From lecture halls to living labs: Tackling biodiversity loss through nature-based solutions

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Learn how to empower higher education and vocational training to address biodiversity loss through Nature-Based Solutions

Bridging the knowledge and implementation gap

Biodiversity is declining at an unprecedented rate, with about 25% of animal and plant species at risk of extinction – a trend driven primarily by human activities. [(1)] This loss threatens critical ecosystem services such as climate regulation, soil fertility, clean water, and food security. Nature-Based Solutions (NBS) provide a powerful response by simultaneously addressing biodiversity loss, climate change and societal resilience.

A central question is therefore: how can Europe equip its future workforce with the skills and mindsets needed to design, implement, and govern NBS at scale? Higher education (HE) and technical and vocational education and training (TVET) are pivotal to closing this gap. The

Decent Work in Nature Based Solutions 2024 report highlights the need to mainstream NBS related skills into education and training systems to enable a just transition and create quality green jobs. [2]

HE and TVET can shape future professionals, foster cross-sectoral collaboration, and promote transformative learning. [3] Despite strong European Union (EU) and national commitments to biodiversity and NBS – including the EU Biodiversity Strategy for 2030, the Green Deal, and the Council Recommendation on learning for the green transition – their uptake in HE and TVET remains limited.

The eNaBIS Project

The Horizon Europe project eNaBIS explores how HE and TVET can systematically integrate NBS and biodiversity into education and practice. The project aims to strengthen skills and capacities for a nature-positive society by embedding NBS concepts and practices in HE and TVET curricula and linking theoretical knowledge to hands-on applications. Seven Living Labs (LL) across Europe act as collaborative environments that bring together universities, vocational schools, professionals, and communities to co-create innovative training and curricula. It's European mapping and stakeholder consultations addressed a key question: What factors drive the gap between biodiversity and nature positive policy frameworks and their implementation in higher and TVET education?

Critical dimensions for systemic mainstreaming

This mapping exercise underpinned that implementation gaps are caused not only by missing materials or awareness, but also by system level issues such as misaligned policy cycles, weak accreditation for NBS competences, fragile embedded NBS in teaching curricula, insufficient long term funding, missing collaboration between HE and TVET, and lack of incentives for transformative innovations such as LLs. Three dimensions stand out:

1. Interdisciplinary collaboration within HE and TVET. Biodiversity and NBS cut across ecology, engineering, urban planning, economics and social sciences. Yet many institutions remain organised in disciplinary silos that hinder cross departmental teaching and research.
2. Mutual learning between HE and TVET. Universities and vocational schools often operate in parallel rather than in partnership. Joint curricula, shared LLs, and regional alliances are still the exception rather than the norm.
3. Awareness and competencies on NBS among educators and learners. Many teaching staff lack familiarity with NBS concepts, case studies and didactic tools. Learners have too few opportunities for challenge based, practice oriented engagement with real NBS projects.

Several building blocks for such an NBS oriented skills and education agenda already exist at the EU level. The policy instruments mentioned above have established sustainability and green skills as strategic priorities, and the European Sustainability Competence Framework

(GreenComp) offers a shared reference for sustainability competences. Erasmus+, Horizon Europe, ESF+ and the EU Missions already support projects on biodiversity, climate adaptation, and, in some cases, NBS.

However, NBS specific skills and LL approaches in HE and TVET are still mainly driven by individual projects rather than embedded and monitored within these EU frameworks. Making NBS education more explicit in existing strategies, guidance, and funding is therefore less a matter of inventing something new than of consolidating what is already underway.

Policy recommendations

To bridge the knowledge- implementation gap in HE and TVET and operationalise the three dimensions outlined above, comprehensive, better connected policy interventions are required.

Cross level policy frameworks should integrate NBS and biodiversity into curricula, institutional strategies and qualification standards for educators. This requires structured collaboration between HE, TVET, local communities and industry. Key levers are the inclusion of NBS in national qualification standards for teachers and institutional development plans (supporting dimensions 1 and 3).

Dedicated and sustained funding by targeted calls under Erasmus+, Horizon Europe and the European Social Fund Plus (ESF+) is needed to incentivise curriculum innovation between universities and TVET, LLs and inclusive participation (dimensions 1 and 2). Grants for student engagement, educator professional development, and reducing access barriers for underrepresented groups are equally important (dimension 3).

The implementation and scaling of LLs – real world, transdisciplinary environments involving students, educators and stakeholders – are highly effective in fostering all three dimensions. LLs operate as boundary spaces where policy aspirations can be tested against institutional realities, revealing where regulatory clarity, funding instruments, or governance support are missing.

Furthermore, educational approaches such as challenge-based learning and student-led micro-research projects might be effective tools for educating future professionals (dimension 3). A “whole institution approach” can mobilise entire campuses and has strong potential to develop transformative competences and foster systemic change at the personal and institutional levels (dimensions 1 and 3).

Robust monitoring and evaluation mechanisms are essential to measure the uptake and effectiveness of NBS education. Developing standard indicators for curriculum integration, skill acquisition and local ecological impact can support sustained policy learning and replication across regions (dimensions 1, 2 and 3).

HE and TVET are central to Europe’s nature positive transition, but still underuse the potential of NBS. Closing the gap between ambitious biodiversity policies and educational practice requires: aligned policy frameworks that embed NBS in curricula, institutional strategies and educator qualifications; sustained funding that supports HE–TVET collaboration and LL; and

robust monitoring of NBS related learning outcomes and local impacts. Combined, these measures can turn NBS from isolated projects into a mainstream element of European education and skills systems.

References

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