ROOTS

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THE 11TH INTERNATIONAL CONGRESS ON EDUCATION IN BOTANIC GARDENS

BOTANIC GARDENS CONSERVATION INTERNATIONAL

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Cover image: Delegates of the 11th ICEBG congress are walking through Korea National Arboretum (Korea National Arboretum).

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FIRST WORD

ARTICLES

REGULARS

FIRST WORD

CONGRESS OVERVIEW

Annelies Andringa-Davis
Education and Training Officer

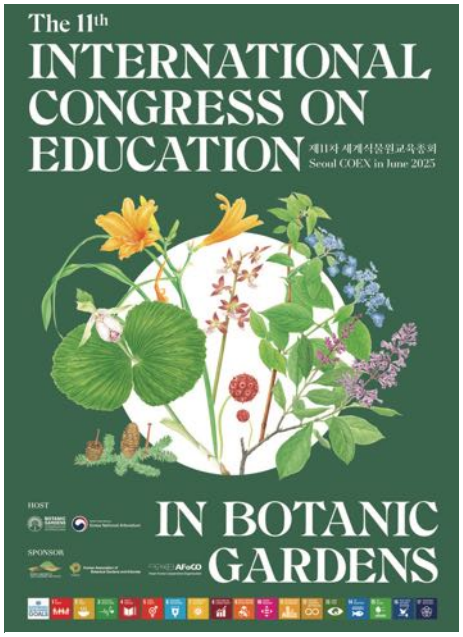
The 11th International Congress on Education in Botanic Gardens broke participant records by welcoming 1,736 visitors from 53 countries. We hope you were there as well, but if not, this issue of Roots will give you an overview of some of the Congress highlights, insights and inspirations.

Hosted by Korea National Arboretum (KNA), Korea Arboreta and Gardens Institute (KoAGI) and BGCI, the Congress explored how education in botanic gardens can address some of today's urgent global challenges - biodiversity loss and climate change, while strengthening community engagement and inclusion. Through five dynamic days of presentations, workshops, panel discussions, and excursions participants shared inspiring stories from all over the globe. The Congress opening plenary was from Professor Jae Chun Choe (Ewha Women University and President of the Biodiversity Foundation Korea) who talked about the roles of botanic gardens in the age of climate crisis. He was followed by Shahbaz Khan, Director of UNESCO Regional Office for East Asia who shared some fascinating insights on how gardens can link their activities to the UN Sustainable Development Goals.

Finally on day one, the first of five keynote speakers addressing the themes of the Congress was Professor Youmi Lee (Korea National University of Cultural Heritage) who spoke about the role of gardens for learning and wellbeing as part of the *Enhancing health and wellbeing: Value of botanic gardens theme*. At the start of day two we listened to Vivian Malema, Director for Education and Empowerment of SANBI in South Africa who explored the theme *Breaking down silo's: Building individual partnerships*. She reminded us that "When parents are better equipped than the children, it's a sign of regression". In the afternoon of day two the delegates were taken on a fantastic excursion to the Korea National Arboretum, where delegates were treated to a special Korean lunch and were able to enjoy tours of the garden and indoor exhibits. To close day two, a wonderful Congress dinner was put on by the hosts, which included a performance by the Saengdonggam-Crew.

Day three was packed with inspiration. Lujing Chen from China, founder of media platform *Yi Fang Jian Di* showed some of her videos from her series "One plant a day" that demonstrated the impact of her role as a plant conservation influencer as part of the theme *Harnessing the power of technology: Learning and engagement for all*, see also her best watched video to which she added English subtitles (https://www.bilibili.com/video/BV1fZaSzBEMX/). She was followed by Ingrid Sanchez Tapia (Global lead on Climate & Education of UNICEF; CEO of Planetwise Development) who spotlighted youth programmes in four botanic gardens as part of the theme *Empowering youth voices: Youth as key stakeholders in climate action*. The key take-away from her talk was to always listen to the voices of the youth, and embed youth leadership within our programmes.

On day four, Farmer Tantoh, Founder of Save Your Future Association in Cameroon shared details of his award-winning programme as part of the theme *Leaving no one behind: Promoting equity, inclusion, and community engagement in botanic gardens*. His important message was "From small things, big things grow."



Official 11th ICEBG poster

Delegates participating in one of the many workshops (Korea National Arboretum)

The Saengdonggam-Crew

Following the keynotes each day was a diverse and inspiring programme of sessions from Congress delegates. With up to six concurrent sessions running at any one time, covering a wide range of education topics and offering a variety of formal and interactive session types there was something for everyone.

The Congress concluded with a very special excursion to the DMZ (Demilitarized Zone) Botanic Garden, located on the border with North and South Korea. Delegates had a glimpse into North Korea, from the Eulji Observatory, admired the garden, and ended the week with a moving concert by seven musicians who provided a mixture of classics and traditional songs.

We extend our warmest thanks to everyone who attended, and especially to our incredible hosts, Korea National Arboretum (KNA) and Korea Arboreta and Gardens Institute (KOAGI) for their exceptional organisation, warm hospitality, and dedication in making the 11th ICEBG such a huge success! For more info https://www.bgci.org/resources/bgci-tools-and-resources/11th-international-congress-on-education-in-botanic-gardens-resources/

This issue of Roots opens with a summary of the Congress Statement that was shared at the closing of the event, and included the announcement of a yearly Education Day on June 12 on page 5. Tara Moreau shares her insights on the importance of educational congresses, having been a participant of BGCI's events since 2015 (page 8).

Helen Miller from BGCI launches the Declaration of Intent on Climate Action, co-developed during two workshops in the Congress on page 11.

On page 13, bursary participant Isai Olalde describes his positive experience at the Congress and highlights his work on integrating Mayan etnobiology.

Under the theme *Breaking down silos*, Meise Botanic Garden illustrates how positive imagination can address global and complex issues, while Vytauta Botanic Garden demonstrates the vital role of learning within a botanic garden on pages 16 and 19.

Naples Botanical Garden, together with Korea Rural Network showcases how to empower youth voices in a special workshop session with Korean middle school students (page 22). On page 25, KoAGI presents their education programme for Korean schools on aquatic plant diversity and its innovative seed barcode programme.

The theme *Human health and wellbeing* is explored on page 28 in a joint article from Kadoorie Farm and Botanic Garden and Singapore Botanic Garden who gave a workshop about the power of tree energy. Read on page 31 about a session that explored the ongoing war in Ukraine.

On page 37, read about KNA and UNESCO's co-hosted meeting that brought together botanic gardens from China, Mongolia, Japan and South Korea to exchange approaches on education for sustainability.

Finally, we close with personal experiences from delegates all over the world – participants from Uganda, Argentina, China and the Netherlands reflect on their Congress experiences (page 37).

We hope the issue provides a good overview of the activities of the 11th ICEBG and demonstrates why these international Congresses have such an important role to play in bringing global education professionals together to share and build a stronger

Group picture during the visit to the Eulji Observatory on the border with North and South Korea (Korea National Arboretum)

Adriana Burgos and Harriet Kokugonza enjoying the view at the Demilitarized Zone Botanic Garden (Korea National Arboretum)

Authors: Youngsuk Im, Soon-ok Oh, Songhie Jung and Kaesun Chang

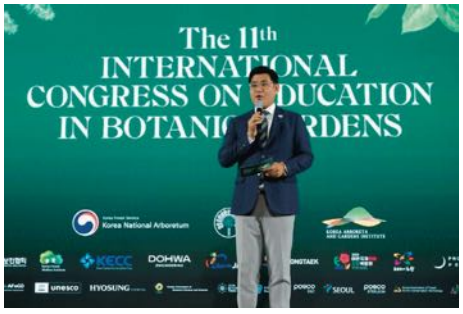
A NEW BEGINNING FOR GLOBAL BOTANICAL SOLIDARITY: THE ICEBG STATEMENT

The 11th ICEBG, held in Seoul in June 2025, brought together participants from 53 countries to address global challenges through botanic garden education. Its key achievement was the announcement of the ICEBG Statement, which confirms botanic gardens as centres of healing, education, action, and solidarity, with six priority areas spanning climate action, mental health, conservation, and inclusive partnerships. Korea will lead follow-up initiatives in citizen science, seed conservation, and community-based education, while encouraging global collaboration to realize its vision.

In June, the 11th International Congress on Education in Botanic Gardens (ICEBG) took place at COEX in Seoul. Under the theme "Education for Change: The Role of Botanic Gardens in Addressing Global Challenges", educators, botanic garden professionals and researchers from around the world gathered to explore some of humanity's most pressing issues—climate change, biodiversity loss, mental health, community engagement, and youth participation.

The Congress featured 141 presentations, 45 workshops, 17 exhibition booths, and several field trips, showing how education in botanic gardens is moving beyond discussion to tangible, practical change. Its most significant achievement was the formal ananouncement of the ICEBG Statement, a shared declaration of commitment to collective action.

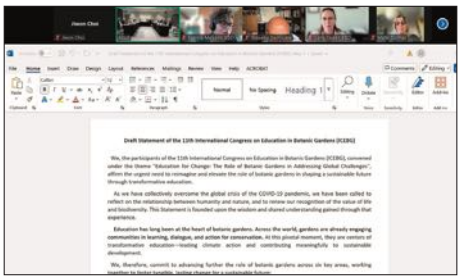
In total, 1,736 participants attended, with representatives from some of the largest botanic gardens in the world, as well as those in biodiversity hotspots. As the largest gathering in ICEBG's history, the Congress signaled new possibilities for international collaboration and solidarity.



Above: Youngsuk Im, Director-General of Korea National Arboretum, introducing the background of the Statement
Top: Delegates listening to the announcement of the Statement at the Closing Ceremony
(Korea National Arboretum)

The ICEBG Statement, prepared by KNA, was approved by BGCI's International Advisory Council prior to the Congress. The statement is a shared vision for the global botanic garden community.

On 12 June, the Statement was formally announced at the Congress' closing ceremony, with 12 June designated each year as the International Day of Education in Botanic Gardens.



International Advisory Council (IAC) endorsing the Statement (Korea National Arboretum)

What the Statement means

The Statement emphasises the role of botanic gardens as centres of healing, education, action, and solidarity. It sets out six priority areas.

Nature-Based Therapy and Climate Action in the Age of Climate Crisis

Botanic gardens are sanctuaries of care and healing, offering vital support for mental well-being. We are committed to restoring the human-nature connection and fostering ecological sensitivity.

1. With a growing understanding of eco-anxiety, we will strengthen garden therapy and educational programmes in botanic gardens that support mental health and wellbeing.

2. We will actively support youth-led initiatives, citizen science programs, professional training programmes, and collaborative projects that empower the next generation as climate action leaders.

3. We will develop and deliver education programmes that support local climate action and contribute to climate goals.

This recognises that the climate crisis is not merely an environmental issue, but one that directly affects our daily lives and peace of mind. Botanic gardens must become spaces where people reconnect with nature through garden therapy, meditation, and ecological learning, and where youth and citizens alike grow into active leaders in responding to the climate emergency.

Integrating Conservation Technologies, Resources, and Knowledge: Building Interdisciplinary Educational Partnerships

We share a vision of an integrated educational framework founded on collaboration across diverse disciplines—including botany, climate science, psychology, pedagogy, and others. We are committed to creating interdisciplinary partnerships that advance and expand conservation knowledge and resources.

4. We will support the wider expanding role of botanic gardens by delivering education grounded in evidence-based science to support ex-*situ* conservation and species restoration.

5. We will strengthen partnerships with local communities to promote governance-based conservation and educational initiatives.

6. We will champion inclusive education practices that value Indigenous knowledge and the experiences of communities—especially in underrepresented regions and marginalized peoples—to enhance access to biodiversity education and conservation by strengthening global networks and supporting educational systems.

This reflects an expanded role for botanic gardens as hubs of knowledge and practice that embrace scientific research, community participation, and Indigenous knowledge. Conservation and restoration education must be rooted in science but cannot be sustained without active engagement from local communities. Above all, education must remain accessible to all, ensuring that no one is excluded from learning and conservation.

This shared commitment contributes to the achievement of the 2030 Global Biodiversity Framework and the Global Strategy for Plant Conservation. The designation of 12 June as the International Day of Education in Botanic Gardens symbolises a global solidarity and a collective commitment to action.

The way forward

The Statement is not an endpoint but a beginning. Concrete actions must follow. Building on the Statement, Korea is preparing a range of follow-up initiatives.

First, we will strengthen learning networks and expand citizen science. A global database of botanic garden education programmes will be established, enabling reciprocal learning and regular joint events. In cooperation with UNESCO, biodiversity education initiatives will also be extended to regions such as Mongolia.

Species conservation and technology sharing are also critical. Education programmes on seed conservation will be developed around the Baekdudaegan Global Seed Vault (BGSV), alongside training opportunities to build capacity among scientists from developing countries.

Finally, collaboration with local communities will be deepened. Programmes such as the “Arboretum Education for Upper Elementary Grades” will link with formal education to build climate resilience and raise public awareness of biodiversity conservation. Through these efforts, Korea aims to put the spirit of the Statement into practice on the ground.

In closing

This Statement is not however owned by Korea alone. It’s true significance lies in how each country interprets it within its own reality, and how we act together.

The inaugural International Day of Education in Botanic Gardens, to be observed on 12 June 2026, will serve as the first test. Each country will be able to mark the day in ways that fit their own contexts—whether through citizen science projects, youth-led international forums, or community-based celebrations.

This day is not intended to follow a single model. It is a day of solidarity, shaped by the diverse participation of the global botanic garden community. Only through this diversity will the day acquire its true meaning. And in this very process, we will be realising the vision of the Statement: Education for Change.

International Advisory Council (IAC) endorsing the Statement (Korea National Arboretum)

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BOTANIC GARDEN EDUCATORS: BRINGING FORWARD A FUTURE WE WANT

Sharing reflections from the last three Congresses on Education in Botanic Garden

The future we want becomes clearer after a week spent with botanical garden educators. A future where our children, youth and all members of our communities have access to peace, wellbeing and the health benefits of nature. Achieving this future requires collaboration across gardens, countries, and differences.

I have been fortunate to attend the last three International Congresses on Education in Botanic Gardens (ICEBG), including Missouri, US (2015), Poland (2018) and the recent gathering in South Korea. Over the past ten years, I have come to see botanical garden educators as true leaders in nature-based learning. They bring the vision that inspires and the courage to implement it, and they are incredibly generous with their knowledge and advice. They are helping to scale action from local to global levels by sharing practical advice, from 'what not to do' to innovative solutions for garden-based programming.

Above: Congress session at the 11th ICEBG working together to learn and build capacity for the Kunming-Montreal Global Biodiversity Framework (UBC Botanical Garden)

Botanical gardens are critical hubs of community engagement and activation.

Lee Coykendall from US Botanic Garden sharing her approach to education (UBC Botanical Garden)

The impact of these learning congresses on my work at UBC Botanical Garden has been tremendous and the network of colleagues invaluable to my own learning journey. The 9th ICEBG in St. Louis, Missouri (2015) was the first botanical garden Congress I attended. I was new to the garden community, having come from the agriculture and sustainable food world, and I was immediately inspired by the warmth, passion, and quality of educational programming across gardens. The theme of this congress was *Biodiversity for a Better World* and I came home with a clear focus on increasing the use of and public exposure to the word biodiversity. I also saw educational signage, weather stations and interactive sustainability displays at the Missouri Botanical Garden that struck me as something I wanted to bring back to UBC Botanical Garden.

In 2018, 300 delegates from 48 countries gathered in Warsaw, Poland for the 10th ICEBG. Much of this event took place at the University of Warsaw Botanic Garden, which was celebrating its 200th anniversary – an important sign of resiliency and a source of optimism. Written across my final conference notes was '*the power of yes and us*,' which reflects the hopeful tone and empowered energy these gatherings often foster. Something that always stuck with me from this Congress was a comment by Lee Coykendall (US Botanic Garden) who articulated that "*we must help people fall in love with nature before we ask them to save it*".

The 11th ICEBG in Seoul, South Korea was no exception. The hospitality of our host Garden (Korea National Arboretum), the depth of delegates and the quality of sessions and field trips showcased what the world can look like when we take care of it and each other. From practical programming advice (e.g., 'build in unstructured play' from Britt Patterson-Weber, Naples Botanical Garden), to big picture priorities (e.g., '10 actions for botanical gardens with UNESCO' from Shahbaz Khan, UNESCO), the take-home messages spanned education, outreach, engagement, research and conservation.

Some of the key lessons and takeaways I noted:

- Multiple Crises and Scalable Solutions: Botanical gardens and their teams are working on the critical issues of our time – biodiversity loss, climate impacts, food security, inequality, war and social injustice. As solutions hubs, the role of gardens in sharing best practices and solutions, especially for climate and biodiversity goals, is significant.

Botanic garden educators gather at the BGCI Global Congress in Australia in 2022 to highlight the opportunity to form a global education consortium (UBC Botanical Garden)

Over the past ten years, I have come to see botanical garden educators as true leaders in nature-based learning – they bring the vision that inspires and the courage to implement it, and they are incredibly generous with their knowledge and advice.

Members of the BGCI Education Consortium gather and brainstorm future needs at the 11th ICEBEG (UBC Botanical Garden)

- Gardens as Healing Places: Being in South Korea and seeing areas heavily impacted by conflict reminded me that gardens are healing places and their individual and collective stories offer examples of restoration and hope.

- Communications and Audiences: With over one billion annual visitors, botanical gardens reach a number of key audiences, including youth, Indigenous People, traditional knowledge holders and community groups. Garden educators in particular are communication experts, and their ability to adapt language to different audiences is a critical skill for the future.

- Future Gardens and Global Strategy for Plant Conservation – Many speakers shared emerging technologies (AI, bioinformatics, genetic libraries) and new policies (Global Strategy for Plant Conservation) that garden educators can activate and use in their programming.

Botanical gardens are critical hubs of community engagement and activation. Attending these congresses always fills my cup—with new ideas, examples, contacts, and renewed connections with friends from around the world. I leave each congress inspired to explore how, as individuals and educators, we can shift perspectives and help others become lifelong learners and advocates for biodiversity.

Attending these congresses always fills my cup–with new ideas, new examples and new contacts.

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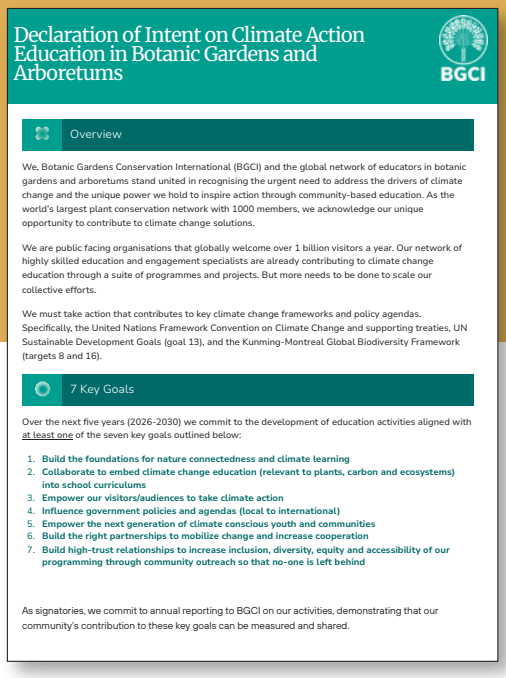
DECLARATION OF INTENT ON CLIMATE ACTION

Delegates brainstorm activities under the seven key goals (BGCI)

At the 11th ICEBG, BGCI convened a series of workshops to co-create a Declaration of Intent of Climate Action. The co-created document is an acknowledgement of our unique opportunity as community to contribute to climate change solutions through engagement activities and action.



Declaration of Intent on Climate Action Education in Botanic Gardens and Arboretums

BGCI

Overview

We, Botanic Gardens Conservation International (BGCI) and the global network of educators in botanic gardens and arboretums stand united in recognising the urgent need to address the drivers of climate change and the unique power we hold to inspire action through community-based education. As the world's largest plant conservation network with 1000 members, we acknowledge our unique opportunity to contribute to climate change solutions.

We are public facing organisations that globally welcome over 1 billion visitors a year. Our network of highly skilled education and engagement specialists are already contributing to climate change education through a suite of programmes and projects. But more needs to be done to scale our collective efforts.

We must take action that contributes to key climate change frameworks and policy agendas. Specifically, the United Nations Framework Convention on Climate Change and supporting treaties, UN Sustainable Development Goals (goal 13), and the Kunming-Montreal Global Biodiversity Framework (targets 8 and 16).

7 Key Goals

Over the next five years (2026-2030) we commit to the development of education activities aligned with at least one of the seven key goals outlined below:

1. **Build the foundations for nature connectedness and climate learning**
2. **Collaborate to embed climate change education (relevant to plants, carbon and ecosystems) into school curriculums**
3. **Empower our visitors/audiences to take climate action**
4. **Influence government policies and agendas (local to international)**
5. **Empower the next generation of climate conscious youth and communities**
6. **Build the right partnerships to mobilize change and increase cooperation**
7. **Build high-trust relationships to increase inclusion, diversity, equity and accessibility of our programming through community outreach so that no-one is left behind**

As signatories, we commit to annual reporting to BGCI on our activities, demonstrating that our community's contribution to these key goals can be measured and shared.

Overview

Botanic garden education and engagement programmes play a pivotal role in delivering climate change solutions, raising awareness of and educating visitors on the impacts of climate change. But is there more that we could be doing? As neutral, safe spaces we often shy away from addressing difficult or political subjects. Our programmes inform, but do they inspire audiences to take action? Can we as gardens play a bigger and more impactful role in the climate conversation?

These questions were the focus of two workshops convened by BGCI at the 11th ICEBG. With funding from the Big Give Green Match fund, BGCI brought delegates together in South Korea to take part in these important conversations. The workshops aimed to co-create a Declaration of Intent around climate action and seek a commitment from our botanic garden community on how we can enhance our contribution to climate solutions in the next five years. From this BGCI has developed a document that outlines this commitment and key goals that our community can contribute to.

Over the next five years (2026–2030) we commit to the development of education activities aligned with at least one of the seven key goals.

Declaration of Intent on Climate Change Education in Botanic Gardens and Arboretums

The Declaration identifies seven key goals that we feel our network can have the biggest impact on to contribute to climate action over the next five years.

These goals are wide ranging and designed to ensure that there is a goal that every organisation can contribute to, regardless of size, location or budget. Some organisations may feel that they are only able to contribute to some, where as others may choose to view the goals as a ladder or progression and work their way across all of them.

The intention is that each organisation commits to contribute to at least one of the seven goals but it is up to each organisation to decide what that commitment looks like and how many goals they can contribute to.

Seven key goals

1. Build the foundations for nature connectedness and climate learning
2. Collaborate to embed climate change education (relevant to plants, carbon and ecosystems) into school curriculums
3. Empower our visitors/audiences to take climate action
4. Influence government policies and agendas (local to international)
5. Empower the next generation of climate conscious youth and communities
6. Build the right partnerships to mobilize change and increase cooperation
7. Build high-trust relationships to increase inclusion, diversity, equity and accessibility of our programming through community outreach so that no-one is left behind.

Next steps

We will be launching our Declaration of Intent on the BGCI website in early 2026 and are asking our members (and wider botanic garden and arboretum community) to sign up to this, committing to develop education activities aligned with at least one of the seven key goals. Sign up can be from an individual, team or whole organisation, with each committment lasting for one calendar year. When signing up individuals will asked to provide some background information on what activities (aligned to each of the seven goals) they are currently undertaking, and be asked to declare which of the seven goals they will commit to contribute to over the next year. At the end of each reporting year, those signed up will be asked to provide a brief report on their activities, and invited to sign up again under one of the key goals. Over the next five years BGCI will provide a suite of training and support tools to further help gardens implement in these seven key areas.

For more information and to sign up to the Declaration visit: https://www.bgci.org/our-work/addressing-global-challenges/public-engagement-education/

Delegates voting on priority goals (BGCI)

Over the next five years BGCI will provide support and training materials to further help gardens implement our Declaration of Intent.

Delegates taking part in the Climate Action workshop (BGCI)

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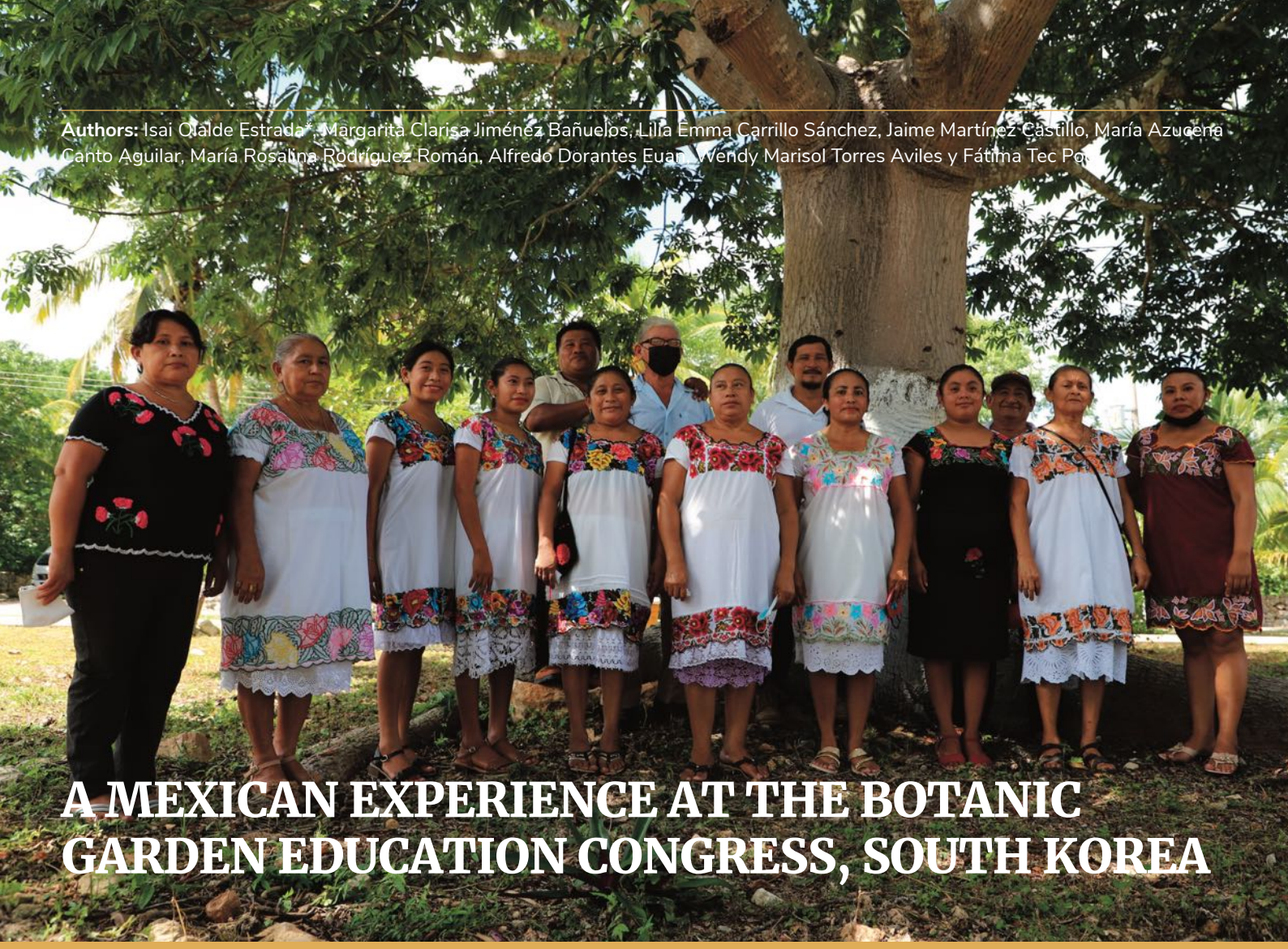

A MEXICAN EXPERIENCE AT THE BOTANIC GARDEN EDUCATION CONGRESS, SOUTH KOREA

Attending the BGCI Education Congress in South Korea enabled me to share our work on biocultural conservation with Mayan communities in Mexico. I gained global insights, exchanged experiences, and was inspired by inclusive, community-based projects. This experience strengthened my commitment to environmental education grounded in justice, diversity, and collaboration.

I had the honour of participating in the 11th International Congress on Education in Botanic Gardens, held in Seoul, South Korea, thanks to the generous financial support provided by BGCI. This experience proved to be deeply enriching on both professional and personal levels, offering me the opportunity to gain insights into the global landscape of botanic garden education, visit the Seoul Botanic Park, engage in knowledge exchange with colleagues from various countries, and present the work we have been developing in Yucatan, Mexico on the conservation of biocultural diversity.

At the Congress, I presented the project titled "Environmental Education and Mayan Ethnobiology: Experiences from the "Roger Orellana" Regional Botanical Garden in Mérida, Yucatán, México", which we consider to be of international relevance due to its focus on global challenges such as the loss of biological and cultural diversity. These issues demand urgent attention, as highlighted by the United Nations Sustainable Development Goals (SDGs), particularly Goal 15 (Life on Land) and Goal 16 (Peace, Justice and Strong Institutions). In Mexico—a country known for its extraordinary biological megadiversity and rich cultural heritage—these topics are especially pertinent. In Yucatán, home of the Maya civilization, we have worked closely with local communities through participatory, community-based initiatives.

Above: Women chefs at the gastronomic exhibition in Yaxché, Valladolid, Yucatán in August 2022 (Isai Olalde)

"No sé si alguna vez les ha pasado a ustedes pero el Jardín Botánico siempre ha tenido una agradable propensión a los sueños"
Mario Benedetti, 1978

As part of this project, we have collaborated with seven communities—most of them Mayan: Acanceh, Xoy, Xocén, Yaxché, Cepeda, and Dzilam de Bravo

Since 2020, the "Roger Orellana" Regional Botanical Garden (JBR-RO) has been an active member of the National Network of Ethnobiological Gardens (RENAJEB) through the project "Strengthening the Ethnobiological Circuit of the JBR-RO", initially funded by the National Council of Science and Technology (CONACYT), now known as SECIHTI (Martínez Castillo et al., 2021). The network seeks to make ethnobiological knowledge and Mexico's biocultural heritage more visible, protected, shared, and disseminated.

As part of this project, we have collaborated with seven communities—most of them Mayan: Acanceh, Xoy, Xocén, Yaxché, Cepeda, and Dzilam de Bravo. Together, we have organized knowledge exchange gatherings, including working groups focused on biocultural topics such as medicinal and edible plants, local legends, and other cultural themes (Jiménez Bañuelos et al. 2023). These efforts aim to produce materials that preserve and promote this valuable knowledge. Additionally, we have hosted gastronomic showcases centred on native and cultivated food plants, highlighting traditional ingredients and preparation techniques that are at risk of being lost. We consider the revitalization of these traditions a priority (Carrillo Sánchez & Jiménez Bañuelos, 2023).

We have supported the strengthening of community and school gardens by providing technical advice and donating plants, with the aim of transforming these spaces into living classrooms or open-air museums. We have also published cookbooks, bird guides, and catalogues of medicinal plants (available at https://www.cicy.mx/jardin-botanico/circuito-etnobiologico) co-authored by members of the communities with whom we collaborate (e. g. Dorantes Euan et al. 2022; Carrillo Sánchez & Jiménez Bañuelos, 2023). In addition, we have produced radio segments in both Spanish and the Mayan language, broadcast via community radio stations and digital platforms such as Spotify. These have allowed us to reach many rural communities in Yucatán, as well as others interested in the biocultural heritage of the Maya.

Above: Residents of the Dzilam de Bravo community participating in a knowledge gathering on biocultural information about their community, June 2024 (Isai Olalde)

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Through these activities, our botanical garden has extended far beyond its physical boundaries, generating significant impact in the conservation of regional biocultural heritage.

At the Congress in South Korea, in addition to sharing the progress and outcomes of our project, I received valuable feedback from international colleagues. It was especially enriching to learn about the diverse methodologies and approaches employed by other botanic gardens, to compare programmes, projects, and institutional priorities, and to participate in hands-on workshops that encouraged reflection and collaboration.

I was particularly inspired by initiatives focused on inclusion, art, and empathy toward nature, which position botanic gardens not only as spaces for learning about horticulture and botany, but also as platforms for artistic expression, introspection, empathy, and social connection—especially with vulnerable groups such as older adults and migrants.

I return to Mexico with renewed energy and ideas to strengthen our educational and community outreach programmes. I am especially motivated to develop more interactive and engaging learning spaces and to promote greater community ownership of the garden. It is truly encouraging to know that peers from other botanic gardens valued and recognized the work we have undertaken over the years.

I also take inspiration from high-impact projects presented at the Congress, such as the Farmer Tantoh initiative, which integrates environmental conservation with the reinforcement of local worldviews and community engagement; the efforts of Meise Botanic Garden and Hantaek Botanical Garden in supporting vulnerable populations; and the Hortus Botanicus Leiden, whose work connects plants and people in urban environments. These and many other initiatives serve as powerful references and motivation to continue our efforts towards building a more sustainable, peaceful, and empathetic world.

This experience has reaffirmed my commitment to an environmental education rooted in social justice, cultural diversity, and community participation. I am deeply grateful to BGCI for supporting my attendance at this international Congress, and I hope this experience will foster new collaborations and transformative projects in our Botanic Garden and with the Mayan communities with whom we work.

Isai Olalde giving his presentation at the congress

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School botanical garden in Xoy, Yucatán, a community collaborating with the Roger Orellana Regional Botanical Garden, October 2022 (Isai Olalde)

Author: Eline Botte

ENGAGING YOUTH WITH GLOBAL CHALLENGES: A MEISE WORKSHOP CASE STUDY

Delegation from Meise Botanic Garden at 11th ICEBG: Valérie Charavel, Marie Despiegelaere, Eline Botte (ICEBG)

At Meise Botanic Garden, we developed a workshop using time-travel, role-play, and interactive activities to engage teenagers with biodiversity, conservation, and global challenges. Presented at the 11th ICEBG, it illustrates how playful, experiential methods complement cognitive learning to reconnect youth with nature and inspire positive futures.

Meeting educators from all around the world. Eline Botte with Fiona Lo from KFGB, Hong Kong (Eline Botte)

Botanic gardens are increasingly recognized as vital spaces for addressing global challenges, from biodiversity loss to climate change. At the 11th ICEBG, themed "Education for Change: The Role of Botanic Gardens in Addressing Global Challenges," I had the opportunity to present a workshop developed at Meise Botanic Garden (Belgium) that directly aligns with this mission: "Botanist Explorers".

I chose to present this topic (two other topics were presented by my colleagues) because research consistently shows that engaging people—especially youth—on complex environmental issues requires a variety of approaches. Cognitive learning alone is often insufficient; affective, playful, and experiential methods are crucial to foster not only understanding but also a deep emotional connection with nature, which in turn shape intentions toward pro-environmental behaviour.

The "Botanist explorers" workshop at Meise Botanic Garden (Meise Botanic Garden)

At Meise Botanic Garden, we combine cognitive exploration, affective engagement, and playful methods —because no single approach is enough to address global challenges.

At Meise Botanic Garden, we designed a workshop with these principles in mind, using time-travel, role-play, and interactive activities to immerse teenagers in the challenges facing plants and ecosystems.

Participants first examine contemporary environmental challenges, including biodiversity loss. Then, through role-play, they are transported back to the 16th century to assume the role of a botanist explorer. Guided by Jeanne Barret, the first woman known to have circumnavigated the globe, students receive their mission: shift the perspectives of explorers on plants—from seeing them as utilitarian resources to recognizing their intrinsic value. By "becoming" historical botanists, students explore a biome in autonomy within our greenhouses. It allows them to experience a specific ecosystem and its biotic and abiotic interactions. Understanding these complex systems is essential: environmental science demonstrates that comprehending the interrelationships between organisms and their environments is fundamental to addressing climate change and biodiversity conservation.

At the end of the role-play, they present their assigned biome and share their discoveries with the other students, highlighting what makes it unique, explaining why the plants there are extraordinary, and persuading others of the need to protect these plants rather than exploit them. This format:

- Reinforces knowledge through presentation and peer learning, where students learn from one another in an engaging and collaborative way;
- Encourages active participation;
- Offers the presenting group a chance to deepen their understanding, as verbally explaining knowledge is one of the highest levels of cognitive processing and significantly improves retention;
- Encourages students to structure and express complex information, stimulating memory and long-term assimilation.

The workshop concludes with a prospective visualization, where teenagers imagine a positive future and propose concrete actions to achieve it. By doing that, we empower them to act creatively and collaboratively, reinforcing their role as active participants in environmental stewardship.

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The “Botanist explorers” workshop at Meise Botanic Garden (Meise Botanic Garden)

Time-travel and role-play empower teenagers to connect personally with plants, shifting perspectives from seeing them as resources to recognizing their intrinsic conservation value.

After one year of implementation, we have observed very positive outcomes, and received enthusiastic feedback from both students and teachers, although some small challenges remain. This case study workshop demonstrates how an integrated, playful, and experiential approach can cultivate knowledge, foster empathy for nature, and inspire youth to imagine and enact positive change.

Sharing this experience at the Congress allowed us to share our approach, exchange experiences with colleagues facing similar questions, reflect on possible solutions together and to learn from colleagues worldwide. Discussions with educators from botanic gardens all over the world revealed both common challenges and innovative practices in engaging youth.

Reflecting on the Congress, I am deeply grateful to have participated in such a large, extraordinarily well-organized event, where the warm welcome and rich programme made the experience truly inspiring. My key takeaway is that effective environmental education in botanic gardens requires both depth and diversity: depth in understanding ecological processes and biodiversity, and diversity in the methods used to engage our public. By combining science, imagination, experiential learning, affective, active and playful approaches, botanic gardens can innovate in ways that are scientifically rigorous, emotionally resonant, socially meaningful without generating paralysing eco-anxiety. Moreover, the Congress reinforced the value of networking and collaboration among botanic gardens to collectively address global challenges.

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THE IMPACT OF LEARNING IN A BOTANICAL GARDEN ON CONCEPTUAL CHANGE

There is a need to highlight the important role of botanical gardens in education through scientific research and to strengthen the collaboration between botanical gardens and educational scientists. This study was conducted to determine whether learning in Vytautas Magnus University Botanical Garden improves students' conceptual understanding of biological concepts.

Studies have shown that learning in botanic gardens contributes to a student's conceptual understanding (Hofstein et al., 2001; Mettis et al., 2023; Sellmann & Bogner, 2013). There is, however, limited research on how learning in botanic gardens affects conceptual understanding among students over the long term. Therefore, there is a need to highlight the important role of botanic gardens in education through scientific research and to strengthen the collaboration between botanic gardens and educational scientists. Presenting this study at the 11th International Congress on Education in Botanic Gardens (ICEBG) allowed us to share our findings and encourage collaboration between botanic garden educators and educational sciences researchers. The purpose of this study was to determine whether learning in botanic gardens improves students' conceptual understanding of biological concepts over time.

Above: Vytautas Magnus University Botanical Garden (VMU BG)

There is a need to highlight the important role of botanic gardens in education through scientific research and to strengthen the collaboration between botanic gardens and educational scientists.

Experimental group lessons in Vytautas Magnus University Botanical Garden (VMU BG)

As part of our study we looked at a total of 79 9th grade students who studied biology at a botanic garden setting through inquiry-based learning, and 72 9th grade students who studied biology in a classroom setting through traditional methods, from two schools. All experimental group lessons took place in Vytautas Magnus University Botanical Garden (VMU BG). VMU BG in Kaunas, Lithuania, occupies an area of 62.5 ha close to the city centre. Featuring botanical expositions and collections, a greenhouse, and a landscaped park with an interesting pond system, the facility serves not only as a place for plant conservation and research, but also as an educational and community centre. VMU BG conducts a variety of educational activities and engages the public in informal education through interactive programmes.

The experimental group lessons at VMU BG were conducted as follows: the first lesson took place outdoor and was devoted to micro-level conceptual understanding. The students were divided into groups, and each group received a plant or an animal cell model. As part of the explanation process, participants were encouraged to present an opposing viewpoint and to refute previous findings, for instance to refute the idea that respiration is not taking place in plant cells and provide an explanation. In another task, students used microscopes to study the samples - they discussed what they saw under the microscopes in groups and drew what they saw. A reflection game concluded the first lesson.

In contrast to traditional classroom teaching, inquiry-based learning in botanic gardens was found to positively influence the development of correct scientific knowledge.

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VMU BG conducts a variety of educational activities and engages the public in informal education through interactive programmes.

The second lesson was conducted outside and related to meso-level conceptual understanding. Students were divided into groups and asked to discuss what was needed to ensure a plant's survival, followed by an introduction to scientific methods. The different factors (all suggested by students) required for plants to survive were assigned to each of the groups. As a group, they discussed how to design an experiment that could check whether the assigned factor was necessary for the plant to survive. Later, they constructed the experimental conditions using real plants. The third lesson focused on meso-level conceptual understanding and took place indoors in the botanic garden laboratory. As groups, students were asked to memorize their experimental designs and hypotheses and brought plants into the lab to discuss the results and draw conclusions. Next, the students conducted two short experiments, investigating oxygen production, and glucose production and starch conversion. The fourth lesson focused on macro-level conceptual understanding and took place outside in the garden and in the greenhouse. A major goal of the fourth lesson was to use an orienteering game to demonstrate how plants adapt to different environments in terms of performing photosynthesis or respiration.

An inquiry-based teaching approach in a botanic garden has been found to be more efficient than traditional classroom methods in fostering correct scientific knowledge development (Vančugovienė et al., 2024). Through learning activities in a botanical garden, students can also overcome resistant misconceptions about photosynthesis and respiration. Students in the experimental group had less misconceptions and more scientifically correct concepts after the intervention. After three months, students in the experimental group still outperformed those in the traditional classroom. Students in the traditional teaching classroom setting group did not improve after the lessons. The implementation of specially designed lessons in botanic gardens may eventually result in the altering of previously held misconceptions into scientifically accurate concepts. Participation in the ICEBG and the presentation of this study allowed us to inspire other botanic garden educators to foster collaborations with educational sciences researchers willing to demonstrate that activities in botanic gardens could facilitate teaching and learning in a meaningful way. In addition, new collaborations have started which hopefully will lead to new projects and inspiring educational activities thanks to the new connections at the ICEBG.

Above: Orienteering game in Vytautas Magnus University Botanical Garden (VMU BG)
Top: The greenhouse of Vytautas Magnus University Botanical Garden (VMU BG)

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STUDENTS LEADING CHANGE: PLANT EDUCATION ACROSS CONTINENTS

The need for plant education and youth empowerment is universal. Two middle schools in rural communities thousands of miles apart connected through ICEBG and discovered common goals for a future that prioritizes plants.

Hwangdun Middle School is a small rural school located in Gangwon Province, South Korea, with approximately 16 students. For the past four years, the school has been consistently implementing plant-based education through regular classes and extracurricular clubs, focusing on observation, expression, and documentation.

Due to limited infrastructure in rural areas and systemic challenges in integrating sensory-based plant education into Korea's public education system, local partners have played a critical role. A nearby private forest retreat and several social enterprises with strong ties to the local community have actively collaborated with the school. These partners co-designed and implemented customized programs such as forest-based wellness activities, small-scale gardening projects, and IoT-based plant monitoring education.

Above: The authors with Hwangdun Middle School teachers and students at ICEBG (Korea Rural Community Network)

ICEBG provided new perspectives, motivation, and a sense of solidarity with others who are working to bring about educational change through nature-based learning.

D.R.A.G.O.N. Squad students reclaimed school garden space that had been dormant for several years, creating a plant lab accessible to the entire Kindergarten-8th grade school (Em Kless)

One of the school's most notable outcomes is the annual publication of student-created books. Working with a local publishing company, students compiled their impressions and visual responses to plant-related experiences. Some expressed their reflections through poetry or song, while others captured emotions through drawing and illustration.

Another key initiative has been the transformation of an unused lot in front of the school—formerly an informal dumping site—into a garden. Each year, students have reclaimed and cultivated this space, planting herbs, vegetables, and trees in collaboration with local organizations. This hands-on process provided more than experiential learning; it enabled students to witness and contribute to real, tangible changes in their surroundings.

We chose to present this case internationally to highlight how sensory-based nature observation can evolve into personal expression and eventually catalyse physical transformation of space. Additionally, we aimed to emphasize that youth should not be treated merely as beneficiaries in plant education but empowered as active participants. In collaboration with Naples Botanical Garden, we organized a youth-led workshop where students overcame language and cultural barriers and took ownership of the program experience.

Key Insights from ICEBG

ICEBG offered concrete examples of how plant-centred education can be expanded to address emotional, social, and ecological dimensions. One case that resonated deeply with us was the D.R.A.G.O.N. Squad developed at Naples Botanical Garden in the United States (see sidebar). This project demonstrated how public gardens in low-density, rural areas can complement public education by serving as accessible and engaging learning environments.

Through field-based learning in a variety of ecosystems, D.R.A.G.O.N. Squad students engaged not only in observation but also in responsibility-driven action. This strongly echoed our own goals at Hwangdun Middle School and helped validate our approach. Although we have been conducting our work in relative isolation, seeing parallel efforts in similar settings abroad gave us renewed confidence and insight.

Through field-based learning in a variety of ecosystems, D.R.A.G.O.N. Squad students engaged not only in observation but also in responsibility-driven action.

Dedicated Researchers Adventuring for Greener Outdoors Now

The D.R.A.G.O.N. Squad is Naples Botanical Garden's afterschool enrichment program for students at a rural middle school in Immokalee, Florida. Through hands-on projects, games, and field trips to local natural wonders, students learn about the diversity of plants in South Florida, as well as climate change threats, mitigation efforts, and the people who are developing those efforts. At the end of the school year, the program culminates in a student-led community impact project.

We see our students at the end of a long school day; the last thing they want to do is sit still, listen to lectures, and do worksheets. Our approach to D.R.A.G.O.N. Squad curriculum is one that prioritizes fun. Fun makes concepts "sticky" and laughter lightens what can otherwise be heavy content. For ICEBG, we shared some of our most popular D.R.A.G.O.N. Squad games that help review plant terminology and ecosystem basics.

The D.R.A.G.O.N. Squad students learned about Hwangdun Middle School after the Congress and were excited to discover how much they have in common with kids on the other side of the world. Enrichment programs like ours show that when students are given space beyond the classroom, they uncover opportunities to grow, connect, and lead change.

Hwangdun Middle School teachers and students, along with Congress attendees, played D.R.A.G.O.N. Squad games at the ICEBG workshop on botanical education initiatives led by youth (Korea Rural Community Network)

Through workshops and dialogue with international participants, we also encountered a diverse range of plant-based education models—from community gardens and therapeutic plant journaling for low-income youth, to counseling programs and theory learning through interactive games. These examples helped us contextualize our efforts and expand our understanding of what's possible.

Implications for Plant Education in Korea

Korea's public education system remains highly test-oriented, making it difficult to embed sensory-based observation or expressive plant education into the formal curriculum. However, ICEBG offered us a broader perspective by connecting us with educators who maintain their pedagogical integrity despite systemic limitations.

The conference also revealed new possibilities for collaboration within Korea. We realized that plant education need not be confined to schools alone—local enterprises, publishing houses, and botanical gardens can play pivotal roles in youth education.

Ultimately, ICEBG was more than an academic conference for us. It provided new perspectives, motivation, and a sense of solidarity with others who are working to bring about educational change through nature-based learning.

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Hwangdun Middle School students transformed an unused lot in front of the school into a garden in collaboration with local organizations (Korea Rural Community Network)

Author: Jiyun Choi

SEED BARCODES AND AQUATIC PLANT DIVERSITY: KOREA'S CONTRIBUTION TO CONSERVATION EDUCATION

Korea Arboreta and Gardens Institute introduced two workshops at ICEBG; one highlighting seed conservation through the Seed Vault, and another using hands-on education kits on aquatic plants in traditional gardens. Both showcase Korea's commitment to advancing biodiversity education and promoting collaboration among arboreta worldwide.

At the 11th International Congress on Education in Botanic Gardens (ICEBG), two workshops were presented showcasing Korea's innovative practices in plant conservation education. Initiated at the suggestion of the Korea National Arboretum (KNA), these programmes illustrated how arboreta can move beyond display to become centres of learning, participation, and international collaboration.

The first workshop, developed with the Seed Vault at Baekdudaegan National Arboretum, emphasized documenting disappearing wild plants and promoting biodiversity through seed conservation. Participants began with an exploration of the vitality of seeds and their ecological role, then learned principles of propagation and seed biology.

Above: Creating My Own Seed Barcode at ICEBG (KoAGI)

Seed conservation education, which documents and protects disappearing native plants, serves to spread the value of biodiversity.

Learning by Doing Seed Barcode Programme at ICEBG (KoAGI)

The programme unfolded in three sessions. Session 1 introduced seed basics—morphology, traits, and modes of propagation. Session 2 explored long-term preservation, focusing on seed banks and the Seed Vault as safeguards for humanity's future. Session 3 highlighted threatened plants and offered a hands-on activity to create a personal "seed barcode." By transforming abstract concepts into tangible exercises, the programme allowed participants to connect personally with conservation practices.

A key strength of this workshop is its alignment with Korea's national science curriculum, ensuring immediate applicability in schools. For teachers, it provided a model that integrates scientific rigour with experiential learning. For students, it created memorable encounters with biodiversity that extend beyond textbooks and link classroom learning with global environmental issues.

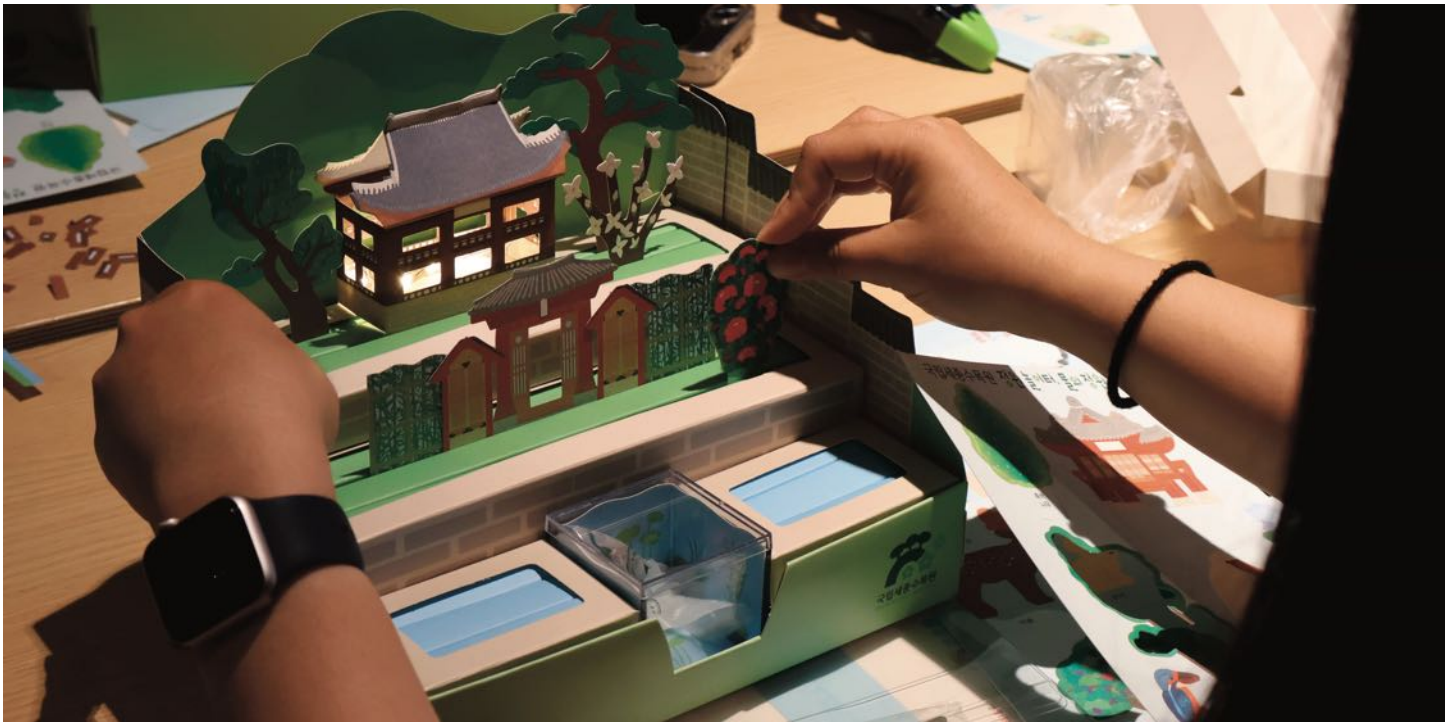
As conservation challenges intensify, the ability of institutions to cooperate across borders will be crucial.

The second workshop drew from the Sejong National Arboretum's education programme, designed to expand access through videos and hands-on kits. At ICEBG, participants tested the kits themselves, experiencing how learners engage with content even without visiting the arboretum in person.

The theme was aquatic plants in Korea's traditional gardens. Beyond plant identification, the workshop introduced cultural, aesthetic, and ecological dimensions of these landscapes. Learners explored the ecological role of aquatic plants and their cultural symbolism, particularly the lotus (*Nelumbo nucifera*). Activities included studying germination and growth conditions for lotus seeds and building a small model pond. These tasks combined scientific observation with cultural storytelling, showing how gardens serve as living laboratories while preserving heritage.

ICEBG workshop led by the Water Garden educator, Sejong National Arboretum (KoAGI)

Together, the two workshops demonstrated that arboreta can act as platforms for conservation education, cultural continuity, and community engagement. Covering themes from global seed preservation to freshwater ecology, they offer a holistic vision of what education in botanic gardens can achieve. They also highlight Korea's distinctive contributions, showing how localized initiatives resonate in international dialogue.



Above and left: A young participant creates a Water Garden and reflects on biodiversity (KoAGI)

Beyond ICEBG, KoAGI is ensuring these programmes have wider reach. Curricula are being shared with public and private arboreta across Korea, enabling adoption and adaptation to local needs. This builds a national network of conservation education that is consistent and collaborative. At the same time, ICEBG provided a platform for international exchange. By sharing these initiatives globally, KoAGI seeks to build partnerships, exchange methods, and address shared challenges in biodiversity education.

Looking forward, KoAGI intends to expand collaboration. International engagement is seen not only as a chance to showcase achievements but also as an opportunity to learn, share resources, and raise the global standard of education in botanic gardens. As conservation challenges intensify, the ability of institutions to cooperate across borders will be crucial.

KoAGI warmly invites institutions interested in these programmes—or broader collaboration and exchange—to get in touch. Whether by adopting the seed-focused curriculum, trialing aquatic plant education kits, or co-developing new initiatives, there is ample scope for partnership. By working together, arboreta and gardens can inspire deeper public engagement with biodiversity, nurture ecological literacy in future generations, and reinforce the shared responsibility of protecting the natural world.

Botanic gardens are increasingly positioning themselves as centres of learning, knowledge exchange, and international collaboration, extending beyond their traditional role in display.

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TREE ENERGY: REDISCOVERING THE HEALING POWER OF NATURE

Connecting with a red pine, ICEBG, Seoul (Bian Tan)

Botanic gardens have a readily accessible yet under-recognized resource: their trees. Trees are an abundant source of intangible energy that can help us be more grounded; make us feel safe and secure; help ignite our latent intuition; and provide ways to de-stress from daily troubles. The perception of such energy can be learned -it is not only for the innately sensitive. There are other ways of knowing, including heart-based and intuitive knowing and the authors present their personal and institutional experiences of the benefits realized by consciously connecting to trees.

"By restoring our bond with trees, we can rekindle a kinship with nature that modern life has lost."
Josephine Woo

In today's fast-paced world, we are increasingly disconnected from nature. Yet the natural world—particularly trees—offers profound wisdom, peace, and healing that many of us have forgotten. For millennia, cultures around the world have revered trees not just as natural resources, but as spiritual beings capable of grounding and restoring us. From ancient temple groves in Asia to sacred forests in Greece and Egypt, our ancestors recognized trees as powerful allies.

Many of us instinctively feel calmer around trees—whether we're enjoying their shade or simply observing leaves rustle in the wind. But what if this sense of peace isn't just psychological? What if trees emit a subtle, energetic presence that we can consciously engage with?

"Perception of nature's energies is not only for the gifted or sensitive; it can be taught, learned, and sharpened through practice."
Bian Tan

A well-loved tree in Taiwan (Claire Elouard)

"At KFBG, we encourage people to connect with trees not just as part of scientific research or for their beauty, but as companions on their journey of self-discovery. These trees offer us more than just ecological benefits—they provide joy, wisdom, stability, and protection."
Josephine Woo

We presented this idea at the International Congress on Education in Botanic Gardens (ICEBG) in Seoul. Instead of trying to prove the existence of "tree energy," we advocated a shift in perception—moving from a purely intellectual view of nature to one rooted in intuition and heart-based connection. This was our message conveyed through sharing our personal experiences: "Conscious engagement with tree energy can help us return to emotional, mental, and spiritual balance."

Kadoorie Farm and Botanic Garden (KFBG) in Hong Kong has long incorporated holistic education in its programme offerings. This includes a spiritual perspective, highlighting the subtle but transformative energy of trees. Such offerings include experiential workshops led by Dr. Claire Elouard. For over fifteen years, she has taught participants how to tune into the subtle energies of trees through grounding exercises, breathing techniques, and opening the spiritual heart. The goal is to cultivate sensitivity to nature's energy and, through it, to our own.

Josephine Woo, Head of Holistic Education at KFBG, describes her connection with an Autumn Maple behind the KFBG's Art House. "Spending time simply observing leaf colour changes and practicing breathing meditation in its presence brings me a sense of deep joy and vitality. My morning ritual not only uplifts me but also inspires me to share that positivity with others."

For Dr. Elouard, walking through a forest is not just a pastime—it's a vital spiritual practice. "I am fully aware of the trees around me and of their energy. They not only deeply recharge my own energy, but also increase my grounding, and my anchoring in the present moment. It's a privilege I deeply value."

Workshop participants often experience shifts in perspective. Bian Tan relates, "I always believed the world possesses a secret, unseen dimension, and now I have been given a roadmap that enables me to chart this unexplored territory. All of nature is now alive with energy that is a form of consciousness. This has precipitated a closer relationship with the natural world, and especially with my beloved companion tree."

Learning to perceive one's own energy, Singapore Botanic Garden (Bian Tan)

People with cancer connecting with a tree in Singapore Botanic Garden (Bian Tan)

These experiences demonstrate that the connection formed isn't only external—as Dr. Elouard puts it, "The exploration of our relationship with nature leads us to the discovery of our inner landscape." She adds, "Trees allow us to be truly ourselves; they accept us as we are, without having to guard ourselves, as often happens when we are with people. This acceptance leads to an opening of our heart. I have witnessed this many times, where participants find themselves sorting out personal issues through their interaction with their companion tree. I've seen patients with cancer re-unite with their heart and self-worth instead of being preoccupied with the sick part of their body and even smiling when connecting with their inner joy of being."

The healing power of trees is especially relevant in today's world, where anxiety, stress, and burnout are widespread. Education in botanic gardens has largely and traditionally served science and intellectual engagement. But now, institutions like KFBG are pioneering a broader vision—one that includes a deeper emotional and spiritual healing. Josephine Woo notes, "By restoring our bond with trees, we can rekindle a kinship with nature that modern life has lost." As interest and demand for mental health and well-being grows, there's a pressing need for new models of care. Nature-based practices, including tree energy work, offer a readily accessible and profound complement to conventional therapies. Trees are not just passive elements of the landscape. They are living beings that can offer us emotional grounding, spiritual insight, and personal transformation. Through conscious engagement, we can rediscover a relationship that nourishes both our inner world and helps heal the world in return. At KFBG and beyond, this evolving understanding is creating space for a more heart-centered, holistic connection to nature, and the realisation that we are part of nature. The next time you find yourself near a tree, take a moment to breathe. And listen. Let its quiet presence remind you of your own true nature. The energy is there—for all of us to rediscover.

"The key is awareness: the benefits of tree energy are enhanced when we consciously engage with it."
Dr. Claire Elouard

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Practical session at 11th ICEBG in Seoul (Bian Tan)

Authors: Andriy Prokopiv and Anthony Allison

UKRAINE'S BOTANICAL GARDENS: PLAYING A CRUCIAL ROLE IN WARTIME UKRAINE

Educational programs at Ukraine's botanical gardens, developed with international support, serve a broad range of participants, including children, families, the elderly, and military veterans. The war with Russia has brought many challenges and has also increased the importance of botanical gardens as centers of restoration, nature healing, and education.

The role of Ukraine's botanical gardens has never been more important, or more challenging, than it is today. In addition to housing critically important botanical collections and research, during the war with Russia, Ukraine's gardens have been serving as crucial centers of restoration, nature healing, and education for Ukraine's traumatized population.

The challenges in fulfilling this role include:

1. A large-scale exodus of staff members, especially at the beginning of the war. While some staff members have returned, wartime privations, lack of compensation, and physical danger have kept many away.

2. Government budgets for botanical gardens have been sharply reduced and redirected to the war effort, leading to problems compensating staff members and maintaining or improving garden infrastructure.

Above: Educational program for children in Lviv University Botanical Garden

In addition to housing critically important botanical collections and research, during the war with Russia, Ukraine's gardens have been serving as crucial centers of restoration, nature healing and education for Ukraine's traumatized population.

Left: Therapeutic Horticulture workshop in Poland

3. Ongoing Russian missile and drone attacks on Ukraine's energy systems have created problems in maintaining greenhouse collections during cold winter periods and have hindered communications and other daily activities.

4. Ongoing Russian attacks and frequent air raid alerts have been disruptive and dangerous for public programs of any kind, as well as deeply stressful to staff and visitors.

Before looking more closely at how Ukraine's botanical gardens have met these wartime challenges, this article will briefly examine the bigger picture of developing innovative education programs, and the role of international collaboration using Lviv University Botanical Garden as the main example.

Ukraine's botanical gardens have a long and rich history, with several tracing their origins back to the nineteenth century. Most of the larger gardens are associated with universities. For most of their history, the main roles of the gardens were to create and manage diverse floral collections, and to conduct botanical research. In recent decades, they began to open up to the public. In the immediate pre-war period, the National Academy of Sciences gardens were generally open to the public, while the floral collections of the university-based gardens were used mainly by students for their coursework, by schools for educational field trips, and by scientists for scholarly research.

Beginning in 2005, Lviv University Botanical Garden conducted "Open Door" days, which often featured blooming plants such as magnolias, rhododendrons, and dahlias. Visitors participated in educational games and masterclasses and enjoyed musical concerts and presentations on scientific topics. Each year, up to 15 such "Open Door" days were held, with the main goal being to increase the garden's prominence not only as a center of plant diversity but as a place where the general public can learn about and enjoy nature. On "Open Door" days, up to 10,000 people visited the garden. "Open Door" days were halted by the Covid-19 pandemic.

During the pandemic the garden significantly increased its presence on the internet and in social media, with informational posts about plants and their essential roles in ecosystems and human life. The garden also began offering online "Video Strolls," which now have approximately 25,000 subscribers; individual videos have attracted over 145,000 views. Since 2023, Lviv University Botanical Garden has been open to visitors on a daily basis except during the winter months. Garden staff focus on interactive techniques to engage audiences. These include outdoor fairs with nature painting exhibits and instruction, gardening exercises, nature-based games, and other hands-on activities. An annual event, "Scarecrow in the Garden," is popular among schoolchildren: they use their creativity to make scarecrows while learning about ecological methods of protecting plants. Programs for schoolchildren and preschoolers now include theme-based lessons such as "Methods of Fruit and Seed Dispersion in Nature," "Patriarch Trees," and "How We Can Assist Pollinator Insects." Signage with QR codes has been installed in the collection of "Useful Plants" (a project partially funded by BGCI), and a tactile sensory circle invites visitors to walk barefoot over different natural surfaces. Such innovations and greater public access have led to a large increase in the garden's visitors in recent years.

Therapeutic Horticulture session at Odesa University Botanical Garden

Signage with QR codes has been installed in the collection of "Useful Plants" (a project partially funded by BGCI), and a tactile sensory circle invites visitors to walk barefoot over different natural surfaces.

The role of Ukraine's botanical gardens has never been more important, or more challenging, than it is today.

Tactile sensory circle in action

At the beginning of the full-scale Russian invasion in early 2022, BGCI, passed on financial assistance to Kharkiv Botanical Garden from the Minnesota Landscape Arboretum (USA). Shortly thereafter, Partnerships for Nature (PN), a US nonprofit that had been collaborating with Ukrainian botanical gardens on education projects for several years, provided financial support to four leading gardens, including Lviv University Botanical Garden. This initial funding was used primarily to retain garden staff, the most pressing need at the time.

PN's initiative was then joined by BGCI in a larger fundraising campaign that elicited a generous response from BGCI members, especially US botanical gardens. By the end of 2022 over $100,000 had been raised, which was distributed to 10 leading Ukrainian botanical gardens to support their staffs, install equipment to ensure heating of greenhouses, and other critical needs.

At the beginning of 2024, PN began introducing Therapeutic Horticulture (TH) to Ukraine's botanical gardens at their request. A series of online seminars was led by Emilee Weaver, manager of TH programs at North Carolina Botanical Garden. In the summer of 2024 five Ukraine botanical gardens began introducing pilot therapeutical horticulture programs to aid displaced families, veterans, and others experiencing loss and stress from the war. In June 2025, 10 Ukrainian garden leaders received TH certificates of competency. They will in turn train additional Ukrainian garden staff in TH, expanding programs to broader sectors of Ukraine's population. Weaver, now with Root In Nature, a Canadian organization devoted to TH, continues to work closely with PN and its Ukrainian partners.

Thanks to donor and grant support, PN was able to lead workshops on interpretative techniques and TH for Ukraine's botanical garden staff in Poland, at Bolestrazyce Arboretum, in 2023 and 2024, and to bring Ukrainian garden leaders to London in 2024 for training in new methods of education and public outreach. These in-person trainings have been accompanied by ongoing webinars featuring presentations by international specialists on education-related topics, and by Ukrainian garden leaders showcasing their own projects. In 2025, PN provided "mini-grants" for development of new education and TH programs in seven Ukrainian gardens. These programs will be further developed in 2026, subject to funding.

In June 2025, the authors were fortunate to participate in the 11th International Congress on Education in Botanic Gardens in Seoul, Korea, where we presented much of the material in this article. The Congress provided a unique opportunity to share our work with a diverse international audience, and to learn about the innovative education programs of others around the world. Participation also led to new relationships that will be of great help as Ukraine's gardens continue their challenging work. Warm thanks to the Korean Congress hosts for providing funding support for Andriy's travel and participation.

The immensely destructive, tragic war with Russia goes on, at great cost to human life and well-being. The challenges faced by Ukraine's botanical garden have not lessened as they seek to fulfil their crucial role as centers of restoration, nature healing, and education. To do this, they will need to maintain and augment their staff, care for their floral collections and infrastructure, and continue to offer accessible and effective programs to the traumatized Ukrainian population. The support of the international community will remain essential.

If you would like to support this work, please see the donation information on the website of Partnerships for Nature https://www.partnerships-for-nature.org/, or contact its Board President, Anthony Allison, at anthonypallison@gmail.com

Gardening with children at Kharkiv University Botanic Garden

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EAST ASIA IN ONE VOICE: UNESCO–KOREA NATIONAL ARBORETUM JOINT SESSION AT 11TH ICEBG

At the 11th ICEBG, the Korea National Arboretum (KNA)-UNESCO joint session united arboreta and botanic gardens from China, Mongolia, Korea, and Japan to explore their role in advancing Education for Sustainable Development (ESD). While challenges were noted, KNA and UNESCO signed an MoU to strengthen East Asian cooperation and establish a global model for botanic garden education.

Climate change and biodiversity loss are challenges far too great to solve with science and technology alone. Real solutions emerge when people learn to live in harmony with nature—and put that knowledge into practice. That is why botanic gardens and arboreta are gaining such attention today. They are not only centres for plant research and conservation but also living classrooms where people can experience what it truly means to coexist with the natural world.

Korea National Arboretum, together with UNESCO, hosted a special session with national botanic gardens and arboreta from Korea, Japan, Mongolia, and China. In this session, each country shared examples of education programmes focused on Education for Sustainable Development (ESD) and discussed new ways to work together.

UNESCO: Science is for all

Dr. Ai Sugiura, Head of Science, UNESCO East Asia, opened the session by emphasizing that botanic gardens must become vital spaces for putting the spirit of "science for all" into practice. She stressed that botanic gardens and arboreta should create opportunities for everyone to engage in science through citizen science programmes, while also respecting local and indigenous knowledge. At the same time, they should actively embrace digital technologies and open science as powerful tools for education and public engagement.

Above: KNA-UNESCO Session at 11th ICEBG (Korea National Arboretum)

Tomohisa Yukawa, Director of Tsukuba Botanical Garden (Japan), shared ESD cases from Japan (Korea National Arboretum)

To advance this vision, UNESCO outlined ten key roles for botanic gardens and arboreta: (1) Monitor biodiversity, (2) Educate across generations, (3) Empower youth, (4) Promote inclusivity, (5) Share data openly, (6) Protect indigenous knowledge, (7) Engage cities, (8) Partner widely, (9) Use new tech, (10) Inspire actions.

Japan: Connecting botanic garden education with the SDGs

Many of Japan's botanic gardens were originally established under the Ministry of Agriculture or the Ministry of Construction, and for decades their educational role was limited. More recently, however, they have shifted focus toward developing programmes aligned with the UN Sustainable Development Goals (SDGs). The Japanese Association of Botanic Gardens has taken the lead by strengthening staff training, producing educational resources, and promoting SDG practices through annual workshops.

A review of programmes from 23 gardens across Japan found links to all 17 SDGs, one notable example is the Cacao Project. Using cacao trees (*Theobroma cacao*) grown in a garden, children learn how chocolate is made while exploring broader themes such as biology, fair trade, and labour practices. With each stage tied to multiple SDGs, the programme has been well received, showing how botanic garden education can link everyday experiences to global challenges.

Mongolia: National campaign to plant one billion trees

Since 2021, Mongolia has been leading a nationwide campaign to plant one billion trees by 2030 in response to the pressing challenges of climate change, desertification, and yellow dust storms. At the heart of this initiative, the Botanic Garden of the Mongolian Academy of Sciences plays a central role—recommending suitable tree species, establishing a seed bank, distributing seedlings, providing public education, and coordinating large-scale planting events. The campaign goes far beyond reforestation, serving as a broad educational programme that actively involves citizens and youth.

Mongolia's progress against its tree planting targets has been slower than expected, and funding challenges remain, but collaboration and knowledge-sharing with neighboring East Asian countries could help transform the initiative into a more sustainable and scalable educational model.

China: Connecting botanic gardens, schools, and communities

China has built an educational model linking botanic gardens with schools and communities. 83 major gardens engage more than 12 million students each year, serving as hubs for Education for Sustainable Development (ESD).

Several programmes illustrate this approach. Shanghai Chenshan Botanical Garden runs a Carbon Neutrality Experience Centre to teach ecological balance. Chengdu Botanical Garden operates a Community Plant Clinic that trains residents as "plant doctors." Hangzhou Botanical Garden developed the Silver Nature Guide programme, training retired teachers as garden interpreters. Meanwhile, South China Botanical Garden partnered with the city of Guangzhou on "From a Botanic Garden in the City to a City in Nature," Representing China, Ren Hai, Director of the South China Botanic Garden, outlined three priorities for the future: 1) mutual recognition between school curricula and academic credits, 2) standardization of community service programmes, and 3) creation of a digital platform for sharing plant resources and knowledge.

Ren Hai, Director of South China Botanical Garden, presented ESD cases from China (Korea National Arboretum)

In China 83 major gardens engage more than 12 million students each year, serving as hubs for Education for Sustainable Development.

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Korea: Nurturing future talent through a youth internship programme

Korea is the first country in East Asia where a national institution places young professionals directly into private arboreta and botanic gardens through a dedicated youth internship programme. Established in 2024 by the Korea National Arboretum, the programme gives people aged 19 to 34 the chance to gain practical experience in biodiversity conservation, environmental education, and plant research at sites across the country for three to six months.

Many interns are placed in private arboreta, allowing them to meet the founders who created these gardens and to learn firsthand about the philosophies and values that guided their establishment—an experience that goes far beyond routine training.

Surveys recorded high satisfaction scores and some participants have secured full-time jobs or entered public service in related fields, underscoring its career-building impact. Looking forward, the programme has the potential to evolve into a global model for ESD, with plans to expand through job rotation, mentoring, regional youth networks, and international partnerships.

Groundwork for long-term cooperation in East Asia

The UNESCO–Korea National Arboretum Special Session reaffirmed the vital role of botanic gardens as hubs for ESD in East Asia. Case studies showed how they provide opportunities for citizens and students to learn about climate action and biodiversity while fostering community-based education models.

The session also highlighted key challenges: staffing and funding shortages in Japan, slow implementation and limited resources in Mongolia, curriculum integration and service standards in China, and sustainability issues in Korea's internship programme. To address these, Korea National Arboretum and UNESCO signed an MOU, launching joint projects that lay the groundwork for long-term regional cooperation in East Asia.

KNA-UNESCO MoU Signing Ceremony (Korea National Arboretum)

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Jun Gyu Bae, Director of Garden & Education at KNA, introduced Korea's youth internship programme (Korea National Arboretum)

PERSONAL EXPERIENCES AT THE 11TH INTERNATIONAL CONGRESS ON EDUCATION IN BOTANICAL GARDENS

Harriet Kokugonza, Tooro Botanical Gardens, Fort Portal, Uganda

Attending the 11th ICEBG was a truly inspiring experience, both professionally and personally. Coming from Uganda and representing Africa, I felt honoured to join a diverse community who are passionate about conservation and botanic garden development. What I enjoyed most was the opportunity to share knowledge across continents, to listen, learn, and exchange experiences with colleagues working in very different ecological and cultural contexts, yet facing similar challenges. The keynote speeches gave me valuable insights on approaches for engaging children and youth led climate action and biodiversity conservation. The field visits and interactive sessions offered practical insights into innovative approaches that can be adapted to my own context.

My key take-away from the congress is the importance of collaboration and inclusivity in conservation. The congress emphasized that the future of biodiversity protection lies in building strong partnerships, engaging communities, and linking global conservation goals with local realities. I returned home encouraged to strengthen Tooro Botanical Gardens regional networks, apply new ideas within our programmes, improve children's participation in nature conservation, and contribute more actively to global biodiversity initiatives.

Harriet Kokugonza at ICEBG (KNA)

Adriana Burgos, Carlos Thays Botanical Garden, Buenos Aires, Argentina

Attending the 11th ICEBG was an inspiring and energizing experience. What I enjoyed most was the opportunity to connect with colleagues from around the world and to learn from the diversity of programmes and approaches being implemented. These exchanges not only broadened my perspective but also gave me concrete ideas to bring back home.

I especially appreciated the presentations "What Tastes Like Home" (United States Botanic Garden) and the "Biodiversity Day" initiative (UBC Botanical Garden), which I would love to adapt in my own botanic garden. I also valued the sessions on climate anxiety, and inspiring talks on fostering both rational and emotional engagement in young people, delivered by speakers from Kew Gardens, Naples Botanical Garden, Farmer Tantoh, and others. Building capacity in youth is a subject I am deeply interested in, and these examples provided valuable insights and motivation. The Congress also offered an opportunity to update my knowledge of new global frameworks, such as the Global Strategy for Plant Conservation, which will be useful for educational planning in the years ahead. My key take-away is that botanical gardens worldwide are more relevant than ever, serving as powerful platforms for education, dialogue, and hope.

Adriana Burgos at ICEBG

Qing Wang, Shan Li, Weizhe Zhang, Fairy Lake Botanical Garden, Shenzhen, China

The 11th ICEBG was more than a Congress; it was a powerful reminder of why we do this work. We explored how botanic gardens around the world are becoming beacons of hope, quietly shaping a more sustainable and compassionate future.

We witnessed four profound shifts:

1) the power of theory-based learning helped to root knowledge not just in the mind, but in the heart;
2) how digital tools like VR were breaking down barriers, making complex topics like climate change easier to understand—and let botanic garden educators create more freely;
3) the magical fusion of art and science, where a single painting or a native flower could awaken a deeper ecological consciousness and engagement;
4) and the courageous push for inclusive co-creation, ensuring that everyone—especially the most vulnerable—has a place in this conversation.

Seeing educators from Uganda persevere with limitless passion, despite having almost no resources, was deeply humbling. We Chinese botanical garden educators were privileged to share stories from China about cross-border partnerships and educational innovation and to learn from so many others. This Congress wasn't just about trends—it was a soulful journey that reaffirmed a simple truth: at the intersection of technology, education, and unwavering human care, we will find the path forward.

Colleagues from Fairy Lake Botanic Garden (KNA)

Maxime Boersma, Thal Jonas & Nuala Teerink, Hortus Botanicus Leiden, Netherlands

At the 11th ICEBG we were truly touched by the dedication of so many participants from different gardens and arboreta. Everyone contributed their perspectives and educational expertise on the topic of climate change and biodiversity loss, engaging audiences both young and old.

With great gratitude to our host KNA we enjoyed the astonishing Congress setting and exciting tours. We were amazed by the level of attention to delegates by all involved in the organization. South Korea showed us its diverse scenery of landscapes, warm hearted people, lively cities, unique culture as well as its fine cuisine.

BGCI gathered a wonderful diverse group of inspiring people from across the globe to share their thoughts and goals on education in botanical gardens. Overall, we are impressed by the shared optimism that we can make a significant contribution to a better world through our combined efforts. We are truly honored to host the 12th ICEBG in our hometown Leiden in 2028, and hope that we in the meantime continue on this fine path.

Team Leiden with their Biomimicry poster

A CELEBRATION OF PLANTS: REVIEW OF *THE STUFF THAT STUFF IS MADE OF* BY JONATHAN DRORI

In this issue our resources section highlights a new book by Jonathan Drori – The Stuff That Stuff Is Made Of. BGCI's Education and Training Manager Ane Zabaleta reviews it.

The Stuff That Stuff Is Made Of: Things We Make with Plants (published by Magic Cat in September 2025), is a book for anyone who delights in discovering the extraordinary stories hidden in the everyday.

Jonathan Drori takes thirty plant species and explores how they grow, why they matter, and the surprising, and sometimes mysterious ways humans have used them across history and cultures. He reveals how dandelion rubber ends up in truck tyres, baobab bark can be used to create hats and bamboo to create instruments, and how cork is used in spacecrafts! Each plant is introduced not only as a raw material but as a character with a story: rich in folklore, science, engineering, and environmental significance. The book moves from the past to the present, from ancient traditions to modern innovation.

One of the most striking aspects of the book is its design. The illustrations are beautiful, full colour artworks that complement the text and bring the plants to life on the page.

For me, the great pleasure of this book was discovering stories that feel at once familiar and surprising. It made me look at ordinary things like paper, chocolate, clothing, even tyres, in a completely new light. I found myself sharing "did you know?" moments with friends, a sure sign of how engaging the stories are.

The Stuff That Stuff Is Made Of is one of those rare books that can sit proudly on a child's bedside table, in a school library, or on the shelf of an adult reader. It is a family book in the best sense: one that can be shared, discussed, and enjoyed across generations. For anyone who has ever marvelled at the natural world, or for anyone who needs reminding of just how important plants are, this book is a treasure.

The Stuff That Stuff Is Made of is out now:
https://www.magiccatpublishing.co.uk/products/the-stuff-that-stuff-is-made-of

JONATHAN DRORI CBE is a Trustee of The Eden Project and Cambridge Science Centre, an Ambassador for the WWF and used to be a Trustee of the Royal Botanic Gardens, Kew, and The Woodland Trust. He is on the board of BGCI and Cambridge University Botanic Garden, and is a Fellow of the Linnean Society, the Zoological Society of London and the Royal Geographical Society. He continues to take a keen interest in plants; especially economic botany, ethnopharmacology and plant genetic resources, and has accompanied several Kew botanical expeditions, making short films about their discoveries.

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CONTRIBUTE TO THE NEXT ISSUE OF ROOTS

The next issue of Roots will focus on Cultural heritage in botanic gardens. Cultural heritage in a botanic education context is about understanding identity and belonging, using cultural diversity to shape our storytelling, and encouraging intercultural dialogue to foster mutual respect and empower new voices. Have you been embedding cultural heritage in your programming? Do you have a project that has been working with local communities, or championing indigenous voices? What does cultural heritage mean to your work?

We are currently looking for a variety of articles on this important topic.

To contribute, please send a 100 word abstract to **annelies.andringa-davis@bgci.org** before January 15 2026.

HELP SHAPE THE FUTURE OF BOTANIC GARDEN EDUCATION

Botanic gardens have long served as vibrant, living museums of plant life—places where science, conservation, and education meet. As dynamic venues for public education, they play a vital role in fostering environmental awareness and biodiversity literacy. Despite this, the ways in which botanic gardens design and implement educational programmes remain insufficiently documented on a global scale. How are gardens engaging today's visitors? What challenges do they face, and what innovative practices are emerging across the globe?

To answer these questions, we warmly invite directors and education professionals from botanic gardens worldwide to participate in the Botanic Garden Education (BGE 2025) survey—a new international study designed to provide a comprehensive overview of current practices, priorities, and challenges in botanic garden education.

The BGE 2025 Survey is open now! **https://sunet.artologik.net/gu/survey/36911**
Contact: Harald Raaijmakers – **harald.raaijmakers@gu.se**