Congress Theme

Climate change and environmental action

Understanding climate change: a course for children based on writing a story

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Introduction

Climate change is a complex problem which can be tackled in an original way by botanical gardens.

In October 2008, a course for children on this subject was organised at the Montet Botanical Gardens (the Nancy Gardens' main site). This week of activities was intended to make the children (who were 11 years old and above) aware of the potential effects that disruptions in climate can have on plants.

To help them reflect on the possible effects of these disruptions, the children designed and produced an illustrated story. The written piece in effect enabled issues linked to biodiversity to be approached in a different way, while also developing the creativity skills of the youngest children.

Educational activities of the Botanical Gardens

The Botanical Gardens

The Botanical Gardens in Nancy were created in 1758. Due to a lack of space in the original garden, the collections were transferred to another site on the outskirts of town (Le Montet).

Today, the site is made up of a park of 35 hectares in size and 2,300m^2 of tropical glasshouses. An alpine garden in the Vosges Mountains is also associated with the Gardens. More than 12,000 species are grown on site, with the majority of them found in the tropical glasshouses.

Each year, the Gardens welcome around 70,000 visitors, including 4,000 school children.

The education department

The Botanical Gardens in Nancy have an education department comprising four people with students making up the remainder of the team in order to offer activities and guided tours to visitors.

The educational activities on offer are diverse and include temporary exhibitions, seminars, guided tours or discovery get-togethers for school children, educational days, drawing and gardening courses for adults, participation in national events (Science Festival, Sustainable Development Week), etc. Different activities aimed at a young audience are also regularly organised during school holidays: these include 'Green Workshops' and themed courses.

Activities based around stories and books

For a number of years, the Gardens have also produced educational publications in order to increase children's awareness about the world of plants. Botanical detective stories and tales have been published by the institution. Books are actually interesting and original learning aids which enable scientific ideas to be approached through the use of imagination.

After visiting a themed exhibition, each class can then be provided with a book to enable them to continue the work at school. This learning aid also enables participation in events such as 'Livre sur la Place', a large literary event which takes place every year in Nancy.

Aims of the course on climate change

The aim of the "Green Workshops" educational courses is to improve knowledge in a subject related to the plant world and sustainable development. This is done over the course of a week using a fun and interesting approach. The idea is for the children to learn and to understand, but above all become more aware of an issue, whilst having a fun week. These courses have proved very popular and are usually booked up, with some children returning regularly.

For the week, the objectives were:

- to understand the causes and consequences of climate change
- to better understand the living conditions of plants

and also:

- to develop creativity and imagination
- to have a fun, rewarding week
- to share ideas with other children through organising a joint project
- to develop curiosity and reflection about the living world.

Description of activities

The course takes place over five half-days with each half-day session lasting two hours. After different workshops about the theme, the children designed and produced an illustrated story. The idea of combining the writing of a story with a more classic educational approach enabled the children to better understand the possible effects of climate change on plants. An educational booklet was also handed out to every child.

Children from the age of 11 upwards attended – we decided that this age enabled us enough time to treat the subject matter in a sufficiently clear way and also gave the children time in one week to complete their project.

Treatment of the issue

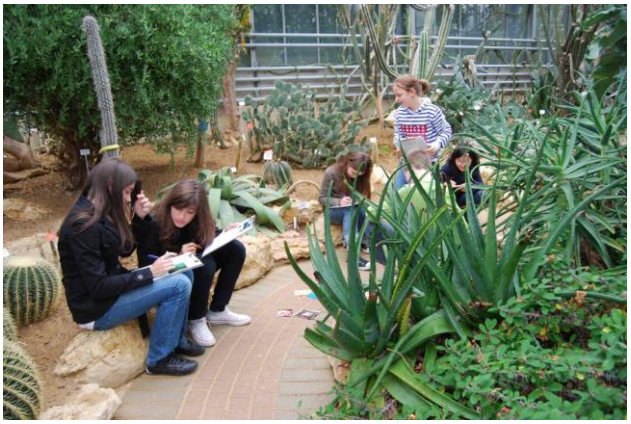
First of all, the children visited an exhibition about the greenhouse effect. A discussion then took place which helped them to better understand the causes of this phenomenon and its consequences. It was simply a question of making the connection between human activity and changes in climate.

In small groups, the children also worked on stories which mention research about the consequences of climate change on plants such as the migration of plants that grow at altitude, the risk of agricultural loss in certain regions, the risk of certain plants disappearing, the spread of pests, etc. Then, during a visit to the tropical glasshouses, they found out about plants and their living conditions. Actual examples of threatened plants were shown to them. The children were as such able to think about possible solutions and practicable things which could be carried out in order to limit our consumption of carbon and enable us to be responsible eco-citizens.

In effect, it is not just a question of alarming children but of increasing their awareness of the problem while showing them that we can act by adopting responsible behaviour.

Preparation of the story

In the second part of the course, the children prepared a story. They played different writing games in order to develop their creativity, find ideas and practice expressing themselves in this way. Several small individual writing exercises enabled them to develop and practice writing in a fun way, which helped them dare to write in a very different context to the way they do in the school environment. Then they made up a



Writing workshop in the greenhouses

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story together about the plants they had chosen. They made up a character which allowed them to build up the main thread of their story: a droplet of water which was becoming smaller and smaller during the course of its journey to meet different plants.

Rather than giving them definite answers about an uncertain future, they thought about the different threats than could affect their chosen plant, which was taken from different habitats (aquatic, island environment, mountain, desert, forest, etc) and they imagined what could happen to it if we don't act immediately to help it.

Choosing their own plant meant they learnt more about it and as such they were more concerned about the idea of seeing it disappear one day. Finally, they illustrated their story by drawing their chosen plant. In this way, they created the story *Blue the droplet and climate change*.

Conclusion

By combining literary and scientific approaches, botany as a subject can be tackled in a different way. The age of the children and the duration of the course didn't allow the subject, which can be complex, to be treated in any real depth but it did increase the children's awareness of the issue. The scientific ideas discussed obviously remained limited, but the children have great enthusiasm. The Botanical Gardens were successful in their intention to increase awareness about threats to biodiversity.

The children with their production

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The Nancy Botanical Gardens are also now working on a new education project, which will also have scientific and cultural aspects. It will enable the Garden to optimise their educational and scientific activities, better evaluate the relevance of its activities, and direct their future projects in order to fully respond to the issues confronting botanical gardens today.

A garden for a changing climate: the SA Water Mediterranean Garden

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Abstract

The SA Water Mediterranean Garden has been designed to encourage visitors to consider the nature and value of living in a mediterranean environment, particularly in relation to water. While the Garden ultimately encourages people to plan and grow more sustainable gardens, it embeds this learning more broadly by exploring the cultural and environmental connections between people, landscape and water-wise horticultural practice.

A multi-layered interpretive approach incorporating traditional and new media has been used. Various layers of interpretive messaging are designed to appeal to emotional, informational and kinaesthetic learners and to people seeking a little or a lot of information.

Amongst other findings, research shows that South Australians are well aware of the Garden before they visiting it. One of the reasons for visiting is to find out about water-wise gardening; visitors find it an interesting and useful place to learn about saving water at home. More than half of all visitors surveyed said that they would make some changes at home as a result of their visit and 86% would recommend the Garden to friends.

Introduction

Adelaide, South Australia, has a mediterranean climate: hot, dry summers and mild, wet winters. Climate models predict that Adelaide will become hotter and drier, with more frequent droughts. Water will become increasingly scarce.

The local water authority, SA Water, and the Botanic Gardens of Adelaide share a vision of changing the community's ways of gardening and using water. By modelling sustainable horticultural practices, the SA Water Mediterranean Garden reinforces, through education and a multi-layered interpretative approach, the fact that, with careful plant selection, mulching and inline dripper systems, only small amounts of water are needed to produce a spectacular display.

As South Australians seek to balance their need for an attractive urban landscape with the scarcity of water, the SA Water Mediterranean Garden inspires, encourages and demonstrates how to create beautiful sustainable gardens that use little water and are free of weedy species.

The Design

Working in consultation with renowned South Australian architects Taylor, Cullity Lethlean, the Botanic Gardens of Adelaide's horticultural and education team developed an interpreted garden to display a range of plants species from mediterranean regions of the world. Modelling efficient water application and conservation technology, the Garden has proven that beautiful gardens can be established and sustainable plant growth can be achieved with minimal water use. With over 140 species planted from across the world's five mediterranean zones, the SA Water Mediterranean Garden is an exemplary water-wise demonstration garden. It is designed to offer practical and achievable home garden options while achieving valuable horticultural and educational outcomes.

Interpretation Objectives

The SA Water Mediterranean Garden is primarily a landscape for educational. There are a number of learning, emotional, attitudinal and behavioural objectives that are embedded in the design and interpretation of the Garden.

Visitors learn that:

- Adelaide has a mediterranean climate and what that means
- there are a variety of plants from other mediterranean regions that are highly suitable for Adelaide conditions
- they can make changes in their own gardens to make them more sustainable
- some mediterranean plants may have the potential to become weeds in South Australia, which can threaten our biodiversity
- mediterranean plants have a high conservation value.

Visitors will feel:

- curious about the plants, people and culture of the mediterranean regions
- concerned about the pressure we place on our resources
- excited about the possibilities for mediterranean plants in South Australian landscapes
- inspired to make a change to their own gardens

Visitors will:

- consider planting mediterranean plants in their gardens
- make water-wise plant choices
- check whether their chosen plants could become weeds before planting.

The SA Water Mediterranean Garden has as its primary interpretive theme: mediterranean plants are highly suitable for Adelaide conditions, and can help South Australians create gardens that use water efficiently, in ways suited to our natural landscape. A number of sub-themes sit under this:

- ***Plants*** - that people, culture and plants are inextricably linked.
- ***Ephemeral Water*** - that water is ephemeral in a mediterranean climate.
- ***Fire*** - that fire is a driving force for plants in a mediterranean climate
- ***Endangerment*** - that mediterranean plants are diverse and endangered

Interpretive Technique

A number of interpretive tools are used to engage with visitors. Interactive signage uses a layered approach to engage visitors with varying learning styles, while providing for emotional and cognitive experiences at different levels. An information brochure highlights specific sites within the Garden that illustrate key interpretive messages. Garden guides run daily tours, an MP3 audio trail is available from the nearby Visitor

Information Centre and from the Botanic Gardens of Adelaide website. Formal seminars/workshops for the public and for industry groups are delivered on sustainable and water-wise horticultural practice, using the SA Water Mediterranean Garden as a model for sustainable gardens. Special events, such as National Water Week and National Biodiversity Month, are celebrated in the Garden with community events for families. A number of formal school programmes have been developed, enabling schools to participate in self-guided or led programmes. Teacher professional-development sessions are also provided for schools.

Results

Results from the Gardens' 2008 SA Water Mediterranean Garden visitor engagement survey, conducted in partnership with the University of South Australia, provides further evidence of the success of the Garden as:

- 43% of visitors intend to visit the SA Water Mediterranean Garden
- 25% stayed for 60-90 minutes
- 46% intend to revisit the SA Water Mediterranean Garden
- 86% would recommend it; and
- 53% intend to make changes at home.

Climate change panel discussion: introduction

Donavan Fullard

South African National Biodiversity Institute, South Africa

As you know, Africa is one of the regions least responsible for climate change, yet it is the most affected and is also the least able to afford the costs of adaptation. Just as important as mitigation is, adapting to climate change must now become a priority. Although mitigation reduces the future cost of adaptation, it will never be an either/or situation and our adaptation response is critical.

Albert Einstein once said that in the heart of difficulty lies opportunity. It is only in the context of severe challenges that the human mind is at its most creative, when it realises the limitations of continuing on the path that has created the difficulty in the first place, that the search for a new approach begins in earnest. This is the moment when human beings engage in struggle to find the opportunity in the heart of difficulty.

It is in pursuit of opportunity, of a new approach, of creative and sustainable solutions that I want to make my contribution.

The question we may ask: What does climate change have to do with Africa and what does it have to do with fighting poverty? According to a report by a Nigerian scientist, Anthony Nyong, an additional 100 million people will go hungry by the year 2050 as a result of rising temperatures and lower rainfall. Africa is one of the most vulnerable continents to climate variability and change because of multiple stresses and low adaptive capacity. Certain regions, especially in southern Africa, are at risk from increasing water stress which will have significant impacts on livelihoods of people in all sectors of society but more particularly the poor. The number of people exposed to water stress will multiply and it is projected that by 2020, between 75 million and 250 million people will be exposed to increased water stress due to climate change.

From our vantage point, the developmental interests of the African continent will be foremost at the Copenhagen meeting later in the year. The Copenhagen agreement would therefore need to address, in a fair, effective and inclusive way, the four building blocks of a future climate regime:

- adaptation to a changing climate;
- mitigation of greenhouse gas emissions;
- transfer of climate-friendly technology; and
- financing of all these measures.

Yet we must realise that we are currently in another global crisis – the global economic crisis. As with climate change, this is largely a crisis that is not of our making, but one which, like climate change, will affect us all, and the poor most. Acting now on climate change presents the best possibility to overcome the challenges of the global economic crisis through investment in pro-poor, job creating and sustainable "green growth".

If the world community does not take decisive action soon, it is the poorest that will be hardest hit. Poor communities are the innocent bystanders – they have contributed least to the problem, but will bear the brunt of its devastating impact.

The experience and perspectives of Africa are central to our deliberations today. The Congo Basin is home to one of the two remaining forest 'lungs' in the world with the capability to absorb large amounts of

greenhouse gasses. The importance of nature and environment in our region reinforces the importance that we place on nature, environment and the land. In order to emphasise this point I wish to quote from the first African woman to receive the Nobel Peace Prize, Wangari Mathai:

> *"For many years I have asked myself, 'What can I do for the Earth?' I want to inspire others to ask that question, and answer it wherever and whenever they can. My experience has taught me that individual efforts do matter. However, unless there is political will and public support around the world, the enormous benefits the environment bestows on us will be lost. Future generations will pay the price. "*

For South Africa, the climate change challenge is therefore not only one of climate stabilisation, but it is ultimately also about combating poverty, livelihoods, energy security and sustainable development.

We must act. We owe it to millions of people who will be directly affected: small scale farmers who have to deal with greater climate uncertainty; small exporters and large industries that have to meet the requirements of the markets which are carbon-sensitive.

Dealing with climate change requires a coherent and co-ordinated action involving both developed and developing countries under the leadership of the United Nations.

So, do our botanical gardens have a role to play, I say YES!! I do not have the answers to the questions, but it is discussion forums like these, where we can debate and deliberate issues and enrich our experiences through sharing and learning from others – to get our messages across. I think that Education in botanic gardens has a great role to play and responsibility, specifically in our context here in South Africa, to educate the nation about climate change, biodiversity conservation, sustainable living, etc. – especially the future leaders of tomorrow – the kids.

How do we as SANBI steer our communities to action?

By developing capacity through awareness and education programmes – our Outreach Greening programme, garden-based schools programme and teacher development workshops.

Through our garden-based programmes, thousands of learners attend our structured programmes: they focus on climate change, sustainable use of resources, biodiversity, etc.; we attempt to increase the knowledge base of learners – talk about their ecological footprint and introduce them to handprint activities (which is focusing on positive stories and ways of saving our planet through living sustainably).

Our teacher professional development programme aims to strengthen teachers' capacity to respond to the challenges of teaching and learning in a complex environment. We offer workshops to them dealing with the topics of climate change and biodiversity, sustainable development; this involves building teachers' knowledge as well as showing them how to incorporate this knowledge into their teaching practice.

Through our outreach greening programme we encourage communities to plant water-wise indigenous gardens and trees in their schools, their houses and in urban and rural open spaces. Through skills training programmes and workshops, we develop their capacity to live more sustainably.

I am looking forward to this discussion and hope that we can learn from one another. If I were in the USA I would have quoted a famous slogan "Yes, we CAN", but I am a proud South African and I would like to quote my government's slogan which says: *"Working together, we can do more."*

Siyabonga (Thank you.)