environmental systems. (Aburi Botanic Gardens)

A pathway to change

environmental science career training for youth

As environmental sustainability becomes increasingly important to global, political, economic, and social stability, botanic gardens have both the opportunity and the obligation to take a leading role, not only in natural resource/ecosystem conservation, but also in environmental education that fosters social sustainability through inclusion. Our current environmental crises require a new generation of interdisciplinary scientists well versed in fields such as ecology, reproductive biology, biogeochemistry, hydrology, and climatology – yet these careers draw the fewest graduate students overall, particularly from among African Americans and Hispanics (Czujko, 2004). The increasingly diverse population of the US makes this of particular concern to botanic gardens, since their attendance is more representational of the demographics of the country than traditional museum audiences. By providing compelling informal science experiences that inspire students and transform academic knowledge into passion for the environment, gardens can play a critical role in creating a sustainable global community.

US educational and social contexts

Attracting young African Americans and Hispanics to plant science is especially important as the demographics of the US change and the demand for plant science research escalates. According to the 2000 US Census, the number of people who identify themselves as African American increased by almost 16 per cent and as Hispanic by almost 60 per cent between 1990 and 2000. Under-resourced, urban public schools present a challenging academic climate for students and

Despite an increasingly diverse US population, African-American and Hispanic students are still under-represented in natural science careers. **Jennifer Schwarz Ballard** outlines Chicago Botanic Garden's ambitious mentoring scheme in science education for secondary school students from disadvantaged backgrounds.

teachers. The City of Chicago, which the Chicago Botanic Garden serves, is a case in point. On average, Chicago Public School (CPS) students perform lower in science on state and national tests than their suburban and rural counterparts and also score among the lowest of 11 major US urban areas. Among all CPS students, 35 per cent score below the basic achievement level in science, rising to 70 per cent for Hispanic students and 81 per cent for African-American students, a further decline from 2005 performance levels (data from National Assessment of Educational Progress, 2011). A 2005 report states that only 8 per cent of CPS graduates attained a four-year college degree by their mid-twenties, dropping even lower for African-American and Hispanic males (Allensworth, 2005). The challenges these students face in elementary science leaves few eligible for university recruitment programmes and scholarship opportunities.

Case study: The science career continuum

The Chicago Botanic Garden's five-year Science Career Continuum (SCC) is a pilot initiative designed to strengthen connections between Garden

programmes and to create academic and social support services for underserved CPS students in their middle school, high school, undergraduate and graduate studies in natural science. The framework for the SCC is formed by CBG's existing, successful programmes for underserved African-American and Hispanic teens, as well as its higher education programmes. Individually these programmes provide stepping stones towards science careers, but without any 'mortar' – programmatic connections and support networks – the path is difficult to follow.

Teen programmes

The Chicago Botanic Garden provides five years of programming for teens in grades 8 through 12 (ages 14–18). CBG launched its first programme, College First, in 1994 to engage Chicago 11th and 12th graders in environmental science and facilitate college acceptance. This year-round programme begins with an eight-week, paid summer internship. Students spend mornings working with CBG staff mentors in horticulture, conservation science, and education. Afternoon studies and field research focus on advanced concepts in environmental science and ecology. The summer culminates in a research project

that integrates students' internship experiences with knowledge gained in the classroom. At monthly meetings during the school year, College First students explore the college application process and visit area colleges.

From its inception, College First has been continually evolving. In its early years, students appreciated the summer job opportunity and college preparation activities, but few expressed interest in science. Subsequently, CBG developed Science First in 2002. This four-week intensive programme is offered twice each summer, to a total of 40 students in grades 8–10 annually. Targeting a younger age-group with a hands-on curriculum that uses the entire Garden as a classroom, CBG excites these middle school students at a critical time in their education, when interest in school and in science typically wanes. After grade 10, Science First students are encouraged to continue participation through College First.

Higher education programmes

As CBG education staff developed teen programmes, CBG scientists expanded higher education opportunities, including summer internships for undergraduates and graduates and, most recently, Master's and PhD programmes in Plant Biology and Conservation. CBG's Research Experiences for Undergraduates in Plant Conservation, funded by the National Science Foundation, provides college interns from schools across the US with rich research experiences and access to world-class facilities. Annually since 2004, eight undergraduate interns have spent the summer studying integrated conservation, restoration, and management of human-altered landscapes. Opportunities continue with the Conservation and Land Management Internships, supported by the Bureau of Land Management. Recent college graduates receive mentoring, training, and hands-on experiences in the fields of conservation and natural resource management. Five- and ten-month assignments with mentors from the Bureau of Land Management, US Forest Service, and National Park Service teach valuable skills and conservation experience as they explore environmental career opportunities. The Masters and Doctorate in Plant Biology and Conservation are collaborative



College First students identify fresh water macroinvertebrates. (Chicago Botanic Garden)

programmes between Northwestern University in Evanston, IL and CBG. Students take courses and conduct research with faculty and scientists from both institutions, gaining experience in both academic and applied conservation research. While a goal of all these programmes is to engage students from under-represented groups in science careers, finding interested and qualified participants has been challenging.

The CBG pathway to social inclusion

While CBG programmes are successful individually, we do not currently see College First graduates participating in the Garden's higher education programmes, despite expressed interest in science and qualifying academic performance. Simply facilitating academic achievement is not sufficient to overcome the social, cultural, and political structures that limit diversity in the scientific disciplines. The Science Career Continuum seeks to do more than provide academic enrichment. It incorporates programme components, identified by education and diversity research, that support students from under-represented groups in successfully

following the path from middle school, through the graduate experience, to careers in natural science.

Creating a community of practice

To successfully address global environmental challenges, botanic gardens must engage diverse populations to understand and act on what have been called the 'five tectonic stresses' – population, energy, environment, climate and economics (BGCI, 2010). This only becomes possible when young people are prepared for action through meaningful, ongoing participation in the larger social and political community. Thus, a critical component of the Science Career Continuum is the establishment of a scientific community of practice (Lave and Wenger, 1991) into which teens are welcomed as respected apprentices, encouraged in their scientific endeavors, and supported by experienced mentors throughout their high school, undergraduate and graduate experiences.

Participation in this community begins with multi-directional mentoring relationships. New Science First students learn content and community norms and



Sophia Siskel, President and CEO of the Chicago Botanic Garden and a Science First participant, address Illinois government officials to explain the importance of the Garden's teen programmes. (Chicago Botanic Garden)

practices from returning students, while College First students act as mentors for the older Science First students. During the summer, Research Experiences for Undergraduates (REU) interns act as College First mentors and role models for both Science First and College First students. REU interns provide an essential link between the teens and their professional mentors. Only a few years older than the College First students, REU interns are approachable and provide the latest information and guidance for aspiring teens. Conservation and Land Management (CLM) internships take place off site, so Science First and College First students learn about these field-based experiences through video conferencing. Mentoring relationships continue through the school year, supported by social networking sites that provide opportunities to share college and career resources and a way to stay connected with students from College First who have entered college.

By formalizing inclusion in the Botanic Garden's scientific community of practice, CBG hopes to better engage young people in a collaborative, socially, and environmentally important joint enterprise. The bond should be formed through a shared repertoire of routines, sensibilities, artifacts and vocabulary developed over time. Inculcation of students into this practice lays the groundwork for individual success and social change – ideally resulting in the inclusion of diverse populations in environmental science.

Supporting academic interest and achievement

The Science Career Continuum leverages the ability of botanic gardens to provide immersive and inspirational experiences with nature that can transform detached knowledge into a passion for science. Students begin College First with an in situ research experience. From summer 2011, each new cohort will spend three to

five days at a collaborating organization (e.g. University of Michigan Biological Station) working with scientists on their research. In this way the programme makes academic pursuits real through experiential learning and long-term exposure to, and participation in, science and research-based communities. The experience is designed to excite students with fieldwork, introduce them to careers in the biological sciences, and provide a shared experience to help strengthen community bonds.

Academic support does not end with high school graduation, but continues throughout the student's undergraduate and graduate experiences. Social networking and on-line resources allow ongoing support for students as they begin college. Facebook sites include a discussion area, individual groups for each cohort, and a resource area. Current students can ask questions of older students and learn from their experiences. Students in college can report on their school progress, ask questions about adjusting to college, and discuss career options and the courses required for them. As the depth of the website grows, it is likely to become a career resource for students, further strengthening community bonds. Once students begin college, they are eligible for Garden-dedicated spaces in the REU and CLM internship programmes and for scholarships for Plant Biology and Conservation graduate programmes. This steady communication with students supports their continued interest in and pursuit of natural science careers.

Parent support and education

The Garden must attend not only to the needs of our students, but also those of the communities from which they come. The continuum engages caregivers on two levels – personal and educational. Teens attend programmes for as long as five years, which allows students and their families to forge personal bonds with summer instructors and Garden staff. Families are invited to attend the Science First and College First presentations of their culminating research project, as well as a holiday gathering in January.

Because most students who participate in Science and College First will be the first in their family to go to college,

parents are unprepared to guide their children through complex college application and financial processes (Smith, 2001; 2009). Research suggests that African-American and Latino parents with limited education demonstrate a high level of concern about their children's academic achievement, but their ability to support their children in preparing for college is constrained by their life situations and knowledge of higher education options (Delgado-Gaitan, 1994; Smith, 2001). Consequently, a parental education component is integral to the success of the Continuum. The University of Illinois Extension, Early College Outreach Program, is providing workshops for SCC student parents that cover the importance of higher education and how to negotiate the process, filling out college applications, and applying for financial aid. Workshops in English and Spanish are scheduled for evenings and weekends in a variety of locations around Chicago, to ensure that working parents are able to attend.

Conclusion

The Science Career Continuum is one example of a programme that enables botanic gardens to be leaders of social and environmental education. By integrating social, academic and community support, the SCC can do more than provide academic enrichment. It can be a demonstration project, informing the future role of botanic gardens in providing underserved youth with the resources to overcome social, cultural, and political structures that limit diversity in the scientific disciplines.

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RÉSUMÉ

La diversité croissante dans la population des Etats-unis, et l'importance accrue de la conservation des ressources naturelles et des écosystèmes, pour un développement environnemental et social durable, sont des arguments irréfutables pour attirer les étudiants afro-américains et hispaniques vers des carrières en sciences naturelles. En dépit des programmes de recrutements universitaires et des opportunités de

bourses, les résultats, souvent insuffisants, de ces élèves en sciences à l'école primaire sont l'une des difficultés. Les Jardins botaniques jouent un rôle crucial en s'attaquant à ce défi, grâce à leur capacité à fournir des expériences informelles motivantes, qui peuvent transformer le savoir des étudiants en passion pour l'environnement.

Le jardin botanique de Chicago s'est appuyé sur ses programmes éducatifs et de recherche pour créer un "continuum en carrières scientifiques" sur cinq ans, qui renforce les liens entre les programmes, et qui permet de mettre en place des services académiques et sociaux pour les étudiants défavorisés au collège, au lycée, à l'université et jusqu'au programme d'étude pour les licences en sciences naturelles. Individuellement, ces programmes constituent les premières marches vers une carrière scientifique, mais sans le ciment (les connexions entre programmes et les réseaux d'aide), le chemin est difficile à suivre. Ciblée, cette formation aux carrières en sciences environnementales, avec un soutien pour les jeunes des minorités, demande des investissements en programmes de haute qualité et une aide intensive pour les étudiants tout au long de périodes de transitions stimulantes, mais c'est un outil puissant pour construire un contexte favorable à une intégration sociale qui est la marque d'une société performante.

RESUMEN

La creciente diversidad de la población de los EE.UU. y la importancia de la conservación y sostenibilidad de los recursos naturales, son un reto para atraer estudiantes africano americanos e hispánicos inarticulados a las carreras de ciencias naturales. A pesar de los programas de reclutamiento por medio de becas universitarias, ellos se encuentran consistentemente aislados en la representación de los programas de ciencia básica. En este contexto los jardines botánicos pueden señalar y dirigir este cambio compilando información de experiencias científicas que pueden transformar el conocimiento y pasión de los estudiantes por el medio ambiente. El jardín botánico de Chicago ha propuesto el crear un currículo de cinco años en sus programas de educación e investigación 'Science Career Continuum'; el que estresa y forma académicamente la



College First student take aquatic plant samples from the Skokie River in Illinois.

conexión con servicios y apoyo social para dichos estudiantes que se encuentran en educación media, alta, no graduada y graduados en el área de las ciencias naturales. El currículo consiste en programas individuales, en los que paso a paso el estudiante se involucra hacia las carreras científicas, pero sin la pesadez o bombardeo de temas que éstas carreras comúnmente exigen; por medio de conexiones programadas y redes de apoyo, el sendero es difícil de seguir, pero posible. Enfocar continuamente un entrenamiento de una carrera científica para una juventud minoritaria requiere de una calidad muy alta, inversiones y apoyo intensivo para estudiantes que se enfrentan y cruzan estos periodos de transición; este sendero es una herramienta poderosa para llevar a cabo este tipo de incorporación que será el sello para una sociedad con éxito.

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Nature based therapy – an ideal role for a botanical garden?



Programmes offered through the Green Rehab Garden help alleviate stress, depression and anxiety. (Gothenburg Botanical Garden)

Stress-related disorders are commonplace these days, symptomatic perhaps of our dislocation from the natural rhythms of life. Gothenburg Botanical Garden's 'Green Rehab' education programme, incorporating a range of gardening activities, exercise, stress management and other strategies, has been well received, as **Eva-Lena Larson** reports.

Everyone experiences stress now and then and many people around the world are now using gardening or nature walks as a means of relaxation. New research shows that nature helps us to reduce stress and to handle depression and anxiety. So how does the Gothenburg Botanical Garden fit into the picture – why is this important or interesting for us?

A botanical garden has many roles. It displays plants from far and near and creates possibilities for research, plant conservation and biodiversity. It offers an arena for public outreach and education on different levels. But a botanical garden is also a refuge for city people. A pleasant, undemanding place where you do not have the responsibility to mow the lawn or pull up weeds. A place to just relax and recharge.



Nursing seedlings at Green Rehab, Gothenburg Botanical Garden, Sweden. (Gothenburg Botanical Garden)



Springtime in Gothenburg Botanical Garden. (Gothenburg Botanical Garden)

In the year 2000, the Gothenburg Botanical Garden (GBS) started a new project with the aim of gaining and disseminating knowledge on the connection between nature, gardening, health and lifestyle. During the following six years a collaboration between the garden and the University of Gothenburg took place. It resulted in several popular booklets on the subject and many lectures were held all over Sweden. In 2006, as a result of a regional political decision, GBS was asked to develop a rehabilitation programme for people with stress-related disorders. The Garden was happy to accept this opportunity to put theory into practice and Green Rehab, as the programme was named, opened that same year.

Success of Green Rehab

Today, in early 2011, Green Rehab has been running for almost five years. Initially intended to be a three-year project, in 2009 the region decided that it would become a permanent part of the Garden. A team of five people, consisting of a biologist, a gardener, a psychotherapist, a physiotherapist and an occupational therapist, is working with the patients on a daily basis. Fifty patients a year can attend one of the four present programmes, with a group size of eight. **So far, a total of 200 participants have benefitted from participating in the programmes.**

If you have been on sick leave for a long time, it is not so easy to restart. Our patients have been away from work on average for 3.5 years. Green Rehab may be described as a transit centre, a place

between home and work. Here you are given tools to handle the stress in your life, and you can take the first steps towards a new or a resumed career. The Green Rehab team supports participants through the sometimes difficult journey back to an active life. The method is successful – about 75 per cent of the patients return to work and studies after completing the programme.

There is also a programme for people who are at risk of developing stress-related illnesses. If we can prevent them from getting sick in the first place, a lot of pain and trouble will be avoided. To help these patients, a variety of methods are used. Gardening and walks in the forest close by are highly effective. Other activities include relaxation exercises, body awareness, talking sessions and handicrafts. Unfortunately there is no magic wand at Green Rehab – patients will have to do the work by themselves, but the team will always support them.

Seven stops on the path of health

There is a strong educational element in Green Rehab and therefore it does form part of the educational programme at the Gothenburg Botanical Garden. The key message to everyone is that research results show that stress can be treated using gardens and nature. The first piece of advice is to take good care of yourself, so that you do not develop a stress-related disorder – it is easier to stop the breakdown than to climb back up the ladder after the illness. The Green Rehab programme is manifested in many ways in the public outreach

activities of the GBG. In 2010, The Year of Health was celebrated and a small Garden of Health was erected in the entrance area. There is also web-based information and a guide to the new Path of Health can be downloaded to a mobile phone or as a mp3-file. Along this path you pass through seven stops. At each stop a piece of useful information on how nature and health are connected is presented, and you can also take part in a relaxation exercise. There is also a **guide to specially selected Peaceful Places in the Garden.** (In Sweden a new book has been published about the method used in Green Rehab.)



A botanic garden can be a refuge for city people – a place to just relax and recharge. (Gothenburg Botanical Garden)

The GBG was recently host for a conference on the subject. Several well known researchers, both national and international, presented their work to an enthusiastic audience of over 325 participants. The Green Rehab team members frequently give lectures, both at university level and in public. There is a huge interest since psychosocial illness is increasing through the whole Western world. Gardening and nature are potential remedies – ones we should all consider using.

Gothenburg Botanical Garden, Sweden

- In total 175 hectares (ca 430 acres), of which most constitutes a nature reserve including the arboretum. The garden proper is about 40 hectares and here you can find 12,000 different species and cultivars.
- The Rock Garden is famous and has received three stars in the *Michelin Guide*. Other fascinating parts of the garden are The Rhododendron Valley and The Japanese Glade.
- The Greenhouses hold about 4,000 of various species and cultivars, including some 1,500 orchids.
- The educational programme receives 5,000 schoolchildren every year.
- The garden is open every day, all year round, from 9 am until sunset.

patients présentant des troubles liés au stress (épuisement professionnel). Plus de 200 patients y ont participé au cours de ces années. Les supports utilisés sont le jardinage, les sorties nature, la conscientisation du corps et l'art-thérapie, ainsi que la participation à des groupes d'entraide. Le bilan est positif, avec 75% des participants qui reprennent le travail ou les études. Green Rehab propose également des cours sur la gestion du stress.

Le Jardin botanique de Göteborg développe ses nouveaux objectifs liés à la nature, le jardinage, la santé et le mode de vie depuis 10 ans. Les informations à ce sujet sont communiquées aux visiteurs à travers un panel d'activités. Par exemple, un guide intitulé "Le chemin de la santé" a été publié, incluant une sélection de *Lieux paisibles* dans le jardin. L'année dernière, un petit jardin d'exposition intitulé "Le jardin de la santé" accueillait les visiteurs à l'entrée principale. Une conférence s'est tenue sur ce thème en août 2010.

RESUMEN

Una de las funciones de un jardín botánico es el ser un lugar para relajamiento y recarga de energía. El jardín botánico de Gothenburg en Suecia, en este propósito, tiene el programa "rehabilitación verde" [Green Rehab]. Este se ha llevado a cabo por casi cinco años y es orientado a



Patients entering the Green Rehab programme have been out of work on average 3.5 years. (Gothenburg Botanical Garden)

pacientes que sufren de agotamiento por estrés. Durante este tiempo se ha tratado mas de 200 pacientes. Las herramientas usadas en esta terapia son: jardinería, caminatas, enfoque corporal y actividades de arte, asimismo como la participación en grupos de apoyo. El 75 % de los participantes han regresado exitosamente a su trabajo o estudios. "Rehabilitación verde" contiene también cursos por separado de manejo de estrés.

El jardín botánico de Gothenburg lleva desarrollado este nuevo enfoque en jardinería, salud y estilo de vida por 10 años. La información del mismo se comunica a los visitantes a través de un rango amplio de actividades. En ellas tenemos la publicación de "camino a la salud" (*Path of Health*), que es una guía de lugares localizados en el jardín que se les llama 'lugares de paz' (*Peaceful Places*) y una pequeña exposición a la entrada del jardín con el título de 'El jardín de la salud' (*The Garden of Health*) a manera bienvenida para los visitantes. En agosto del 2010 se llevo a cabo exitosamente una conferencia con este tema.

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To date 200 participants have benefitted from participating in Green Rehab. (Gothenburg Botanical Garden)

Engaging **British Muslims** in environmental issues

Pioneering research by Cardiff University, on behalf of BGCI, suggests that botanic gardens can develop meaningful relationships with faith-based communities in order to foster greater understanding of conservation, sustainability and bio-diversity. Apathy is an issue, concedes **Mark Bryant**, but the potential rewards are great.

While working with 'Qur'anic garden' projects in the Middle East, Botanic Gardens Conservation International (BGCI) saw the opportunity to link traditional Islamic respect for natural habitats inspired by the Holy Qur'an, with the goal of conservation of plant diversity. Thus inspired, BGCI began to work out how the concept of a Qur'anic Garden could be adapted and developed outside the Arabian Peninsula – in particular in the UK. Having secured funding from the Calouste Gulbenkian Foundation, BGCI then approached the Centre for the Study of Islam in the UK. The centre, based at Cardiff University, is recognized for its high quality research and focuses on contemporary issues facing Muslims living in Britain. An eight-month project was commissioned, to examine whether and how the building of gardens reflecting Islamic traditions could promote biodiversity conservation awareness, and an appreciation of Islamic gardening heritage among both Muslims and non-Muslims. It was hoped that opportunities would be identified both for increasing the involvement of

Muslims in local environmental issues and also for promoting greater respect and understanding from the local community for Islamic heritage and plants. Other potential benefits include educational opportunities and the encouragement of social integration of Muslim women in society.

An important aspect of the research was to gauge the current level of involvement of botanic gardens in these issues and, if possible, to find ways of working with faith-based communities that could help such gardens to widen their appeal and work proactively within their local communities.

Early in the project, we made a collective and strategic decision to change the conceptualisation of the project, so that our focus was not so much on 'Qur'anic Gardens', but on 'Islamic Gardens'. The substantial concern we had was that the concept of a 'Qur'anic Garden' could be rather restrictive, especially if narrowly interpreted. Also, an early literature search revealed the absence of an established body of writing on the theme

of 'Qur'anic Gardens', whereas we found an abundant literature about the idea of Islamic gardens and Islamic conservation.

British Muslims

Present estimates put the number of Muslims living in the UK as around 2.4 million (Kerbaj, 2009). Having said this the 'British Muslims' represent a religious community that is linguistically, spiritually, ethnically, and racially very diverse (Gilliat-Ray, 2010). For this reason it is probably more useful to talk about Muslim communities as a whole, rather than to think in terms of a single community. Overall, views on religious attitudes to environmental issues and Islamic heritage are likely to reflect this diversity. Muslims have been living and working in the UK for centuries (Ansari, 2004; Matar, 1997). However, the arrival into Britain of substantial numbers of predominantly South Asian Muslims following the Second World War,



Visitors to the Mughal Garden, Lister Park, Bradford appear to have little awareness of the significance of this garden. (Kind permission of City of Bradford Metropolitan District Council)



The Alhambra Garden in Roundhay Park, Leeds, is culturally significant for Muslims. However, Muslims appear to prefer attractions such as 'tropical world' as they offer activities aimed at families. (Helen Falconer)

changed both the quantitative and qualitative nature of Muslim settlement. Migration history accounts for the socio-demographic and economic situation of British Muslims today. About half of all Britain's 2.5 million Muslims are under the age of twenty-five and, compared to all other faith groups, Muslims are more likely to be living in areas of housing deprivation and to suffer from lower rates of economic activity, educational achievement and good health (Hussain, 2008). The general picture that emerged from the 2001 Census data revealed that British Muslims suffer from a range of cumulatively disadvantaging socioeconomic circumstances to a greater extent than all other faith groups in the UK (Beckford et al., 2006). It follows, then, that the socioeconomic situation of the majority of Muslims living in the UK will colour their attitudes to issues such as the environment and how they would feel about visiting places such as botanic gardens.

Islamic environmentalism

For Muslims, the ultimate source of guidance on all ethical questions, including the principle of environmental responsibility, is the Qur'an, which

directly addresses and anticipates the tendency that humans have for environmental irresponsibility, as well as highlighting the imperative to take care of the earth's resources.

Corruption has flourished on land and sea as a result of people's actions and He will make them taste the consequences of some of their own actions so that they may turn back. (Surah 30:41)

Further important sources for Muslims are the sayings of the prophet Mohammad (*Hadith*) and here too is guidance. For example, he is reported to have said

Whoever plants a tree and looks after it with care until it matures and becomes productive, will be rewarded in the hereafter. (Ammar, 2001)

Respect for the environment is also found in central tenets of Islam: for example, *tawhid* expresses the unity of an uncreated God with what he has created. According to Muslims, people can only really experience God through his creation. Therefore, nature is respected as part of God's creation and

as a sign of his greatness and, indeed, existence. As well as respecting nature as part of creation, Muslims have also been entrusted with the task of acting as *khalifah*, or vice-regents on earth.

Later We made you their successors in the land, to see how you would behave. (Surah 10:14)

As the global environmental crisis deepens, concerned Muslims in Britain are turning towards principles of conservation and environmental awareness embedded in Islamic sources to encourage their fellow Muslims to behave in an environmentally responsible way. The research identified five regional Islamic environmental groups operating in Britain (Reading, London, Sheffield, Wales, and Birmingham, West Midlands) and one national body, the Islamic Foundation for Ecology and Environmental Sciences (IFEES), also based in Birmingham. The picture emerging through the testimony of the group organizers, is of a battle by a few enthusiastic individuals against a wall of apathy. Whilst the legitimacy of the Islamic environmental imperative may be recognized and acknowledged, it would seem it is difficult to persuade individuals to prioritize such matters and turn good intentions into action. This is perhaps surprising considering it has been shown that Muslim communities in the UK are more religiously motivated than comparable non-Muslim populations (Cesari and McCloughlin, 2005, p.42).

The research found that involvement with hands-on activities could be effective in motivating people. In addition, these visible examples of Islamic environmentalism in action were often met with a very positive reaction from non-Muslim members of the community. The organizer of the 'Big Clean' event set up by the Sheffield Islamic Network for the Environment (SHiNE) noted many examples of inter-community goodwill in response to the picking up of litter around the local Mosque. For example, a 'guy coming up to Jamal out of the blue on the street who was white/English looking to shake his hand saying "I really appreciate what you're doing."

Many of those spoken to indicated that the key to encouraging a greater awareness of environmental issues is to

get religious leaders involved. The research found examples of Eco Mosques, such as South Woodford Islamic Centre in London which claims to be the first 'carbon-neutral' place of Islamic worship in Britain. Such incentives show what can be achieved when Imams and mosque committees get behind the environmental message.

Islamic gardens

The Qur'an contains over 160 references to gardens and many of them describe the gardens of paradise awaiting the just in the hereafter (Wescoat, 2003).

God has promised the believers both men and women, 'Gardens graced with flowing streams where they will remain.' (Surah 9:72)

There is a long tradition of gardens flourishing throughout the Islamic world, from the Far East to Islamic Spain (Brookes, 1987). Essentially these gardens were built to be a representation or reflection of heaven on earth and included features such as a four-quartered (*chahar bagh*) walled layout, shade, and running water (Clark, 2004).

It became clear from our research that traditional Islamic gardens in the UK are part of a shared British-Muslim history, shaped by colonialism. An example of such a garden inspired by a love of the oriental aesthetic (if not any spiritual significance) can be found at Sezincote House, in the Cotswolds, itself the inspiration for the Royal Pavilion in Brighton.

It can be argued that along with Islamic art, architecture, and science, Islamic gardens (which to some extent embody all these things) carry the potential for educating all British people about the longstanding and beneficial relationship that Britain has enjoyed with the Islamic world.

Data from the project suggest that British Muslims are not likely to visit botanic gardens – it is parks that figure as the green spaces most likely to be visited. However, public parks in Leeds and Bradford which have large numbers of Muslim visitors as well as Islamic style gardens, report that there is little awareness of the significance of these gardens.

The Muslim visitors do not particularly seem to visit The Alhambra Garden in Roundhay Park, Leeds, preferring the attractions such as 'tropical world' which has activities aimed particularly at families. Visitors don't seem to make the connection between The Alhambra Garden and its Islamic heritage. Perhaps we could include more information about the Islamic connections in our promotional material. (John Roebuck, officer for the Roundhay Park Estate for Leeds City council)

There is obviously much that can be done to make Muslims living in Britain more aware of their own horticultural legacy and the international influence of this heritage, as well as an opportunity for botanic gardens to become involved in raising awareness of this gardening form among all communities.

Once again, it is the less grand grassroots projects we encountered that would seem to hold the key to engaging ordinary British Muslims with the environmental message within their religion. For example, in the socially deprived area of Tower Hamlets a community garden built on Islamic environmental principles has been

successful in encouraging local Bangladeshi women out of their flats and into the local community. It is significant that this project actually involved organizing a trip for these women to the gardens at Kew.

The Gardens of Peace Muslim Cemetery in Ilford was the closest example we found to the 'Qur'anic garden' concept, where plants mentioned in the Qur'an and in *Hadith* form the collection. Recognizing the different climatic conditions of the UK, the driving force behind the project, Maqbul Hussain, has planted varieties suited to British weather. For example the date palm is represented by a palm native to Tasmania. Thus plants from the Qur'an are represented, but in a sustainable way. Despite the Islamic elements the garden is designed to be in keeping with the British setting and, by the inclusion of lawns and familiar churchyard plants such as yew, the overall effect is of a British garden of remembrance. Mr Hussain feels the garden puts people in touch with Islamic environmentalism in a subtle way, though he would like advice on how to grow more plants with an Islamic relevance.



Poster offering composting advice at the Community Garden in Tower Hamlets, London. The garden gives women the opportunity to grow organic vegetables and herbs for cooking and medicinal use. (Kind permission of The Wapping Women's Centre)



Sezincote is an early 19th century house in the Cotswolds built in the 'Indian style' by Sir Charles Cockerell (1755-1837). It includes a large formal Islamic style garden. (Kind permission of Dr Edward Peake)

Conclusion

It would appear that practical, grassroots, community-orientated, inexpensive, 'bottom-up' gardening and conservation projects that reflect the composition and dynamics of local communities are most successful in raising awareness of Islamic horticultural heritage, as well as promoting the Islamic environmental ethic. It is likely that the most effective way for botanic gardens to widen their appeal to the majority of British Muslims is through involvement in such community-based initiatives. By developing an outward facing, collaborative orientation to faith-based communities, botanic gardens can also open opportunities for knowledge exchange. A demonstration of that potential came to light on a visit to the Kensington Roof Gardens.

The researcher was able to point out the Islamic significance of the various features and plants found in the garden. In turn the head gardener explained how advances in horticulture now allow the cultivation of significant plants, related to Islam, previously thought unsuitable for the UK climate such, as olives and palms. The researcher was then able to pass on this information to Muslims keen to grow such plants in their own gardens.

So working with local Muslim communities can benefit botanic gardens by developing a greater insight into the spiritual aspects of Islamic gardening traditions, as well as a better understanding of how botanic gardens can be made more appealing and relevant to these communities. At the same time botanic gardens represent a wealth of botanical knowledge that could help people cultivate plants not usually found in the UK, but which hold a cultural or religious significance for them. Last but not least, the education facilities of botanic gardens could be utilized to help local Muslims gain a greater understanding of and appreciation for their own horticultural heritage.

Note: Translations of the Qur'an are taken from M.A.S. Abdel Haleem, Oxford University Press 'World Classics' series, 2005.

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RÉSUMÉ

Le centre d'étude de l'Islam au Royaume-Uni, à l'Université de Cardiff, a été chargé par le BGCI de réaliser un projet de recherche "inédit" pour enquêter comment, et dans quelle mesure, "les Jardins islamiques" au Royaume-Uni pourraient contribuer à une plus grande participation des musulmans britanniques dans la conservation de la biodiversité et les projets de développement durable (notamment en rapport avec les plantes) et améliorer la compréhension du public en matière d'Islam et du dialogue interreligieux.

Cette recherche a identifié des groupes ayant des convictions environnementales basées sur la foi, souvent en lutte contre l'indifférence au sein de leurs communautés. Bien que les jardins islamiques traditionnels représentent une

historia compartida entre Británicos y musulmanes, es difícil estimar cuántos musulmanes británicos se identifican con estos espacios diseñados.

La mayoría de los musulmanes en Gran Bretaña viven en condiciones socio-económicas de pobreza y, por lo tanto, están poco representados entre los visitantes que frecuentan lugares como los jardines botánicos. Sin embargo, se ha demostrado que la implementación de proyectos de jardinería y de conservación populares, prácticos, de orientación comunitaria de base y no dispendiosos han tenido un cierto éxito en cuanto a la implicación de musulmanes en los problemas relacionados con el medio ambiente. También, parece haber una oportunidad para que los jardines botánicos adopten un enfoque más abierto y se interesen en este tipo de comunidades religiosas al permitirles tener una mejor comprensión de los problemas relacionados con la conservación, el desarrollo sostenible y la biodiversidad.

RESUMEN

La BGCI comisionó al centro de estudios islámicos en el Reino Unido de la Universidad de Cardiff en llevar a cabo por primera vez en su tipo, el proyecto de Jardines botánicos Islámicos en el Reino Unido, en donde se investiga, cómo y en qué extensión estos jardines pueden contribuir a involucrar una mayor cantidad de musulmanes británicos en aspectos de biodiversidad, conservación y sostenibilidad (especialmente en lo que refiere a las plantas), además de incrementar el entendimiento de Islam y los diálogos inter-religiosos.

En la investigación de los grupos medioambientales, se identifica la fe en la que se basan y qué obstáculos son los que a menudo los conducen a una apatía en sus comunidades.

Por otra parte los jardines islámicos representan una historia compartida en la que no está claro que tanto de los musulmanes británicos se identifican con estos espacios. La realidad para la mayoría de los musulmanes viviendo en el Reino Unido es que tienen condiciones socio-económicas pobres, y personas como ellas están poco representadas como



The most effective way for botanic gardens to widen their appeal to the majority of British Muslims is through involvement in community-based initiatives. (Copyright Peter Sanders www.artofintegration.co.uk)

visitantes a jardines botánicos. Sin embargo, se encontró que en la práctica, comunidades orientadas a céspedes, no costosas, ponen en alto la jardinería, los proyectos de conservación y tienen éxito en involucrar, hasta cierto grado a las poblaciones generales de musulmanes en aspectos relacionados con el medio ambiente. En este ámbito, los jardines botánicos pueden acercarse y captar el interés con dicha comunidad y su fe, ayudándolos en ganar el entendimiento de aspectos tan importantes como son la conservación, sostenibilidad y biodiversidad.

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Building bridges over divided communities

The work of Jerusalem Botanical Gardens

What is the role of a botanic garden, in a city claimed by three world religions that is home to people speaking more than 100 languages? This is the challenging question to be answered by the Jerusalem Botanical Gardens (JBG), a 45-acre green lung in the centre of Israel's biggest and fastest growing metropolis.

The Gardens, located next to the Hebrew University campus and close to Israel's parliament, supreme court, and museums, are custodians of the country's largest plant collection, holding some 10,000 species.

Three years ago, management of JBG passed to Oren Ben-Yosef, a young, energetic, Jerusalem native looking for



Children planting together as part of the Jerusalem Botanical Gardens Jewish-Arab coexistence project. (Jerusalem Botanical Gardens)

Nowhere are ethnic, political and religious tensions starker and seemingly more intractable than across the Arab-Israeli divide. **Sue Surkes** reports on a courageous initiative launched by Jerusalem Botanical Gardens to bring Arab and Israeli children together through the medium of plant education.

a challenge. Since then, he has reorganized the Gardens' staff and championed a huge growth in activities. At 180,000, annual visitor numbers have already more than doubled. "I came to the Gardens knowing nothing about plants", says Ben-Yosef, who trained as a social worker, then worked in education, and eventually became a consultant to Israel's Nature and Parks Authority on content design. "We are putting ourselves on the map by developing more activities for a wider range of audiences". Jim Farley, a past president of what is now the San Diego Botanic Garden Foundation, told me that "plants grow people." This is so true that we have adopted the motto too. "Whether it's gifted children or convicts doing community service; whether it's able-bodied or special needs youngsters, or adults who have suffered head injuries ... we see that this place benefits them all."

Finding a common ground

The principal fault line in Jerusalem runs between Jews and mainly Muslim Arabs. Children from each side speak different languages (Hebrew and Arabic) and

study in their own schools. Social contact between them is next to nil. But a year before Ben-Yosef began his new job JBG piloted a coexistence course which has since gone from strength to strength.

Plants are the common ground on which mixed groups of 9- to 11-year-olds come together, for hands-on activities to do with subjects ranging from spice and olive oil production, to the creation of home cures from plant extracts. The youngsters communicate freely using a sort of pigeon tongue, or in creative non-verbal ways, and their teachers are on hand to translate when necessary. Nine meetings are held at the Gardens, but for the tenth meeting children visit each others' schools for planting – an event of great pride for the hosting children, parents and teachers alike.

Plants are not only politically neutral, they form an important part of the daily lives and traditions of both communities so that youngsters from either background are able to contribute equally to the experience and knowledge base of the other. For many children, this is the only opportunity they will

have to meet peers from the 'other side', and it is therefore a critical tool in efforts to break down stereotypes.

This year, JBG plans to design a young environmental leadership course that will be adapted for different populations according to their specific needs and sensitivities. The idea is to bring groups of young people to the Gardens for a year of workshops on plants and leadership. Graduates will then take their knowledge back to their own communities, spending two years helping to create community or school gardens and/or butterfly gardens. "This is a new direction for us," says Ben-Yosef. "We would be very happy to hear from other Gardens running programmes of this kind."

'The almond symbolizes diligence'

Also included in JBG's plans are ultra-orthodox Jews, who account for just under a quarter of the city's population. These children attend separate schools and have negligible contact with the modern world. Boys, in particular, focus on the study of religious texts and pay scant, if any, attention to secular subjects such as science.

"We're bringing orthodox kids out of their study halls into the fresh air for nature-related experiences they would otherwise have much less of," says Leah Garzon, JBG's director of education. One project involves sending Garden staff out into the religious community, to build school gardens together with children and their teachers. A new initiative is to provide teacher training for young orthodox teacher trainees.

"Trees appear in the Old Testament as symbols," says guide, Malkah Abuloff. "The almond symbolizes diligence – and for good botanical reason. It is the first tree to flower in the spring yet its fruits take a long time to mature and can last for years. The mulberry, though, does everything quickly. It's here today, gone tomorrow. If you blink, you'll miss the flowers. The fruits are hardly on the tree before they over-ripen and fall. The girls I took round listened wide-eyed when I went into these biblical analogies. It's a perspective they haven't heard before." To reach broader audiences interested in biblical plants, Christians and Muslims



Reaching out to new audiences. Garden staff are helping to build school gardens with orthodox Jew children and teachers. (Judith Marcus)

among them, JBG are currently upgrading a Bible Path. This means new plantings, new 'outdoor classroom' areas, attractive interpretational aids in Hebrew, Arabic and English (an audio-visual guide will add several more languages) and innovative programming. "In biblical times, people were farmers; they were surrounded by plants," says content designer, Tamar Linchevsky. "The Bible uses plant metaphors to guide human behaviour. It's a language people understood."

Online – the flora of the Holy Land

One exciting new venture involves JBG's head scientist, Dr Ori Fragman-Sapir, who is developing an international online course on the flora of the Holy Land. Several botanic gardens have already expressed interest in taking the course on.

The online studies – aimed at amateur plant and gardening enthusiasts, botanists and bible scholars alike - will conclude with an optional one-week

botanical tour of Israel lead by Dr Fragman-Sapir, a leading authority on wild Israeli flora. Israel sits at the junction between Europe, Asia and Africa, and with some 2,500 native species, is rich in biodiversity.

The Jerusalem Botanical Gardens are divided into geographical sections, a fact that is helping staff to develop a new mission statement and strategic plan. "Geography, diversity of all kinds, and the links between people and plants will underpin the direction we take," says CEO, Ben-Yosef. "Plants, in all their diversity, manage to live together. Perhaps they can help us to do so too."

RÉSUMÉ

Certaines choses sont tout simplement instinctives et la curiosité des enfants pour la nature semble être l'une d'entre elles. Le langage secret entre les enfants et les arbres, la boue, les pierres, les bâtons et les fleurs peut transformer les jardins botaniques en hauts lieux de



Working with a mixed group of Jewish and Muslim Arab children to create home cures from plant extracts. (Judith Marcus)

création de passerelles par-delà les barrières raciales, politiques, religieuses et linguistiques.

Les Jardins botaniques de Jérusalem (JBG) sont situés dans une ville construite sur les fossés entre Israéliens et arabes; juifs, musulmans, et chrétiens; religieux et laïques; ainsi que les locuteurs de différentes langues.

Les programmes innovants du JBG utilisent les plantes pour encourager la coexistence et le contact entre différents groupes. L'un des projets rassemble des groupes mixtes d'enfants juifs et arabes pour qu'ils réalisent des activités pratiques sur des sujets allant de la préparation d'épices à la fabrication de parfums et de cosmétiques à partir d'extraits de plantes. L'une des dix

rencontres consiste en un échange de visites entre les enfants d'une école à l'autre pour effectuer des plantations – un événement d'honneur pour les enfants qui accueillent, de même que pour parents et enseignants.

Un autre projet invite des garçons ultra-orthodoxes à sortir de leur salle d'étude pour mener des activités dans les jardins.

RESUMEN

Parece ser que entre las cualidades intrínsecas de los niños se encuentra su curiosidad por la naturaleza. Existe un lenguaje invisible entre ellos, los árboles, la tierra, las piedras, ramillas y flores que hasta cierto grado pueden ser utilizados por los jardines botánicos como herramientas para construir puentes a través de barreras raciales, políticas, religiosas y lingüísticas.

Los jardines botánicos de Jerusalén (JBG) se encuentran entre poblaciones israelíes, judías, musulmanas y cristianas; religiosas y laicas; y además con diferentes idiomas.

Los programas innovadores de los JBG utilizan las plantas para animar la coexistencia de grupos de niños árabes y judíos, así juntos disfrutaban actividades en temas variados como son preparación de especias, perfumes, cosméticos, todos ellos extraídos de plantas. Se efectúan unas 10 reuniones y en una de ella, niños padres y profesores visitan entre ellos a las diferentes escuelas, con eventos de 'sembrar' en el que todos ellos participan por igual.

Como parte de otro proyecto, en este caso, alumnos de las escuelas ultra-ortodoxas, es el traer a los niños de ellas para actividades en los mismos jardines.

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Resources

RESOURCES

Museums, Prejudice and the Reframing of Difference

This book draws on in-depth case studies and a range of international examples on social issues, political challenges, opportunities and responsibilities that accompany a museums framework.

Richard Sandell combines interdisciplinary theoretical perspectives with in-depth empirical investigation to address a number of questions: How do audiences engage with and respond to exhibitions designed to contest and reconfigure prejudiced conceptions of different social groups? To what extent can museums be understood to shape understandings of difference, acceptability and tolerance?

This highly original contribution presents the significant role that museums can play in confronting prejudice and cross-cultural understanding through accommodating and engaging differences on the basis of gender, ethnicity, class and sexuality.

*Richard Sandell, 2007,
Routledge, www.routledge.com
ISBN-10: 0415367492
ISBN-13: 978-0415367493*

Young Children and the Environment: Early Education for Sustainability

Young Children and the Environment focuses on what early childhood education can do to play its part in helping societies to move towards sustainable living. The driving theoretical underpinning is that even very young children – in childcare settings, kindergartens, preschools and the first years of school - are capable and

RESSOURCES

Les musées, les Préjugés et la Possibilité de Recadrer les Différences

Ce livre est basé sur des études de cas détaillées et une série d'exemples à travers le monde sur les questions sociales, les défis politiques, les opportunités et les responsabilités qui accompagnent la structure d'un musée.

Richard Sandell associe les perspectives théoriques interdisciplinaires avec des enquêtes empiriques approfondies pour traiter différentes questions : Comment le public aborde-t-il et comment réagit-il à des expositions conçues pour contester et reconfigurer des idées préconçues sur différents groupes sociaux ? Jusqu'à quel point les musées peuvent-ils influencer la compréhension de la différence, l'acceptabilité et la tolérance ?

Cet ouvrage, très original, montre le rôle déterminant que peuvent jouer les musées, plaçant les préjugés face à la compréhension des autres cultures, prenant en compte les différences de genre, groupe ethnique, classe et sexualité.

*Richard Sandell, 2007,
Routledge, www.routledge.com
ISBN-10: 0415367492
ISBN-13: 978-0415367493*

Les Jeunes Enfants et l'Environnement : l'Éducation Précoce pour le Développement Durable

« Les jeunes enfants et l'environnement » est centré sur la façon dont l'éducation des très jeunes enfants peut aider les sociétés à aller vers un mode de vie soutenable. La base théorique qui sous-tend ceci est que même les très jeunes

RECURSOS

Museos, Prejuicios y el Replanteamiento de las Diferencias

Este libro está basado en estudios de caso muy detallados y una gama de ejemplos internacionales sobre cuestiones sociales, problemas políticos, oportunidades y responsabilidades que acompañan a una red de museos.

Richard Sandell combina las perspectivas teóricas interdisciplinarias con investigación empírica exhaustiva para abordar una serie de preguntas, tales como ¿Cómo se relaciona el público con las exposiciones diseñadas para impugnar y reconfigurar las concepciones prejuiciadas sobre diferentes grupos sociales? ¿En qué medida los museos pueden contribuir a

conformar el entendimiento de las diferencias, la aceptación y la tolerancia?

Esta muy original contribución muestra el importante papel que los museos pueden desempeñar para enfrentar los

prejuicios y fomentar la comprensión intercultural a través de la inclusión y vinculación de diferencias sobre bases de género, étnicas, clase y preferencias sexuales.

*Richard Sandell, 2007,
Routledge, www.routledge.com
ISBN-10: 0415367492
ISBN-13: 978-0415367493*



competent participants in making and shaping their worlds, both now and into the future.

The book presents ideas, perspectives, pedagogies and case studies that promote the central role of early childhood teachers in enabling young children to act as environmental agents of change. While the authors and examples reflect an Australasian perspective, the text offers insights that will have international appeal.

*Julie M. Davis, 2010,
Cambridge University Press,
<http://www.cambridge.org>
ISBN-13: 9780521736121*

Sustainability Education Perspectives and Practice across Higher Education

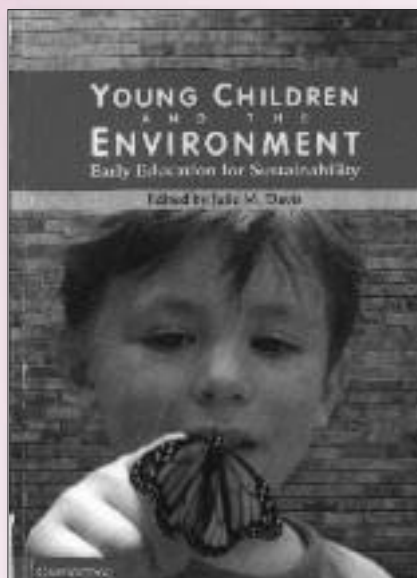
How do we equip learners with the values, knowledge, skills, and motivation to help achieve economic, social and ecological well-being? How can universities make a major contribution towards a more sustainable future? This

book explains why this is necessary and - crucially - how to do it. This response does not only include greening the campus but also transforming curricula and teaching and learning.

The first part of the book provides

background on the current status of sustainability within higher education in the UK, including chapters discussing interdisciplinarity, international perspectives and pedagogy. The second part features case studies from teachers and lecturers in diverse disciplines, describing what has worked, how and why - and what hasn't.

*Paula Jones, David Selby and Stephen Sterling (Eds.), 2010,
Earthscan, London, UK.
www.earthscan.co.uk
ISBN-10: 1844078787
ISBN-13: 978-1844078783*



enfants - dans les crèches, maternelles ou premières années d'école - sont capables et compétents pour participer à la création et définition de leur environnement, à la fois maintenant et dans l'avenir.

Le livre présente des idées, perspectives, pédagogies et cas d'études qui mettent en avant le rôle central des éducateurs de très jeunes enfants, en permettant à ceux-ci d'être acteurs de changements environnementaux. Bien que les auteurs et les exemples choisis reflètent la situation en Australie-Asie, le texte offre des perspectives qui ont une résonance internationale.

*Julie M. Davis, 2010,
Cambridge University Press,
<http://www.cambridge.org>
ISBN-13: 9780521736121*

l'Éducation au Développement Durable : Perspectives et Pratiques dans l'Enseignement Supérieure.

Comment apportons-nous aux étudiants des valeurs, connaissances, compétences et motivations qui permettront d'atteindre un bien-être économique, social et écologique ? Comment les universités peuvent-elles contribuer à aller vers un avenir plus soutenable ? Ce livre explique pourquoi cela est nécessaire et - encore plus important - comment le faire. Il ne s'agit pas seulement de rendre le campus plus vert, mais également de transformer les programmes, l'enseignement et la façon d'apprendre.

Los Niños Pequeños y el Ambiente: Educación Temprana para la Sostenibilidad

Los Niños Pequeños y el Ambiente (Young Children and the Environment) se centra en lo que la educación temprana puede hacer para jugar su parte en ayudar a las sociedades a avanzar hacia una vida sostenible. La premisa conductora teórica es que es que incluso los niños muy pequeños - en guarderías, preescolar y los primeros años de la escuela- son participantes capaces y competentes en la elaboración y configuración de sus mundos, tanto ahora como en el futuro.

El libro presenta las ideas, perspectivas, métodos pedagógicos y estudios de casos que promueven el importante papel de los docentes en la primera infancia en habilitar a niñas y niños pequeños, para que actúen como agentes del cambio ambiental. Si bien los autores y ejemplos reflejan la perspectiva Austral-Asiática, el texto ofrece una visión de interés internacional.

*Julie M. Davis, 2010,
Cambridge University Press,
<http://www.cambridge.org>
ISBN-13: 9780521736121*

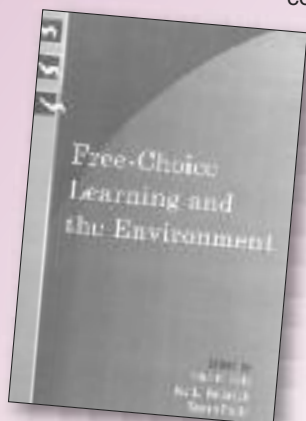
Educación para la Sostenibilidad: Perspectivas y Prácticas en Educación Superior

¿Cómo dotar a los alumnos con los valores, conocimientos, habilidades y motivación para ayudar a alcanzar el bienestar económico, social y ecológico? ¿Cómo pueden las universidades hacer una contribución importante orientada hacia un futuro más sostenible? Este libro explica por qué esto es necesario y - fundamentalmente - como hacerlo. Esta respuesta no sólo busca reverdecer el campus, sino también la transformación de los currícula, la enseñanza y el aprendizaje.

En la primera parte del libro se presentan los antecedentes sobre el estado actual de la sostenibilidad dentro del sistema de educación superior en el Reino Unido, incluyendo capítulos que discuten la interdisciplinarietà, las perspectivas y pedagogía internacionales. La segunda parte

Free-Choice Learning and the Environment

Most environmental learning takes place outside of the formal education system, but our understanding of how this learning actually occurs is in its infancy. By surfing the internet, watching nature documentaries, and visiting parks, forests, marine sanctuaries, and zoos, people make active choices to learn about various aspects of their environment every day.



La première partie du livre fournit des informations de fond sur la prise en compte du développement durable dans les universités aujourd'hui au Royaume-Uni, et comprend des chapitres sur l'interdisciplinarité, des perspectives internationales et la pédagogie. La deuxième partie présente des études de cas d'enseignants et universitaires de diverses disciplines et décrit ce qui a marché, pourquoi et comment, et ce qui n'a pas marché.

*Paula Jones, David Selby and Stephen Sterling (Eds.), 2010, Earthscan, London, UK.
www.earthscan.co.uk.
ISBN-10: 1844078787
ISBN-13: 978-1844078783*

presenta estudios de caso de los maestros y profesores de diversas disciplinas, describiendo lo que ha funcionado, cómo y por qué, y también lo que no.

*Paula Jones, David Selby and Stephen Sterling (Eds.), 2010, Earthscan, London, UK.
www.earthscan.co.uk.
ISBN-10: 1844078787
ISBN-13: 978-1844078783*

Aprendizaje de Libre Elección y el Medio Ambiente

La mayoría de aprendizaje sobre el ambiente ocurre fuera del sistema de educación formal, pero nuestra comprensión de cómo este aprendizaje tiene lugar el realidad está en su infancia. Al navegar por internet, ver documentales sobre la naturaleza y visitar parques, bosques, reservas marinas y zoológicos, las personas toman decisiones activas para conocer diversos aspectos de su entorno cotidiano.

Aprendizaje de Libre Elección y el Medio Ambiente (Free-Choice Learning and the Environment) explora los fundamentos teóricos de la educación ambiental de libre elección, las implicaciones prácticas para aplicar la teoría a la educación de los alumnos de todas las edades, así como las implicaciones políticas para crear oportunidades de educación ambiental nuevas y sostenibles.

*John H. Falk, Joe E. Heimlich and Suzan Foutz, (Eds.), 2009, Alta Mira Press, www.altamirapress.com
ISBN-10: 0759111235
ISBN-13: 978-0759111233*

El Jardín de Aprender: Ecología, Enseñanza y Transformación

Este libro pretende responder a una serie de preguntas que aún permanecen sin resolver en la formación docente: ¿Cómo enseña un jardín? ¿Cuál es el papel del medio ambiente y la comunidad en la formación docente? ¿Cómo aprender a enseñar dentro de la influencia del mundo natural? ¿De qué manera un estudiante se acerca al rol del profesor?

Este libro muestra la historia de cómo se construyó un campus "jardín de aprender" sobre una serie de cohortes de futuros profesores y estudiantes de

Free-Choice Learning and the Environment explores the theoretical foundations of free-choice environmental education, the practical implications for applying theory to the education of learners of all ages, and the policy implications for creating new and sustainable environmental education opportunities.

*John H. Falk, Joe E. Heimlich and Suzan Foutz, (Eds.), 2009, Alta Mira Press, www.altamirapress.com
ISBN-10: 0759111235
ISBN-13: 978-0759111233*

The Learning Garden: Ecology, Teaching, and Transformation

This book sets out to answer a series of questions as yet unaddressed in teacher education: How does a garden teach? What is the role of environment and community in teacher education? How does learning to teach in the natural world influence how a student approaches the role of teacher?

This book tells the story of building a campus 'learning garden' over a series of cohorts of student teachers and environmental education students. The project began with high ideals, no funding, and a strong desire to do something about the environment: the result was a transformation in attitude toward nature, community and toward the learning process itself. Examining the process through three key metaphors - garden as environment, garden as

L'apprentissage Librement Choisi et l'Environnement

La plupart des savoirs environnementaux s'acquièrent en dehors du système éducatif formel, mais notre compréhension de ce processus d'apprentissage est encore balbutiant. En allant sur Internet, en regardant des documentaires sur l'environnement ou en visitant des parcs, forêts, réserves marines ou zoos, les gens choisissent tous les jours de s'informer activement sur leur environnement.

« L'apprentissage librement choisi et l'environnement » explore les bases théoriques de cette éducation à l'environnement librement choisi, les implications pratiques pour l'application théorique à l'éducation de personnes de tous âges, et les implications en termes de politique pour créer de nouvelles opportunités durables d'éducation à l'environnement.

*John H. Falk, Joe E. Heimlich and Suzan Foutz, (Eds.), 2009, Alta Mira Press, www.altamirapress.com
ISBN-10: 0759111235
ISBN-13: 978-0759111233*

Le Jardin Pédagogique : l'Écologie, l'Enseignement et la Transformation

Ce livre tente de répondre à différentes questions non traitées dans la formation des enseignants : comment un jardin

community, garden as transformation - this book provides a bridge between theory and practice for ecology-centered teaching and learning.

Veronica Gaylie, 2009,
Peter Lang Publishing,
www.peterlang.com
ISBN-10: 1433104709
ISBN-13: 978-1433104701

WEBSITES

Growing together: gardening with children and young people with special educational needs

www.rhs.org.uk/schoolgardening/sen

The Royal Horticultural Society (RHS), as part of its Campaign for School Gardening, has just published its pilot project report on Growing together: gardening with children and young people with special educational needs (SEN). The report provides an overview of the project and highlights the benefits of gardening to both SEN pupils and their teachers. The web-site also provides school case studies and teachers' resources for gardening with pupils with SEN.



The impact of school gardening on children's learning and behaviour

http://www.nfer.ac.uk/nfer/publications/RHS01/RHS01_home.cfm?publicationID=497&title=Impact%20of%20school%20gardening%20on%20learning

Following the launch of the Campaign for School Gardening in 2007, the Royal Horticultural Society (RHS) commissioned the NFER (National Foundation for Educational Research) to assess the impact of school gardening

permet-il d'enseigner ? Quel est le rôle de l'environnement et de la communauté dans la formation des enseignants ? Comment le fait d'apprendre à enseigner dans un environnement naturel influence-t-il la façon dont un étudiant envisage le rôle d'enseignant ?

Le livre raconte l'histoire de la construction d'un jardin pédagogique sur un campus sur plusieurs générations d'étudiants - enseignants stagiaires et éducateurs à l'environnement. Le projet a commencé avec des idéaux, aucun financement et un fort désir de faire quelque chose pour l'environnement. Le résultat a été une transformation de l'attitude envers la nature, la communauté et l'apprentissage lui-même. Examinant le processus à travers trois métaphores -le jardin comme environnement, le jardin comme communauté et le jardin comme transformation, le livre indique une voie entre la théorie et la pratique pour l'éducation et l'apprentissage centré sur l'environnement.

Veronica Gaylie, 2009,
Peter Lang Publishing,
www.peterlang.com
ISBN-10: 1433104709
ISBN-13: 978-1433104701

SITES INTERNET

Pousser ensemble : jardiner avec des enfants et jeunes ayant des besoins éducatifs particuliers

www.rhs.org.uk/schoolgardening/sen

La Société royale d'horticulture (Royal Horticultural Society -RHS), vient de publier, dans le cadre de sa campagne pour les jardins à l'école, le compte-rendu d'un projet pilote « Pousser ensemble : jardiner avec des enfants et jeunes ayant des besoins éducatifs particuliers ». Le rapport fournit un aperçu du projet et souligne les avantages du jardinage, pour les élèves et leurs enseignants. Le site fournit également des études de cas et ressources pour les enseignants pour jardiner avec des élèves ayant des besoins éducatifs particuliers.

L'impact du jardinage à l'école sur l'apprentissage et le comportement des enfants

http://www.nfer.ac.uk/nfer/publications/RHS01/RHS01_home.cfm?publicationID=497&title=Impact%20of%20school%20gardening%20on%20learning

educación ambiental. El proyecto comenzó con grandes ideales, sin financiamiento, pero con un fuerte deseo de hacer algo por el medio ambiente: el resultado fue una transformación en la actitud hacia la naturaleza, la comunidad y hacia el propio proceso de aprendizaje. Examinando el proceso mediante tres metáforas clave -el jardín como ambiente, el jardín como comunidad y el jardín como transformación - este libro proporciona un puente entre la teoría y la práctica para una enseñanza y aprendizaje centrados en la ecología.

Veronica Gaylie, 2009,
Peter Lang Publishing,
www.peterlang.com
ISBN-10: 1433104709
ISBN-13: 978-1433104701

SITIOS WEB

Creciendo juntos: jardinería con niños y jóvenes con necesidades especiales

www.rhs.org.uk/schoolgardening/sen

La Real Sociedad de Horticultura del Reino Unido (RHS por sus siglas en Inglés), como parte de su Campaña por la Jardinería en la Escuela, acaba de publicar su informe sobre el proyecto piloto titulado Creciendo Juntos: Jardinería con Niños y Jóvenes con Necesidades Educativas Especiales (SEN por sus siglas en Inglés). El informe proporciona una visión general del proyecto y destaca los beneficios de la jardinería para los alumnos con necesidades educativas especiales y sus profesores. El sitio web también ofrece estudios de casos escolares y recursos de jardinería para docentes con alumnos con necesidades educativas especiales.

El impacto de los huertos escolares en el comportamiento y aprendizaje de los niños

http://www.nfer.ac.uk/nfer/publications/RHS01/RHS01_home.cfm?publicationID=497&title=Impact%20of%20school%20gardening%20on%20learning

Tras el lanzamiento de la Campaña por la Jardinería en la Escuela en 2007, la Real Sociedad de Horticultura del Reino Unido (RHS) encomendó a la Fundación Nacional para la Investigación Educativa (NFER por sus siglas en Inglés) la evaluación del impacto de la jardinería

on children's learning and behaviour. This report presents the findings from the qualitative study of a representative sample of 10 schools participating in the Campaign. The findings suggested that schools which actively use a garden, contribute to the personal, emotional, physical and social development of the young learners.

Environmental education research blog for educators

<http://naaeersearch.wordpress.com/>

EEResearch is a blog that communicates environmental education research to educators. Short overviews and published abstracts are posted weekly to help educators adapt and improve their practices to reflect current research. The goal is to improve education programmes based on sound research findings. The content of the blog is compiled by NAAEE (North American Association for Environmental Education) Research Commission, and Cornell University.

Food for Life Partnership

<http://www.foodforlife.org.uk/>

The Food for Life Partnership is a network of schools and communities across England committed to transforming food culture. The network is working towards changing schools meals, reconnecting young people with farms and inspiring families and communities to cook and grow food. The Partnership involves four food focused charities – the Soil Association, Focus on Food Campaign, Health Education Trust and Garden Organic – and encourages schools, teachers, caterers, food producers, pupils and health professionals to work together to create a better food culture for young people and to involve their local communities all across England.



Suite au lancement de la campagne des jardin pour les écoles 2007, la Société royale d'horticulture (Royal Horticultural Society – RHS) a missionné la Fondation nationale pour la recherche pédagogique (National Foundation for Educational Research – NFER) pour évaluer l'impact du jardinage à l'école sur les apprentissages et comportements des enfants. Ce rapport présente les résultats de l'étude qualitative sur un échantillon représentatif de dix écoles participant à la campagne. Ces résultats suggèrent que les écoles qui utilisent un jardin de manière active contribuent au développement personnel, émotionnel, physique et social des jeunes apprenants.



Un blog sur la recherche en éducation à l'environnement pour les éducateurs

<http://naaeersearch.wordpress.com/>

EEResearch est un blog qui informe les éducateurs sur la recherche en éducation à l'environnement. Des résumés sont postés chaque semaine pour aider les éducateurs à adapter et améliorer leurs pratiques en fonction des recherches actuelles. L'objectif est d'améliorer les programmes d'éducation en se basant sur des résultats de recherches fiables. Le contenu du blog est fourni par la Commission recherche de l'Association nord-américaine pour l'éducation à l'environnement (North American Association for Environmental Education - NAAEE) et l'université de Cornell.

Le Partenariat Des Aliments pour la Vie

<http://www.foodforlife.org.uk/>

Le Partenariat Des aliments pour la Vie (Food for Life) est un réseau d'écoles et de communautés à travers l'Angleterre qui sont déterminés à changer les habitudes alimentaires. Le réseau travaille pour changer les menus des

escolar en el aprendizaje y comportamiento de los niños. Este informe presenta los resultados del estudio cualitativo de una muestra representativa de 10 escuelas participantes en esa Campaña. Dichos resultados sugieren que las escuelas que utilizan un jardín activamente, contribuyen al desarrollo personal, emocional, físico y social de los jóvenes estudiantes.

Blog sobre Investigación en educación ambiental para educadores

<http://naaeersearch.wordpress.com/>

EEResearch es un blog que pone al alcance de los educadores la investigación en educación ambiental. Descripciones breves y resúmenes publicados son colocados en línea semanalmente para ayudar a los educadores adaptar y mejorar sus prácticas, a fin de reflejar la investigación más actual. El objetivo es mejorar los programas de educación con base en resultados destacables, producto de la investigación. El contenido del blog es compilado por la Asociación Norteamericana de Educación Ambiental (NAAEE por sus siglas en Inglés), por la Comisión de Investigación y la Universidad de Cornell.



Asociación Alimentos para la Vida

<http://www.foodforlife.org.uk/>

La Asociación Alimentos para la Vida (Food for Life Partnership) es una red de escuelas y comunidades de Inglaterra, comprometida con la transformación de la cultura alimentaria. La red está trabajando para cambiar las comidas que se consumen en la escuela, vinculando al mismo tiempo a los jóvenes con las granjas e inspirando a las familias y las comunidades inspiración a cultivar y cocinar sus propios alimentos. La Asociación

Garden Organic for schools

<http://www.gardenorganic.org.uk/organicgardening/schools.php>

Garden Organic is a UK charity dedicated to research and promoting organic gardening, farming and food. Over 10% of UK schools have joined Garden Organic's free educational programme, Garden Organic for Schools, helping pupils learn about food and organic growing. The website provides information on the resources available through the charity's Education Programme, including free on-line resources for educators / teachers.



SCIENTIX 'Search, find and engage'

<http://www.scientix.eu/>

Scientix – the community for science education in Europe – is a new web-portal launched by the European Commission, which targets teachers, educators, researchers, policy makers and anyone interested in science education. 'Search, find and engage' are the words that summarise the philosophy of this web-based community that facilitates regular dissemination and sharing of news, know-how, and best practices in science education. Scientix gives access to a wealth of teaching resources, research results and policy documents from European science education projects. This new portal is available in six languages: English, French, German, Spanish, Italian and Polish.

repas scolaires, remettre les jeunes en relation avec des fermes, et encourager les familles et communautés à cuisiner et faire pousser leur propre nourriture. Le Partenariat regroupe quatre associations caritatives qui s'occupent d'alimentation – la Soil association, Focus on Food Campaign, Health Education Trust et Garden Organic – et encourage les écoles, enseignants, intendants, producteurs, élèves et professionnels de la santé à travailler ensemble pour développer de meilleures habitudes alimentaires chez les jeunes et impliquer leurs communautés à travers l'Angleterre.

Jardin Biologique - programme pour l'école

<http://www.gardenorganic.org.uk/organicgardening/schools.php>

Jardiner Bio (Gardening Organic) est une association du Royaume-Uni qui a pour objet de faire de la recherche et promouvoir le jardinage, les fermes et l'alimentation biologiques. Plus de 10% des écoles britanniques ont rejoint le programme pédagogique gratuit de Gardening Organic, qui aide les élèves à apprendre des choses sur l'alimentation et la culture biologique. Le site Internet fournit des informations sur les ressources disponibles grâce au programme pédagogique de l'association, y compris des ressources en ligne gratuites pour les éducateurs et enseignants.

SCIENTIX « Chercher, trouver, discuter »

<http://www.scientix.eu/>

Scientix – la communauté pour les sciences de l'éducation en Europe – est un nouveau portail sur Internet lancé par la Commission Européenne, lequel est destiné aux enseignants, aux éducateurs, aux chercheurs, aux décideurs et à tous ceux qui sont intéressés par les sciences de l'éducation. « Chercher, trouver et discuter » sont les mots qui résument la philosophie de cette communauté basée sur la toile qui facilite une diffusion régulière et le partage des nouvelles, des savoir-faire et des meilleurs pratiques en matière des sciences de l'éducation. Scientix donne accès à une profusion de ressources éducatives, des résultats de recherche et les règlements provenant des projets Européens sur les sciences de l'éducation. Ce nouveau portail est rédigé en six langues : Anglais, Français, Allemand, Espagnol, Italien et Polonais.

involucra a cuatro organizaciones de beneficencia con énfasis en alimentos - Soil Association, Focus on Food Campaign, Health Education Trust and Garden Organic- y alienta a las escuelas, profesores, empresas dedicadas al servicio de banquetes, productores de alimentos, estudiantes y profesionales de la salud a trabajar juntos para crear una mejor cultura de la alimentación para los jóvenes e involucrar a sus comunidades locales en toda Inglaterra.

Jardín Orgánico – programa escolar

<http://www.gardenorganic.org.uk/organicgardening/schools.php>

Garden Organic (Jardín Orgánico en Español) es una organización de beneficencia dedicada a la investigación y la promoción de la jardinería, agricultura y los alimentos orgánicos. Más del 10% de las escuelas del Reino Unido se han unido al programa educativo gratuito de Garden Organic, Garden Organic for Schools, ayudando a los alumnos a aprender más sobre los alimentos y su cultivo orgánico. El sitio web proporciona información sobre los recursos disponibles a través del Programa de Educación de la organización, incluyendo recursos gratuitos en línea para educadores / maestros.

SCIENTIX 'Buscar, encontrar y atraer'

<http://www.scientix.eu/>

Scientix – La comunidad para la ciencia y educación en Europa – es un portal nuevo fundado por la Comisión Europea orientado a maestros, educadores, investigadores, tomadores de decisiones políticas, y cualquier otra persona interesada en la educación de la ciencia. 'Buscar, encontrar y atraer' palabras que resumen la filosofía de esta red electrónica comunitaria la que facilitará regularmente el compartir y diseminar noticias relacionadas con la educación de la ciencia, el saber cómo y cuáles serían sus mejores prácticas. Scientix proporciona acceso a una riqueza enorme de recursos didácticos, resultados de investigaciones y documentos normativos de los proyectos de ciencia Europeos. Este portal nuevo se encuentra disponible en seis idiomas: inglés, francés, alemán, español, italiano y polaco.

New Pan-European Education Project - INQUIRE



Partners at the Inaugural meeting of the INQUIRE project, Brussels, 20-21 January 2011

BGCI is delighted to be a partner in INQUIRE, a newly funded European Union project which aims to reinvigorate inquiry-based science education (IBSE) in formal and informal education systems (specifically Learning Outside the Classroom sites) throughout Europe.

Designed to reflect how students actually learn, IBSE also engages them in the process of scientific inquiry. Increasingly it is seen as key to developing their scientific literacy, enhancing their understanding of scientific concepts and heightening their appreciation of how science works.

Whereas traditional teaching methods have failed to engage many students, especially in developed countries, IBSE offers outstanding opportunities for effective and enjoyable teaching and learning. It provides stimulating environments for students to explore their learning in authentic situations.

Knowledge is built through testing ideas, discussion with teachers and peers, and direct interaction with scientific phenomena. In fostering a practical, hands-on approach, IBSE can lead to a 'minds-on' comprehension of scientific concepts.

The objectives of INQUIRE are:

1. To introduce IBSE in formal and informal settings on a large scale
2. To snowball best practice pedagogical approaches through practitioner training
3. To establish a key network of educators, teachers, teacher trainers and researchers for the revival of IBSE
4. To offer front-line support to teachers and informal educators to practice IBSE
5. To use IBSE to engage young people in a scientific discourse about biodiversity conservation and climate change
6. To bridge the gap between educational researchers and practitioners
7. To support the development of European wide standards for evaluating formal and informal education programmes
8. To make the case for inquiry and context based learning
9. To examine the implementation of curriculum based innovations
10. To stimulate and motivate science learning from the earliest stage
11. To increase self-confidence in girls to study science

Coordinated by Innsbruck University Botanic Garden with support from Botanic Gardens Conservation International, INQUIRE will involve 17 partners in 11 countries. A one-year training course will be developed for LoTC educators in inquiry-based learning methods, research methodology and assessment techniques. Through training, ongoing mentoring and promotion of best practice, the project will aim to roll this course out to as many providers as possible and embed this pedagogy within European education systems.

The subject content of the course will focus on the major global issues of the 21st Century: biodiversity loss and climate change and will build on already published teaching resources as well as on newly created resources. Botanic gardens and other LoTC institutions are wonderful learning sites for children and adults alike. Engaging these sites in offering teacher training courses in IBSE techniques will be an effective way to motivate teachers to implement inquiry learning in classrooms.

List of INQUIRE Partners:

1. University of Innsbruck, Institute of Botany, Austria
2. Botanic Gardens Conservation International, U.K.
3. King's College London, U.K.
4. Museo Tridentino di Science Naturali, Trento, Italy
5. Royal Botanic Gardens, Kew, U.K.
6. Royal Botanic Garden, Madrid, Spain
7. University of Bremen, Institute of Biology Education, Germany
8. University Botanic Gardens of University of Sofia, Bulgaria
9. National Botanic Garden of Belgium
10. Schulbiologiezentrum Hannover, Germany
11. Bordeaux Botanic Garden, France
12. University of Coimbra Botanic Garden, Portugal
13. Botanic Gardens of the M.V.Lomonosov Moscow State University, Russia
14. University of Oslo, Natural History Museum, Botanic Garden, Norway
15. Botanic Garden & Rhododendron-Park, Bremen, Germany
16. Royal Botanic Garden, Juan Carlos I, Spain
17. University of Lisbon, National Museum of Natural History, Botanic Garden, Portugal



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Plants for the Planet

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

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



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

22-26 October 2012

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

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



To register your interest in the congress visit: www.bgci.org/education/congress Los interesados en participar pueden registrarse en la siguiente dirección:

www.bgci.org/education/congress