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NetworkNature
Policy Brief

Integrating Nature-based Solutions in Education: Unlocking the Potential of Transformative Learning for Sustainability



in collaboration with
**NBS
EduWORLD**



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Why this policy brief? Why now?

Finding solutions for mitigating and adapting to the adverse impacts of climate change and biodiversity loss needs all hands on deck. Nature-based solutions (see info box on page no. 5) have emerged as a promising approach to address a range of environmental as well as societal challenges through the protection, restoration and sustainable management of ecosystems. However, for mainstreaming nature-based solutions (NBS), educating the young minds of today is essential. To be able to do this, policy instruments for fostering NBS education need to be highlighted, strengthened, and modified where necessary. This would allow and encourage the formal but also non-formal sectors of education to take up the task of imparting NBS Education within and outside schools and education institutions.

This policy brief provides a timely and brief overview of the current policy incentives for NBS and sustainability education in Europe, identifies key barriers and opportunities in supporting education systems in taking up NBS education and offers key recommendations for policy makers, educators, and other stakeholders. This can support them in critically examining and promoting the integration of NBS in the education sector to achieve a paradigm shift.

What does it cover?

The policy brief will primarily examine the role of formal education in fostering knowledge and awareness of nature-based solutions among young learners. Specifically, this brief will focus on the following aspects:

- An overview of relevant policies which promote nature-based solutions education
- The current state of nature-based solutions education in Europe
- Key challenges and opportunities in promoting nature-based solutions education in schools
- Strategies and best practices for incorporating nature-based solutions education in the formal curriculum
- The role of teachers, educational institutions, and policy makers in promoting nature-based solutions education in schools

This policy brief will focus solely on primary and secondary schools. Additionally, the brief zooms out to cover the broader level of education for sustainable development (ESD) in policy and practice, as much work has been undertaken in that field. However, it also highlights the nature-based solutions education niches where possible, given the novelty of NBS education and significance of mainstreaming NBS.

Moreover, it is important to state that there is little research in the field of NBS Education and not much grey literature could be found to support this policy brief underpinnings. Therefore, the basis for this brief are predominantly expert consultations and semi-structured interviews with key actors in the field of education for sustainable development (ESD) from **European Commission's Directorate General for Education, Youth, Sport and Culture (DG EAC) Spanish Ministry of Education, German Commission for UNESCO and the teacher representative of the NBS EduWORLD Teacher advisory board.**

Who should read this?

This policy brief on NBS education is intended for a wide range of stakeholders, including policy makers, educators, school administrators and leaders, environmental organizations, and other interested parties such as NBS researchers and practitioners. Policy makers at the national, regional and local level can use this brief to identify existing enabling policy instruments as well as funding programmes and make use of the recommendations to promote NBS education in schools. Educators, school leaders and administrators can use this brief to gain a better understanding of the importance of NBS education and to learn about best practices and strategies for incorporating NBS education into their curricula. Environmental organizations and NBS researchers and practitioners can use this brief to advocate for greater support and resources to mainstream NBS in schools. Ultimately, anyone interested in learning about the growing need for incorporating NBS in education sphere and the role different actors can play, is welcome to read this brief.



Enabling NBS Education: Exploring the EU policy landscape and funding options

Several European policy instruments could enable fostering nature-based solutions in the education sector. Some of the most relevant ones are listed below:

- **[A European Green Deal](#)**: The European Green Deal is a roadmap for making the European Union's economy more sustainable. It includes a range of initiatives related to climate action, biodiversity conservation, and sustainable development, which can provide a policy framework for fostering nature-based solutions education. Specifically, for NBS, **[The European Union Biodiversity Strategy for 2030](#)** is quite relevant. It sets out a range of targets and measures to be undertaken for biodiversity conservation and restoration in the EU. This strategy includes a focus on improving knowledge and awareness-raising, which can provide opportunities for promoting nature-based solutions education.
- **[Erasmus+ Programme](#)**: The Erasmus+ Programme is a European Union programme that supports education, training, youth, and sport in Europe. One of the top priorities of the Erasmus + programme is 'environment and fight against climate change'. Thus, it could also provide funding opportunities for schools and educators to develop and implement nature-based solutions education projects.
- **[EU Life Programme](#)** and **[Horizon Europe](#)**: These are the current funding programmes from the European Commission for environmental and climate action projects in the EU. These provide funding opportunities for projects related to nature-based solutions. In 2022, the project NBSEduWORLD focussing specifically on NBS Education was funded within the European framework programme Horizon Europe.

The above-mentioned policy instruments and funding programmes can be leveraged to increase the knowledge, skills and competences of youth towards nature-based solutions. However, the key strategic direction can be provided by the **[Council Recommendation on learning for the green transition and sustainable development](#)** published in 2022. The Recommendation urges Member States of the European Union (EU) to stimulate and support policies and programmes about learning for sustainability towards the green transition. Member States are also recommended to:

- 1.) Establish learning for the green transition and sustainable development as one of the priority areas in education and training policies and programmes;
- 2.) Provide learning opportunities in formal, non-formal and informal settings;
- 3.) Support and enhance teaching and learning for the green transition and sustainable development by providing infrastructure, digital tools and resources;
- 4.) Provide fact-based and accessible information on the climate, environmental and biodiversity crisis and its drivers;
- 5.) Help educators to take part in professional development programmes related to sustainability and
- 6.) actively involve students and staff, local authorities, youth organisations and the research and innovation community in learning for sustainability.

By leveraging these policy instruments, policymakers can create an enabling environment for promoting nature-based solutions education in Europe. This can help ensure that the next generation of students is equipped with the knowledge and skills needed to address environmental and societal challenges and promote sustainability over time.

The **[Global Education 2030 Agenda](#)** is another major driving force in the field of education all around the world. It draws on the SDG 4 on ensuring 'inclusive and equitable quality education and promoting lifelong learning opportunities for all'. In particular, its target 4.7 on ensuring all learners acquire knowledge and skills needed to promote sustainable development is highly relevant for identifying the entry point of NBS in education. The **[UNESCO's Berlin Declaration on Education for Sustainable Development](#)** also highlights the importance of developing and establish knowledge, skills, values and attitudes necessary for achieving sustainability. The Global Youth Biodiversity Network in its Transformative Education Policy Brief (**[GYBN 2021](#)**) also called for Post-2020 Global Biodiversity Framework to "include more concrete and ambitious language on transformative education in its targets. GYBN made an urge to create a standalone target on education to match the key role education can play in transformative change toward living in harmony with nature. Despite not having a specific target on education, the Kunming-Montreal Biodiversity Framework, explicitly mentions the role of education, capacity building and awareness raising in several targets (e.g. 16, 20, 21) to reach its goals.

NBS Education in practice: Opportunities and challenges

The current global interconnected dual crises of climate change and biodiversity loss (IPBES 2021) calls for a fundamental shift in the manner our societies and economies operate, and education can play a crucial role in achieving this transition.

The results of a global survey launched by UNESCO in 2022 indicate that about 70 Percent of the youth doubt the quality of climate change education they are taught and there is a need for high quality climate change education (UNESCO 2022).

Addressing this need is also applicable to other societal challenges as many of them are interrelated and frequently require a holistic approach. Formal education, obligatory in most countries, has the potential to reach almost every single individual. Starting early, with the young pupils and children who be the decision-makers of tomorrow, is key. Embedding sustainability, nature-based solutions, and biodiversity into teaching and learning can create the desirable impact for achieving the green transition.

The state of the art for nature-based solutions (NBS) education of youth in Europe is characterized by a growing emphasis on a whole school approach (see box) with education for sustainable development (ESD), experiential learning, schools as living labs and cross-disciplinary methods for teaching. Many schools and educational institutions are integrating sustainability topics into their curricula, and there is a trend towards hands-on activities, outdoor learning and project-based learning opportunities. Additionally, there is a growing need for youth-led initiatives in NBS education, where schools and organizations can empower pupils to take an active role in developing and imple-

menting NBS projects in their schools and communities. Moreover, the incremental development of on-line resources and tools is also an important trend in education owing to much more remote training and education as a result of the covid-19 pandemic. There is a growing number of online resources available to support NBS education, including learning scenarios, teaching guides, and interactive learning materials especially on portals such as Scientix, NBS EduWORLD and Oppla. As NBS continue to gain importance for addressing societal challenges caused by the dual crises at hand, it is likely that the field of NBS education will continue to evolve and expand in Europe.



Ulrike PISIOTIS, PhD

European Commission
Directorate-General
for Education, Youth,
Sport and Culture
Unit Schools and
Multilingualism

“Non-formal education through youth work for example or environmental organisations can contribute in great ways to the teaching and learning of NBS and biodiversity. Strengthening the links between both sides can be mutually beneficial and most important strengthen learning and teaching for sustainability in general.”





Nature-based solutions

The European Commission defines nature-based solutions as:

“Solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions.”

Nature-based solutions must therefore benefit biodiversity and support the delivery of a range of ecosystem services.

European Commission 2016, accessible [here](#).

While there has been some progress in NBS education of youth in Europe, there are still some gaps that need to be addressed:

- **Lack of teacher training:** Many teachers may not have the necessary training or knowledge to effectively incorporate NBS topics into their curricula. This can result in limited exposure to NBS education for students. Although many teachers are eager to include sustainability topics such as nature-based solutions in their teaching, they often do not feel confident yet to do so. Moreover, time is an essential factor which might hinder incorporating new ideas into already full curriculums or keep teachers from participating in training activities.
- **Limited access to outdoor learning spaces:** Outdoor learning experiences are an important component of NBS education, but not all schools and communities have easy access to outdoor learning spaces. However, this is rapidly changing as more and more schools in Europe employ NBS in their schoolyards and develop urban gardens with herbs and other edible plants while also look at other NBS such as green walls (keeping biodiversity in mind) and urban forests as measures for temperature regulation but also provide education ([CLEARING HOUSE publication](#), [REGREEN Factsheet, 2021](#)).
- **Inadequate funding:** The development and implementation of NBS education programmes can be costly, and many schools and organizations may not have the necessary funding to support these initiatives.
- **Lack of integration across subject areas:** While there is a trend towards cross-disciplinary approaches to education, there may still be limited integration of NBS topics across subject areas in some schools and educational institutions. For example, some English teachers might find it easy to access resources in English on NBS with worksheets, learning scenarios etc., however, in other subjects it might be more difficult.
- **Limited awareness and engagement:** There may be limited awareness and engagement among students and communities about the importance of NBS education and its potential benefits.
- **Lack of knowledge of communication:** While NBS is an umbrella concept that encompasses various sectoral and thematic areas, many research institutes and research and development projects are now investigating its potential in the context of governance, policy, and practice. However, the outcomes of these projects are often left unshared, with the knowledge

being confined to their individual targeted sectors. This poses a serious challenge to the wider mainstreaming of NBS, as respectively, the general public, policymakers and practitioners may lack the necessary understanding of its benefits and potential. In order to address this issue, it is crucial to transform the outcomes of NBS research into concise and easily digestible knowledge products that are tailored to different target audiences, including the general public, policymakers, and practitioners. Integrating art into NBS knowledge products, such as visualisation of the NBS thematic and sectoral dynamics, is one of the ways of facilitating this goal.

To overcome these challenges, policy makers and educators can consider investing in teacher training and professional development opportunities to ensure that educators have the skills and knowledge they need to effectively incorporate NBS education into their curricula. In fact, certificates for teachers trained in NBS could also act as an incentive. Additionally, efforts can be made to increase access to outdoor learning spaces, either by creating new spaces or making existing spaces more accessible. Funding mechanisms can also be explored, such as public-private partnerships or grant programmes such as ERASMUS+ mentioned previously, to support the development and implementation of NBS education initiatives. Finally, efforts can be made to raise awareness and engage communities, potentially through public outreach campaigns or youth-led initiatives with the help of youth organisations and other informal education sector stakeholders.

Impacts of integrating nature-based solutions in Education



Integrating nature-based solutions in education with a whole school approach can have a wide range of positive impacts on both students and the school community-as-a-whole. Some potential impacts include:

- Improved academic performance and wellbeing:** Research suggests that spending time in nature and incorporating natural elements into the curriculum can improve and promote learning ([Kuo.M. et.al, 2019](#)). Students who participate in outdoor learning and get exposure to nature may have improved learners' attention, lower levels of stress, self-discipline, interest and enjoyment in learning, and physical activity and fitness. A whole school approach to nature-based thinking can help to create a school culture that prioritizes student wellbeing and provides opportunities for students to connect with nature.
- Improved environmental awareness:** Incorporating nature-based solutions into the curriculum can help students develop a deeper understanding of their environment and their connection with it. This can lead to increased environmental awareness and a greater sense of environmental citizenship ([Cost Association, 2022](#)).
- Fostering Community identity:** A whole school approach for sustainability education can help to build a sense of community among students, teachers, and staff ([EC, 2022](#)). Collaborative NBS projects such as school gardens or green trails can provide opportunities for students to get hands on experience with real life situations and develop a sense of shared responsibility with a future oriented perspective.

Therefore, integrating nature-based solutions education and a whole school approach can have a range of positive impacts on student learning, wellbeing, and environmental awareness, as well as fostering a sense of community within the school. In fact, there is growing evidence and testimonials from teachers who have expressed interest in incorporating NBS in their curriculum and instead ask for a comprehensive guidance tailor made to their local contexts to do so.



Whole School approach

A whole school approach to sustainability seeks to embed learning for environmental sustainability across the institution. It adopts a systemic view of education creating opportunities for living and learning sustainability across the education environment.

Schools adopting this approach connect what students learn through the curriculum with what is practiced by the school through its management, operations and procurement as well as outreach. It is an approach that seeks to take learning outside of the classroom walls by engaging students in school decisions, involving them in community projects and global initiatives. It also encourages partnership engagement from community groups involving students in real-life experiences and actions for sustainability.

EC 2022, Input paper: A whole school approach to learning for environmental sustainability

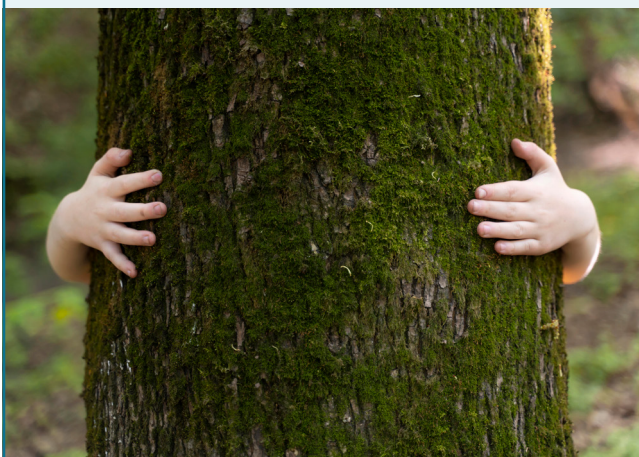


Ing. Gabriela Krížovská

English and ICT teacher at primary school, SLOVAKIA

“By teaching students about nature-

based solutions, we are not only promoting sustainable practices, but also instilling a love for nature and a sense of responsibility towards our planet. Nature-based solutions in the classrooms can help bridge the gap between environmental education and hands-on learning, giving students the tools they need to make a positive impact on the world.”



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Key Recommendations

Teacher training

Teacher training is critical in implementing optimal NBS education in schools. Teachers play a central role in shaping students' awareness, understanding and engagement with environmental and sustainability issues. Without proper training, teachers may lack the necessary knowledge, skills and competences to effectively teach NBS concepts and put them into practice for the students. Participating in training programs for teachers can help bridge this gap. One recent opportunity in this direction is the MOOC “Exploring Nature-Based Solutions In your classroom” organised by the [NBS EduWORLD](#) project with the support of [Sci-entix](#) and [Trane Technologies](#). ([European Schoolnet Academy, 2023](#)). These programs can cover a range of topics, from NBS concepts and practices to pedagogical techniques for teaching NBS and working with real-world problems to develop learning scenarios. They can also provide teachers with access to teaching materials and resources, as well as opportunities for collaboration and sharing of best practices.

The GreenComp Framework for formal school education

The GreenComp framework can support teachers in providing education on nature-based solutions and the environment in several ways:

1.) Competency development: can help teachers develop their own competencies related to sustainability education, focussing on:

1) Embodying sustainability values, 2) Embracing complexity in sustainability, 3) Envisioning sustainable futures and 4) Acting for sustainability.

2.) Curriculum integration: can support teachers in integrating nature-based solutions and sustainability education into the curriculum across various subject areas, including science, geography, and social studies but also in language training.

3.) Supportive pedagogies: can provide guidance on effective pedagogical approaches for teaching about sustainability, including gamification, role play, inquiry-based learning, project-based learning, outdoor learning and many more.

4.) Evaluating outcomes: can provide guidance on how to assess students' knowledge and skills related to sustainability, including the use of formative and summative assessment methods.



GreenComp framework

The GreenComp framework, released by the European Commission in 2022, defines a set of competences for sustainability that provide a common ground to learners and guidance to educators. It gives guidance to teachers in developing their own competencies related to sustainability education, as well as to help them integrate these competencies into their teaching practices.

Bianchi, G., Pisiotis, U. and Cabrera Giraldez, M., GreenComp The European sustainability competence framework, Punie, Y. and Bacigalupo, M. editor(s), EUR 30955 EN, Publications Office of the European Union, Luxembourg, 2022, ISBN 978-92-76-46485-3, doi:10.2760/13286, JRC128040.

More specifically, the teachers may want to identify some concrete guidance such as the following:

- **Lesson Plans** and worksheets that incorporate nature-based solutions themes and activities across various subjects, focussing on real-life scenarios and tailor made to local contexts.
- **Teaching Materials** including a wide range of teaching materials, including books, posters, and multi-media resources, to support nature-based solutions learning in the classroom.
- **Professional Development** that provides opportunities for teachers to learn about nature-based solutions for education and gain new skills, competences and knowledge to support their teaching.
- **Practical Resources** such as seeds, gardening tools, and composting equipment, to support the implementation of nature-based solutions initiatives with the students such as school gardens and green walls.
- **Networking opportunities** for teachers and schools, including mentorship and peer-to-peer exchange opportunities, to help build a community of practice around nature-based solutions teaching.

Some concrete measures that Ministries of education or other educational institutions could take and have taken to improve the understanding of nature-based solutions in schools are:

- **Developing curriculums:** Ministries of education as well as other educational institutions (even schools) could develop specific curriculums that incorporate nature-based solutions into their lessons as part of the broader education for sustainable development. Additionally, it could be helpful to establish a portal with resources directly linked to the ministries websites for each country (if not already present) as it

adds an element of legitimacy to the curriculum if it is directly informed by the Ministries of education.

- **Providing teacher training:** Providing teachers with training on how to incorporate nature-based solutions into their lessons is an effective way to improve the understanding of students. Also including certification schemes and awards for teachers and schools could motivate more teachers to adopt ESD and NBS education within their curriculum.
- **Developing tailored knowledge products and communication material:** Transforming the outcomes of NBS research into concise and easily digestible knowledge products that are tailored to different target audiences, including the general public to facilitate awareness raising towards transformative change.
- **Creating partnerships and collaborations:** educational institutions could collaborate much more with government agencies, NGOs, and private organisations to promote nature-based solutions in schools. Multi-Ministerial action plans and work programmes could harness the synergies and support more robust uptake of measures to include NBS in ESD.
- **Funding research:** Ministries of Education can provide funding for research on the benefits of nature-based solutions in education. This research can help inform the development of policies and programmes that promote nature-based solutions.
- **Establishing and promoting Green/Eco Schools:** Ministries of Education could further promote the development and uptake of Green Schools or Eco Schools programmes that encourage schools to adopt sustainable practices, including nature-based solutions.

Overall, the initiatives taken by the Ministries of education or educational institutions to improve the understanding of nature-based solutions in schools will vary depending on the region or country and their relevant agendas. For instance, the Spanish Ministry of Education has joined forces with the Ministry of Ecological Transition and Demographic Challenge to work together on an ambitious action plan for environmental education for sustainability which promotes compulsory environmental education in the nation. Assessment processes are also considered essential to ensure good implementation of the action plan. Spanish education law has also set several approaches to align curriculums to match the needs of the present societal challenges in line with the Education 2030 agenda and the European Commission's Green Comp framework. Such actions could then also incorporate and highlight the relevance of focussing on nature-based solutions education within the ESD framework.



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