



BioBeo Final Report

Innovative education for the bioeconomy



BioBeo is a Horizon Europe (2022-2025) project with 15 partners in 10 European countries with the aim to develop and deploy an education programme to enhance engagement across society regarding lifestyle, circularity and bioeconomy, using 5 bioeconomy themes: Interconnectedness, Outdoor Learning, Forestry, Life Below Water, and the Food Loop.

This report highlights the innovative educational resources developed in the project and are free to download from the website: www.biobeo.eu.



Co-funded by
the European Union



Education Programme

Curriculum Change

Further Resources

Achievements

Preschool and Primary School Materials



An **English and Irish Language Education Programme** for Primary Schools will feature five outdoor learning sessions, where children and teachers will explore local bioeconomy themes and engage with their environment under the guidance of Múinteoir BioBeo.

Bees are essential workers in nature, with beekeeping playing a vital role in the bioeconomy through sustainable honeybee management for pollination and production of honey and bee products.

Secondary School Materials



The **Teacher's manual** includes six lesson plans, each with a PowerPoint presentation, and worksheets on five bio-economy themes that can be taught in any sequence or as stand alone.

It aims to develop key competencies in sustainable development, aligning with several SDGs (2, 3, 12, 13, 14, 15).

It also includes an excursion to **BlueCity** in Rotterdam to engage students with real-world bioeconomy applications and sustainability through start-ups.

How to: Bioeconomy Education



The **Train-the-Trainer Manual** provides a training program for involving stakeholders in governance and implementation, focusing on community, parental, and child participation. It includes self-directed learning, training activities, and peer-training materials.

The **Missing Link guide** bridges bioeconomy education theory with practical lesson plans, offering strategies for engaging school stakeholders. It provides practical advice, self-reflection tools, and supports sustainable teaching practices.

Idea gathering and youth engagement resources



Youth Policy Engagement - Turn Ideas into Action!

Writing a clear, compelling policy memo is a powerful way to communicate your innovative ideas to decision makers. Use your creativity to craft well-researched, actionable recommendations that can drive positive change in the world.

Your voice matters—make it heard and inspire the policies of tomorrow!

Further Materials



Teachers' Manual - How To Grow Mushrooms: Incorporating mushroom cultivation in classrooms creates an engaging learning experience, teaching students about the bioeconomy, eco-friendly practices, culinary uses, reduced carbon footprints, circular concepts, nutritional value, and health benefits.



Curious about what a career in the bioeconomy could look like? [Bioeconomy Career Profiles](#)

This is a great resource for educators and students to explore inspiring career pathways through exclusive interviews: meet a Conservation Ranger with the National Parks and Wildlife Service, an Education Coordinator, and a PhD student researching innovative bio-based materials!



Buzz Words

"BioBeo embedded inclusive, multilingual learning using **Universal Design for Learning** principles. Youth participation was central: young people co-created content, represented their views on bioeconomy education, and shared their creative responses at the **BioBeo Festival in March 2024 and with EU policy makers**"
- Associate Professor Máire Nic an Bhaird of Maynooth University.



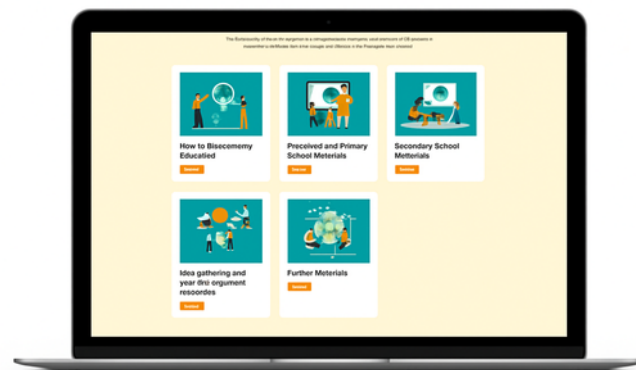
"I think it is a great honour and a great success for **BioBeo** that we are seen as an essential partner for new schools and a guarantor of quality in curriculum development with regard to the bioeconomy and circular economy."

- Dr Evelyn Reinmuth, Head of University of Hohenheim's Bioeconomy Office

Digital Handbook

Guide for Introducing New Content to Schools" assists in integrating fresh topics like bioeconomy into classrooms. Developed under the BioBee project, it helps understand the institutional landscape and provides practical tips and materials. Readers will navigate challenges and meet key players in the process. Ready to explore? Dive in!

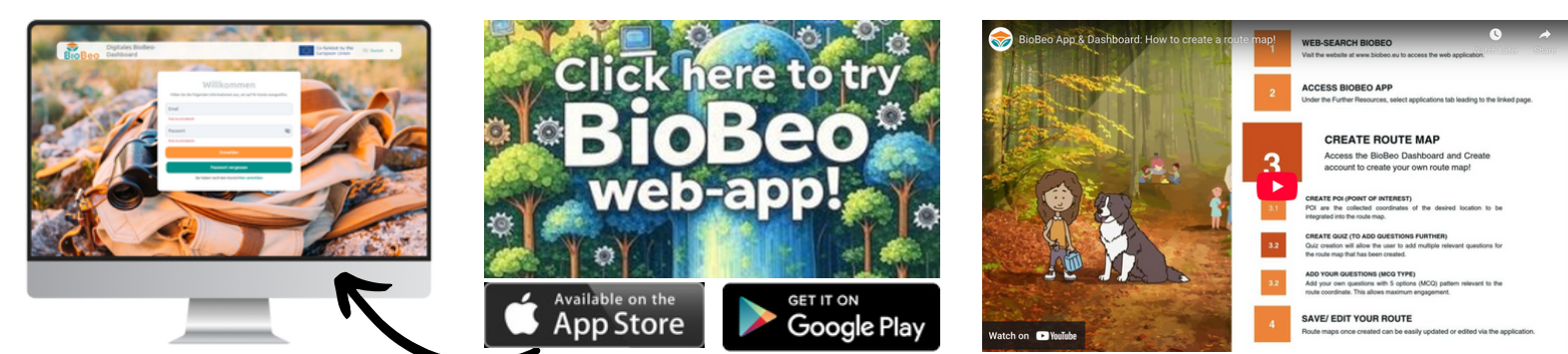
So, grab your explorer's hat, and let's dive in!



Blueprint and Methodology for Innovative Governance

This report examines the institutional and social environments for introducing bioeconomy content in schools across various countries, identifying favorable models and conditions. The preparation involved a template for project partners to gather necessary information, including expert knowledge, statistics, literature reviews, legal analysis, and curriculum evaluations. Data collection was enhanced by semi-structured interviews with educators and authorities. The CASE team analyzed the data using thematic analysis to identify and present recurring patterns.

Applications



Meet the BioBee App, where nature lovers become eco-adventurers in a lively location-based game! Choose your age-tailored trail and embark on a biodiversity quest, answering quirky quizzes to earn points. With child-friendly paths, the app offers 28 routes, 147 fascinating spots, and 418 brain-teasing questions, plus you can create new trails! Available on the web, Android, and iPhone, it's sweeping across Europe. No worries about privacy—no personal info collected! [Download here](#) a guide for teachers, educators, and school staff or watch the video.

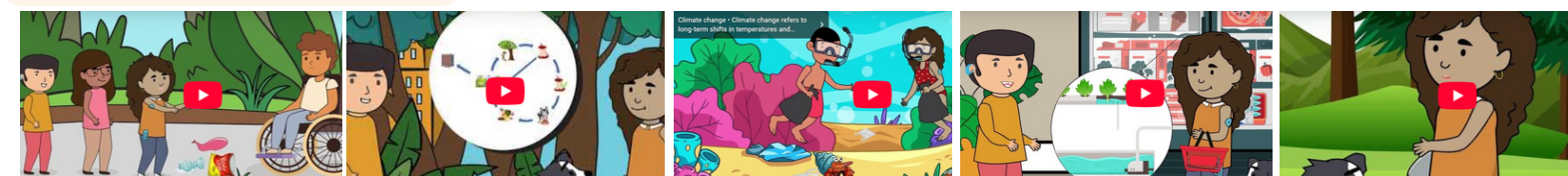
BioBee Dashboard is a tool for educators to create routes and assign quizzes to the point of interests. These routes and quizzes will be available on the BioBee App for the students to go around their area and learn about bioeconomy. The [dashboard](#) can be accessed here!

Videos



[Watch here](#) or [visit the BioBee YouTube](#) Channel for our BioBee song, music, animations and more videos! **Animated Storytelling Video Series.** The animated storytelling videos aim to introduce the concept of the bio-economy through fun & engaging animations illustrating how we can all participate in creating a sustainable world!

Beo's Bioeconomy Sing-Along



"BioBee Comic: Answering the Curlew's Call" examines the links between language, heritage, culture, and the bioeconomy, stressing the curlew's significance for conservation and sustainable living featuring Douglas Hyde and David Gray, emphasizing cultural preservation and ecological awareness.

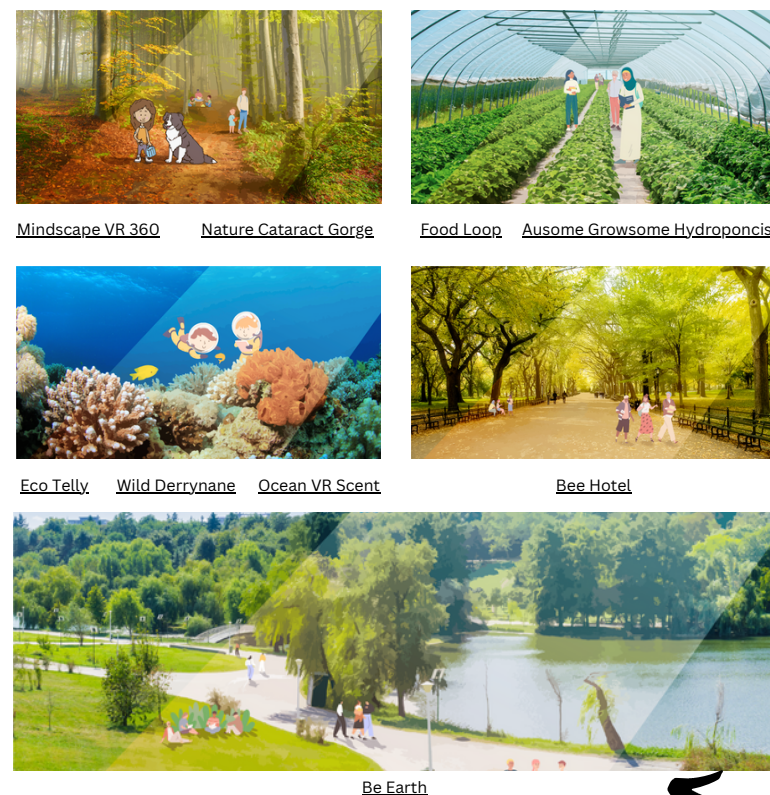
The [world's first circular bio-economy puppet show](#), using biobased materials. The show raises awareness about biodiversity, particularly the endangered curlew bird, while promoting the Irish language and sustainability. Teacher guidance notes facilitate global classroom replication, highlighting the blend of environmental awareness & cultural preservation.

BioBee Interactive XR Tools

Be Earth for the Bioeconomy!



The BioBee XR Toolkit (VR/AR) is here! Developed by UCD's SMARTlab, these innovative and accessible tools immerse learners of all ages in the circular bioeconomy's five core themes. Key resources include the Be Earth VR Climate Action simulation and the Bee Hotel XR Experience. Accessibility is prioritized: Be Earth VR was re-coded for use on the untethered Quest Headset or for simple 360vr viewing on standard computers or mobile phones, supporting participation even in low tech environments.



The toolkit is designed to inspire solutions, increase personal responsibility, and deepen understanding of complex topics.

Ready to explore these resources designed to shape a sustainable future Visit www.biobee.eu/xr-tools/ today!



Comics



Finding Beo, introduces to the concept of bio-economy and emphasizes the connection between all the themes.



Back to the Future with Beo and Raja, gives us a glimpse into the early bio-economy. This adventure set in UCD Centre for experimental archaeology allows us to venture into the past.

Answering Curlew's Call, highlights the connection between language, culture, land, and the bioeconomy, drawing inspiration from Douglas Hyde's vision. It illustrates how these elements have historically influenced societal change, from the quest for independence to addressing climate change.

Find an animated video version and a puppet show based on this comic in our video section!

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Games



The board game [Resource Don't Go!](#) was created by international students during a summer school focused on bioeconomy. It offers playful insights into sustainable and circular bioeconomy challenges and is suitable for schools and universities. Learners can create and present their own playing cards, making it adaptable for various bioeconomy-related courses.

Podcasts



Delve into groundbreaking bioeconomic insights and revelations with podcast host Hailey Ciantar and podcast editor and producer Rita Escórcio. Through a series of interviews, you will learn about bioeconomy's presence in various sectors. **Bioeconomy Matters!** [Click Here to listen to the podcasts!](#)



On March 15, the **BioBeo bioeconomy festival** was held at Odisee University in Brussels, aiming to connect bioeconomy with education, supported by the European Commission. As part of the EU Bioeconomy Changemakers Festival, it featured workshops, lectures, live music, comedy, and art installations.

Secondary school students learned about growing mushrooms on coffee grounds and explored forest beauty through art. European Commission officials attended, highlighting the festival's role in promoting sustainable initiatives among youth. **Klees Komp showcased his book "The Rainmaker"**, highlighting that everyone can make an impact, regardless of age or size. He emphasized collective action to combat climate change.



Education Programme

Curriculum Change

Further Resources

Achievements



The [BEST network](#), an extension of the BioBeo project, is a community of bioeconomy and sustainability educators, launched in March 2025 via the 'BioBuzz' newsletter. It will host an annual meeting for sharing best practices in bioeconomy education. Educators from the BioBeo Blended Intensive Programme will lead the network and recruit new members, ensuring long-term collaboration and ongoing dissemination of bioeconomy and sustainability content in education.



The BioBeo Horizon Europe Project and BiOrbic hosted a [Ceardlann Oideachais: BioBeo and BiOrbic Bioeconomy Education Workshop](#) at UCD Global Lounge on February 20th, addressing biodiversity loss and innovative research communication. Participants included researchers, educators, journalists, and policymakers. The event showcased a comic about the Curlew's decline, a board game on chocolate life cycle assessment, and VR/AR experiences of the Amazon rainforest, led by Prof. Lizbeth Goodman. John Bell from the European Commission emphasized the significance of education for future generations. Mary Colwell, founder of Curlew Action, inspired attendees with her message on protecting the Curlew.

Find out more of our achievements!!



[Click Here](#)



Neue Privatschule startet

Bildung Nach langer Vorbereitungszeit geht die frisch gegründete Naturschule in Göppingen an den Start. Auf der Zielgeraden mussten die Initiatoren zittern. Von Susann Schönfelder

BioBeo has helped establish LENA, a primary school focused on bioeconomy education. It helped establish LENA, a primary school focused on bioeconomy education. LENA, "Lebendige Naturschule," encourages children to explore their curiosity in both indoor classrooms and outdoor environments. The school emphasizes community involvement and outdoor learning for optimal development, with parental engagement being a key component, supported by partners from "Parents International."

Buzz Words



"Bioeconomy will now be a topic in a new subject 'Climate Action and Sustainable Development' for secondary school students in Ireland. We were delighted to contribute to this development."

- Associate Professor Tom Curran, BioBeo Coordinator, University College Dublin.



"In the 2024 Global Action Days, participants were invited to find, photograph and share examples of day-to-day items produced through bioeconomy. Over 70 500 participants from more than 500 settings across 60 countries took on this BioBeo activity."

- Reeza Hanselmann, FEE International Coordinator of Education



In the heart of Rotterdam, an extraordinary collaboration emerged, spearheaded by Rotterdam University of Applied Sciences (RUAS) in partnership with Maynooth University (Ireland) and OUAS (Belgium), as part of the [Bioeconomy and Sustainability Education \(BIP\) initiative](#). The mission was to cultivate cross-border partnerships centred on education and sustainable solutions. With vital support from ERASMUS, BioBeo, and BiOrbic, this international programme strengthen the collaboration in the fields of bioeconomy and sustainability education. This initiative aims to improve educational practices and to inspire them to adopt the sustainable innovations.



The Netherlands held the [Week of Economics Education](#) to promote future-proof economics education, involving BioBeo members and 14 Dutch universities of applied sciences. The program aimed to inspire diverse economic thinking and address how to prepare students for increasingly pressing global questions.

DELIVERABLES

D1.1 Gender Action Plan GAP

D1.2 Data Management Plan

D1.3 Advisory Board

D1.4 Final Public Summary Report

D2.1 Train the trainer manual

D2.2 Blueprint and Methodology for Innovative Governance

D2.3 Report on engagement

D2.4 Digital Handbook

D3.1 Developed BioBeo Education Programme

D3.2 BioBeo VR AR tool

D3.3 Interconnectedness

D3.4 BioBeo Festival and Ambassador Programme

D3.5 Apps and Animated videos

D3.6 Evaluation report

D3.7 Inaugural Meeting of the BioBeo Educators' Network for the Future

D3.8 Teacher Education

D3.9 Career Development

D4.1 Dissemination and Communication Plan

D4.3 Initial Exploitation Plan

D4.4 Final report on Dissemination and Communication

D4.5 Final Exploitation Plan

Long-Term Impacts of BioBeo

BioBeo’s influence stretches well beyond its original 30-month horizon. Its key outputs — from toolkits to teaching frameworks — are already embedded in schools, policies, and training curricula across Europe, with the potential to grow globally.

Policy Shaping Across Europe

Ireland: BioBeo informed the Irish Government’s Bioeconomy Action Plan (2023–2025), setting the tone for education-led sustainability.

The Netherlands: BioBeo contributed to curriculum reform, integrating sustainability and circular economy principles.

European Commission: BioBeo featured prominently in policy workshops with EC DG RTD, influencing future EU bioeconomy education strategies.

Embedded in Education Systems

Integrated in schools across Ireland, Germany, the Netherlands, Greece, Romania, and Spain.

BioBeo Education Programme adopted by teacher education modules, Gaelscoileanna, and inclusive classrooms.

Tools like the BioBeo App, Dashboard, and XR experiences continue to be used and developed for future learners.

Ongoing Dissemination & Networks

The BEST (Bioeconomy Education and Sustainability Teachers) Network continues BioBeo’s outreach.

BioBeo Buzz newsletter and Bioeconomy Matters podcast are sustained by biOrbic.

Resources are accessible at: www.biobeo.eu

Global Reach and Community Impact

BioBeo’s Global Action Day campaigns reached:
450,000 participants (2024)
670,000 participants (2025)
Engaged diverse groups: migrants, special education needs, and remote communities, supporting SDG 4: Quality Education for All.

Research and Knowledge Contribution

At least 5 academic publications (2025–2026) secured.
Contributions include frameworks for eco-feminist pedagogy, Froebelian outdoor learning, and bioeconomy curriculum design.
Public deliverables archived via the [CORDIS Results Page](#)

Recommendations for the Future

Strengthening the Bioeconomy Education Ecosystem

To amplify the momentum of BioBeo, the following stakeholder-specific recommendations are proposed, built from our collective work across 15 partners and thousands of learners.

For Educational Stakeholders

- Embed circular bioeconomy themes into national curriculum frameworks.
- Prioritise inclusive and multilingual materials, such as BioBeo’s dual-language Irish-English toolkit.
- Support STEAM-based, project-oriented education for real-world impact.
- Invest in teacher capacity-building through professional development using BioBeo’s “Train the Trainer” and “Missing Link” guides.

For Teachers & Educators

- Explore the BioBeo Education Programme and Dashboard for hands-on classroom use.
- Use outdoor learning, games, comics, and storytelling to boost curiosity and confidence in sustainability topics.
- Promote student-led activities, including youth idea competitions and local Bioeconomy Days.
- Leverage BioBeo’s XR, video, and app tools to make learning immersive and fun.

 **Explore teaching resources at:** www.biobeo.eu

For Policy Makers

- Foster flexible curriculum integration pathways led by teachers, schools, and local authorities.
- Use insights from the D2.2 Blueprint for Innovative Governance to design policies that include youth and families.
- Provide multi-stakeholder funding mechanisms to support long-term programmes, networks, and open resources.
- Embed citizen science and youth dialogue into governance processes.

A Shared Call to Action

BioBeo has laid the foundation — With continued support, the next generation can grow up bioeconomy-literate, sustainability-minded, and ready to shape a greener future.