

# A global snapshot of botanic garden education provision

**Sarah Kneebone and Julia Willison**

Botanic Gardens Conservation International, Surrey, U.K.

Botanic gardens offer vibrant sites for learning. Evidence for this comes from a recent international survey carried out by Botanic Gardens Conservation International (BGCI) in September 2006. The aim of the survey was to examine the current status of education in botanic gardens. It looked at a wide range of issues, including the numbers and types of audiences reached, the type of education provision offered, whether evaluation is used and what messages are communicated. The survey also focused on the staffing levels of educators in botanic gardens, how much time is spent on education per week and what garden departments are involved with education provision.

Over 120 people responded to the survey, providing a fascinating picture of what is happening in education in botanic gardens worldwide. With limited resources, educators are clearly reaching vast numbers of people each year with messages of plant conservation. This paper will present the results of this survey and will highlight some of the innovative and imaginative programmes run in botanic gardens. It will demonstrate that botanic gardens contribute significantly to Target 14 of the Global Strategy for Plant Conservation and that this work needs to be further supported.

## Introduction

The development of a survey of the current state of education in botanic gardens came out of discussions for an education strategy for BGCI in 2005. The need for a global snapshot was identified within the education strategy, to support one of the purposes of the BGCI education work; reaching wider audiences and promoting the world wide education roles of BGCI and botanic gardens. The education strategy team decided that development of a survey would help achieve this purpose:

## Why do we need a global study on the current state of education in botanic gardens around the world?

- There is no data currently available on the role of education in botanic gardens; other than individual case studies we do not know what gardens are actually doing in their education programmes.
- The research will provide a resource for further networking of BG educators within and between countries, as gardens doing similar work can contact each other for support
- The findings will provide ideas for authors for publications and at congresses, so they can focus on areas that are currently lacking or are popular in education in botanic gardens
- The data could form basis of paper on the role played by education in botanic gardens in environmental education.
- This research will also provide real evidence for areas in need of support, such as under resourced departments, or lacking in technical expertise or staff etc
- It will also demonstrate what areas are doing well and which garden have invested in their education provision
- The data will compliment that already on the botanic gardens database

## Methodology

The BGCI education team developed a series of questions for inclusion in the gardens database. These were reviewed and refined and the most pertinent questions were developed into a questionnaire. A hard copy paper questionnaire was distributed at 6th International Congress of Education in Botanic Gardens, September 2006 and also sent out with *Roots*, the education review, in October 2006. So far over 120 responses to the survey have been received. Additional queries generated from responses have been followed up by email. The data have been entered to access database, and analysed. This database will be connected into the existing gardens database information. This means that individuals responsible for education programmes in their gardens can gain access to their garden's profile and change it, to keep it up to date.

## Data collected

The questionnaire covered a wide range of issues including;

- numbers and types of audiences reached,
- methods used to communicate,
- whether evaluation is used, what methods
- what topics are communicated
- numbers of educators in botanic gardens,
- how much time is spent on education per week
- what/if other garden departments are involved with education provision
- where funding is sourced from

## Results

The questionnaire was designed around series of questions we wanted to find the answers to about the current state of education in botanic gardens. Hopefully this initial data can be explored further and used in the future for comparison, to review how education provision changes and evolves.

## Investing in Education

We wanted to discover whether gardens view education as an important part of their work, by finding out if it is included in vision and mission statements and also whether this stated importance is supported by financial provision.

### **What proportion include education within their vision/mission statements?**

107 out of 118 = 91% include education in their mission or vision

If gardens view education as important, do they then invest financially in education?

### **How many allocate a specific budget for education work?**

79 out of 117 gardens = 68% have a budget allocated specifically for education, which is excellent news and a good start, but 28 % said they did not have a budget for education – over 1/4 of gardens who answered the survey.

This demonstrates there is still much work to be done to demonstrate the importance of education and investing in education provision.

### **Of the gardens that say education is important, what % allocate a budget for education?**

Interestingly, more gardens recognise that education is important than are willing to put their money where their mouth is – of those who say that education is part of their mission, 26% do not have a budget specifically for education.

This is a familiar story – gardens know that education is important, that it has an impact on conservation and is necessary to achieve the protection of plant diversity, as specified in the GSPC, but are not willing to invest resources in its provision. How can we encourage gardens to do this?

### **Do gardens invest staff time in education?**

How many staff hours are spent on education per week?

The answers for this are quite heavily skewed due to a couple of sites who have very large departments. In total, from 106 gardens that replied, nearly 12000 hours a week are spent on education – which is about 112 hours per week on average – this equates to nearly 3 full time members of staff working on education per garden. However, if we remove the top two – which account for ¼ of the total hours, it works out at 78 hours per week, just under 2 full-time staff working on education.

There seems to be a lack of use of volunteers in the education sector, 43 % have no hours per week of volunteer time spent on education. However, those that have volunteers, use them – the total time from 101 gardens answering was nearly 5000 hours per week unpaid work on education – this is an average of 47 hours per week, over half the amount of paid education work.

Volunteers could be seen to be an underutilised resource for education teams to consider using.

### **What status does education have within the garden?**

Assumption is that if education is lower status, gardens will not invest in it by employing qualified staff to run the education programme, as they cost more.

<b>What proportion of staff working in education have education qualifications?</b>				
	full time paid staff	part time paid staff	full time volunteers	Part-time volunteers
Total number working in botanic gardens	549	382	314	1949
Number with education qualifications	258	128	7	226
<b>Percentage</b>	<b>47</b>	<b>33</b>	<b>2</b>	<b>12</b>

Could it be that qualified educators cost more and that gardens are unwilling to invest additional funds in their education provision? What do you think? Is there a need here for additional training?

## Reaching Audiences

### What audiences are being targeted by botanic garden education and in what numbers?

In order, the audiences targeted by botanic garden education provision are as follows:

Rank	Audience type	Number	Percent
=1	School children aged 5- 11	99	85
=1	School children aged 11- 16	99	85
3	University students	94	81
4	School children aged 16-18	90	78
5	Families	86	74
6	Tourists	77	66
7	Community groups	73	63
8	School children aged 0 -5	67	58
9	Professional educators	66	57
10	Senior citizens	57	49
=11	Garden staff	47	41
=11	Special interest groups	48	41
13	Special needs groups	42	36
14	Decision makers	21	18
15	Business leaders	17	15

### Which are the most common audiences to target?

There is a higher proportion of education provision aimed at secondary school children and university students than might be assumed at first. It is generally felt that it is harder to encourage secondary teachers to bring their classes to gardens due to clashes in timetabling, the lack of plant science in curricula and an increase in bureaucracy that attends a school trip. However, gardens seem to be providing for this group, which is excellent in terms of maintaining contact between teenagers and nature.

The results are very positive, as they show gardens have provision in their education to target families, tourists and involve communities. Over half provide for professional educations, an efficient method of using the multiplier effect to communicate messages about plant diversity and conservation beyond the garden wall. Just under half provide specifically for senior citizens, which is interesting as, particularly in developed countries, they make up a large proportion of botanic garden visitors, botanic garden friends groups (pers comm. Kew Gardens Friends membership dept 2007), volunteers and have significant disposable income, for example In the UK the over-50's have a collective disposable income of £175bn – 30% more than the under 50's

([http://www.saga.co.uk/corporate/magazine/saga\\_media\\_pack\\_august\\_06.ppt#2](http://www.saga.co.uk/corporate/magazine/saga_media_pack_august_06.ppt#2) accessed 29/3/07)

Kew friends membership – 50% is over 60, whereas the proportion of over 60 year olds in UK population = 21%. Therefore, much higher proportion of over 60 year olds are supporters of Kew than there are in the general population

Decision makers and business leaders have been identified as being those least targeted by education programme, with 1/5 of gardens actively targeting decision makers with their provision. If gardens do start to target politicians and decision makers then the impacts they could have rise considerably. This has additional possible impacts for the funding of programmes.

### **What about groups with special interests or special needs?**

Many gardens welcome special interest groups, among those identified include environmental groups, particularly ornithologists, horticulturalists/ garden lovers and botanists, religious groups, professionals such as foresters and agriculturalists and eco-tourists.

About 1/3 of gardens have provision for groups with special needs. The most commonly identified were visually impaired, physically disabled and those with learning difficulties or mental disability. To put this into perspective, the United National Development Programme (Helander 1999, quoted in Price and Stoneham) estimates global figures of moderately and severely disabled people to be 335 million in 2000 – 5.5% of the world population, increasing to 667 million by the year 2035.

In the UK 6.5 million people are formally classified as disabled (over 10% of the population), 10 % of these are wheelchair users. There are 1.1 million people with a visual impairment severe enough to be eligible to register as blind or partially sighted, 7 million with literacy problems and 1 million with learning disabilities (Price and Stoneham, 2001), so in a population of 60 million, one in six people could have difficulty accessing the education provision. Working with access groups can help ensure that botanic gardens are equipped to ensure inclusion and accessibility for all their audiences.

### **How many people participate in Botanic Garden education programmes?**

	<b>Total</b>	<b>Average</b>
School children aged 0 -5	188177	1940
School children aged 5- 11	349485	4017
School children aged 11- 16	270268	3256
School children aged 16-18	131821	1533
University students	125154	1472
Professional educators	10610	114
Community Groups	61380	731
Families	1120958	13506
Senior citizens	49691	540
Tourists	533960	6357
Business leaders	4102	36
Decision makers	3895	34

Garden staff	13929	144
Special needs	1415	16
Special interest	9895	110
Totals	2874740	33805

NB - This is an initial review and is not necessarily indicative of the true situation – further research and analysis is needed before we can estimate the numbers of people being reached by garden education programmes per year.

## Funding Fun

How is garden education provision funded?

### What proportion of the different sources of funding are used by gardens?

Rank	Source of funding	Number	Percentage
1	government	64	58
2	participation fees	54	49
3	donor gifts	33	30
4	foundation grant	32	29
5	corporate grant	23	21
6	membership	19	17
7	no funding	17	15

Other sources of funding that are used to support the education programmes include the local county or city council, affiliated universities, small grants, such as the National Lottery or EU funding and donations from garden supporters, including Friends groups.

Looking at this data, and comparing it with the audiences that are currently being targeted by garden education programmes, there is a distinct gap – the decision makers and donors which are actually handing money over, are not being targeted –there is little provision for them. As we can see from the other data, education provision seems to be suffering from a lack of resources – maybe those responsible for education can develop ways of reaching those people who may be able to offer the additional financial support their programme and development needs.

Another question we had from this data is that, if there is no specific budget or funding set aside for education in botanic gardens, where does the money come from?

## 21<sup>st</sup> Century Programmes?

### Are botanic gardens addressing key issues of the day through their education provision?

*What themes are being focused on with the garden education provision?*

## Target 14 of the GSPC states

*'The importance of plant diversity and the need for its conservation incorporated into communication, educational and public-awareness programmes'*

**Plant diversity and conservation**

= 91/116

**..and ethnobotany**

= 76/116

**...and endangered species**

= 66/116 = 57%

Rank	Theme	Number	Percentage
1	plant diversity	104	90
2	conservation	97	84
3	ethnobotany	91	78
4	plant science	88	76
5	endangered species	86	74
6	horticulture	75	65
7	environmental appreciation	66	57
=8	environmental degradation	56	48
=8	recycling	42	36
10	water conservation	42	36
11	climate change	39	34
12	food security	32	28
13	landuse	30	26
14	poverty alleviation	21	18
15	fair trade	18	16
16	societal change	16	14

Botanic gardens are stalwarts of the GSPC and much of their work, including their education programmes, directly support the GSPC and its targets. This is no different with education – 90% of gardens cover plant diversity as one of their key themes and it is the most common topic covered by education provision. This is

swiftly followed by conservation at 84%, ethnobotany at 78 % and endangered species at 74%. Between these three themes, gardens are directly supporting all the aspects of Target 14.

Botanic gardens are also still bastions of the traditional skills and academic learning about plants which, some might say, are being lost from traditional formal education provision at schools and universities (Newton, 2007). Plant science is covered by 76% of garden and horticulture by 65%

What is not so common is addressing environmental issues and problems of the 21<sup>st</sup> century – there seems to be a little of the ‘ivory tower’ syndrome within gardens. At a time when climate change is at the top of the political and environmental agendas, only one third of gardens are talking about it in their education programmes. We know that plant diversity conservation can only take place with dramatic behavioural change, towards a more sustainable way of living, among developed and some developing countries.

However, botanic garden do not seem to be leading the way on facilitating the changed needed - only 16% look at fair trade, 14 % at societal change, 18% look at poverty alleviation, and just over 1/3 look at water conservation and recycling. If we are to be effective at moving on from merely promoting towards enabling the conservation of plant diversity, we must address these themes and show our audiences how their behaviour can and does make an impact on the environmental problems we have created and face.

## Methods used

### What are botanic gardens using for their CEPA provision, how are they communicating their messages to their diverse audiences?

Guided tours	92	Self guided trails	56	Workshops	63
‘Touch tables’/‘Discovery carts’	23	Theatre	25	Training Courses	52
Talks / Lectures	78	Music	24	Video screens	18
Leaflets	67	Loan of resource kits	15	Art and crafts	42
Interpretation panels	65	Posters	51	Dance	15
Exhibitions	69	CD Rom	12	Website	46
Poetry	14	Worksheets	36	Fact sheets	26
Debate	12	Other (s), please state			

Very varied selection of methods used. It is interesting that the top two, guided tours and talks, are both face-to-face forms of interpretation – humans are a social species and personal interaction can be a very effective method for communication (Honig, 2000). This will be an interesting data set to refer back to in order to review how methods change over time – currently debate is used relatively little, but it may be that as BGs become more aware of their role in societal change for sustainable development, this increase. Likewise, the use of the arts in communication and education in gardens. Nearly half those surveyed use art and craft, but only a few use other art media such as poetry, music, theatre and dance.



## Judging Effectiveness

How do gardens know that their programmes are effective? Do they evaluate?

*How do gardens know that their education provision is effective? Do they carry out evaluation?*

### What methods do gardens use to evaluate?

How often do they evaluate?	Number	Percentage
Always	23	20
Usually	24	21
Sometimes	35	30
Not very often	25	21
Never	8	7
Don't know	2	2

Rank	Method of evaluation	Number	Percentage
1	observation	67	60
2	interviews	59	53
3	self admin ques	52	47
4	visitor profile	41	37
5	focus groups	23	21
6	no evalu	16	14

Other methods gardens use to evaluate include visitors books, in the garden and online, postcard evaluation, stakeholder meetings discussion and pre and post testing. Some garden also contract out formal evaluation of major programmes to professional evaluators.

Most gardens are carrying out some form of evaluation of their programmes, with a range of techniques used. The application of evaluation seems to be growing in importance. This may also indicate the increasing status of education provision and willing to invest resources into monitoring

It is great to see that gardens are employing a range of techniques to evaluate their programmes, but there are gaps.

### What do they not use?

The least used type of evaluation is focus groups. This may be due to the time and costs involved or perceived to be involved with setting up and running focus groups. However, this is unfortunate as, particularly with

programme development, focus groups can be very useful, to find out how particular audiences might react to a specific product or programme (Diamond 1999)

**When is an educator not an educator? When they are a researcher / manager / horticulturalist or administrator**

Who is involved with education in the garden – is there a dedicated education department or is it run part time by other departments, or is it a team effort with everyone involved?

**What proportion have a dedicated education team?**

Rank	Group	Number	Percentage
1	Education	78	71
2	horticulture	65	59
3	volunteers	59	54
4	admin	48	44
5	management	42	38
6	research	41	37
7	marketing	23	21
8	sales	16	15

**What proportion have other departments running the education?**

On average, 3.4 departments are involved with running the education programme. The most likely combination is the education department working with the horticultural team and the volunteer group to deliver a garden's education provision.

**Which is the most common department to run education if it isn't education?**

If there is no dedicated education department, then the mostly likely groups to be involved with running education provision are the horticultural team and the administration department, followed by volunteers and management

Rank	Group	Number	Percentage
=1	horticulture	14	23
=1	admin	14	23
=3	volunteers	11	18
=3	management	11	18
4	research	10	16
5	marketing	1	2
6	sales	1	2

## How Resourceful

How well resourced is the education provision in the garden – are there basic facilities available for use by the education programme?

Rank	Resource	Number	Percentage
1	toilets	92	80
2	plant material	84	73
3	Library	72	63
4	Classroom	73	63
5	exhibition space	66	57
6	arena	63	55
7	refreshment area	47	41
8	artifacts	45	39
9	Education centre	42	37
10	lecture theatre	36	31

### What facilities are available in the garden for education and what are people missing?

One fifth are missing toilets, this is difficult for access for visitors, as any visit has to be short.

Surprisingly only just over 1/3 of respondents said they had any artefacts to use. When compared to the proportion that use ethnobotany as one of their themes, this suggest that there is a lack of practical physical examples for educators to use in their programmes. Far more, 73%, said they had fresh plant material available, but even this means that 27% do not have fresh material, which is surprising considering they are in a garden. Gardens should ensure that educators and horticulturalists work closely together to make sure sufficient fresh material can be used for education purposes.

### Networking

Rank	Organisation linked	Number	Percentage
1	Schools	94	82
2	Other BGs	91	79
=3	Local cons orgs	55	48
=3	Regional cons group	55	48
5	Government	53	46
6	Envtal educ network	53	46

7	Science org	47	41
8	Int cons org	46	40
9	Overseas org	33	29
10	Edu research org	32	28
11	Zoos	29	25
12	No links	2	2

### Are botanic gardens linked to other education institutions?

Botanic gardens seem to be extremely well networked within the educational field - only 2% of respondents said they had no links, and even then they must be connected with BGCI to have received a questionnaire. Links are valuable as they can become routes to potential partnerships, whether through project development or expansion or support for capacity building or finance. The strongest links are with schools – 84% of garden have connection with them, as illustrated by the strong student participation in education programmes, followed by 79% connected with other botanic gardens.

### Do they have contacts with similar groups that they could develop partnership programmes with?

About half of respondents are connected with local or regional conservation groups, which could lead to potential *in situ* conservation projects, with complementary education programmes. A similar number are connected with government and environmental education networks – also positive both for the potential impact of policy makers and also for promoting the work of botanic gardens in the environmental education field.

Particular areas for development are in the education research – less than 1/3 (28%) have links with education research organisations, increased partnership could be used to develop investigations into the provision and impact of education within the garden, thus strengthening its position, and help ensure educator's practices and skills are based on the latest in education pedagogy. Another area is with zoos – there are often zoos in the same city as botanic gardens, they also offer education focused on conservation and the environment and a joint programme can demonstrate the complexity and wonder of ecosystems, rather than focusing on plants in isolation from the rest of nature.

### Education and new media - best buddies or worst enemies?

Is botanic garden education making the most of the 21<sup>st</sup> century and the technologies available? Have education teams realised its potential for CEPA?

Rank	Information on line	Number	Percentage
1	Programme description	70	63
2	Booking info	67	60
3	Info on plants	54	49
4	Conservation info	39	35
5	Teacher resources	24	22

6	Activities for children	19	17
7	No website	13	12
8	Nothing on education	9	8

### **What types of information do botanic gardens have on the internet and what are the most common?**

The most common information for people to have on the website is programme descriptions and booking information

If 88% of gardens do have a website, whether hosted themselves or by their governing body, it demonstrates that this resource is massively under-utilised by education departments. The internet is still undergoing massive growth and is used on a regular basis by a huge number of people, in developed and developing countries. As communicators, educators should not be lagging behind in this area. As well as helping to advertise events and programme, a website can be seen as another form of interpretation – one with a potential audience of 1.14 billion (<http://www.internetworldstats.com/stats.htm>), there aren't many panels that could reach that many!

The 'new media' revolution, with video sites such as YouTube and methods such as blogs and podcasts, mean that botanic gardens can communicate their message to audiences without them even setting foot inside the garden. At the most basic level, providing information on-line for users, to read before they reach the site increases the accessibility (Price and Stoneham, 2001).

### **Where are the gaps?**

There are gaps throughout the education provision on the website – at the least, gardens should have programme descriptions, booking details and some of the messages about plants and conservation on their site (depending on their education strategy of course). Resources for teachers are also useful again for orientation but also for follow-up work back at school.

## **Conclusions**

This research has uncovered a number of salient points for educators and gardens considering their education provision

- Gardens feel education is important
- Investment may be lacking in some areas
- Education is virtually a garden-wide deliverable
- The audiences reached, the themes communicated and the methods used are very varied
- Some additional opportunities for development can be identified
- Much good work is happening in the fields of networking and evaluation – building on this could be beneficial
- Exciting opportunities can be afforded to educators by the internet
- Within their programmes, garden are contributing directly to Target 14 of the Global Strategy for Plant Conservation

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