D5.3

Roadmap for

BIOEAST UniNet

Progress Report

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Abbreviations

BIOEAST	Central and Eastern European Initiative for Knowledge-based Agriculture, Aquaculture and Forestry in the Bioeconomy
BIOEAST UniNet	BIOEAST University Network
CEE	Central and Eastern Europe
CR HUB	BIOEAST HUB Czech Republic
D5.1 / D5.3	Deliverable 5.1 / Deliverable 5.3
EBSF-EBU	European Bioeconomy Scientific Forum – European Bioeconomy University
ERA	European Research Area
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GBS	Global Bioeconomy Summit
KPI	Key Performance Indicator
MOOC	Massive Open Online Course
NGO	Non-Governmental Organization
PPP	Public–Private Partnership
R&I	Research and Innovation
SDG	Sustainable Development Goals
SRIA	Strategic Research and Innovation Agenda
TWG BE Edu	Thematic Working Group on Bioeconomy Education
UN	United Nations
WP	Work Package

Introduction to the project

BOOST4BIOEAST *is a Coordination and Support Action funded by the European Commission developed to support the BIOEAST Initiative with the aim of empowering national stakeholders in the Central Eastern European and Baltic countries for the development of national bioeconomy action plans and to build long-lasting structures and spaces of dialogue for national and macro-regional cooperation. The project will enrich knowledge on the bioeconomy and stimulate related research and innovation across the macro-region.*

Executive Summary

This report (*Deliverable (D)5.3 - Roadmap for BIOEAST UniNet Progress Riport*) sets out a preliminary, time-bound roadmap for **Network of the Bioeconomy Universities in the BIOEAST macro-region (**BIOEAST UniNet), aiming to strengthen bioeconomy education and skills across Central and Eastern Europe (CEE). It translates the network's vision, mission and objectives into actions for the BOOST4BIOEAST project period 2025–2027 and outlines longer-term steps post-2027 to secure policy alignment, international cooperation, and financial sustainability. The roadmap was developed through consultations with members of the BIOEAST Thematic Working Group on Bioeconomy Education (TWG BE Edu), BIOEAST Uninet, BIOEAST HUBs, and events happened in the first half of 2025 and complemented by the results of *D5.1 – Ready to use education materials in bioeconomy, needs and gaps.*

The report provides a plan with Key Performance Indicators (KPIs), milestones, responsibilities and a time horizon focused to harmonise and modernise bioeconomy curricula and lifelong learning offers; build institutional capacity and cross-border collaboration; connect universities with industry and policy for innovation-driven skills; and establish governance, monitoring, and funding mechanisms that endure beyond the BOOST4BIOEAST project.

Key short-term actions (2025–2027) include the setting up of governance structures for the Uninet; completing capability mapping in at least three member universities; launching an internal repository; piloting one masters module, one micro-credential, one MOOC among the education offers; running of training-of-trainers and two summer schools, engaging policy through expert dialogues and two policy briefs; and delivering two UniNet conferences and activate an external advisory panel.

Longer-term actions (post-2027) will focus on joint accreditation, deeper institutional integration, achieving diversified funding (alumni, partnerships, national/European funding), and putting greater emphasis on building international partnerships.

With governance, pilots, and monitoring in place, BIOEAST UniNet can rapidly convert existing assets into scalable education pathways and position CEE as a knowledge-driven bioeconomy region. The roadmap is designed as a living framework: implement, learn, iterate, and scale.

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1 Introduction

The BIOEAST UniNet (https://www.bioeastuni.net/) was launched in 2022 - within the framework of the BIOEAST Initiative - to serve as a strategic educational network committed to co-developing innovative curricula, strengthening interdisciplinary research, educational responses to sustainability, economic resilience, and innovation needs and aligning educational programmes with regional sustainability goals and EU priorities. The UniNet is also a structural part of the TWG Be Edu where educators and relevant policy makers are represented from the BIOEAST macro-region to operationalize this commitment. Rooted in the shared vision articulated in its Thematic Strategic Research and Innovation Agenda (SRIA) (SRIA BE Edu, 2025), the network is instrumental in addressing the macro-region's key educational challenges: fragmented governance, limited interdisciplinary and practical training, and the underrepresentation of CEE institutions in EU research frameworks.

Developing a roadmap for the BIOEAST UniNet is a critical step in ensuring its strategic coherence, operational effectiveness, and long-term impact. The roadmap is considered a strategic planning tool that outlines the goals, steps, milestones, responsibilities needed to achieve a desired outcome put on a timeline. As a foundational document, the roadmap serves two purposes. **First,** it aligns the shared vision and goals of participating institutions, providing a common framework for defining strategic priorities and long-term objectives. Given the diversity of universities involved, spanning disciplines such as biotechnology, agronomy, policy, and economics, the roadmap helps unlock collaborative synergies, avoid duplication, and foster interdisciplinary and cross-border cooperation. **Second**, the roadmap defines concrete milestones, supporting continuous monitoring, evaluation, and adaptation. This enables BIOEAST UniNet to demonstrate progress, learn from implementation, and adjust its trajectory where necessary.

Beyond internal alignment, the roadmap also functions as an **engagement and communication tool**, helping to align external stakeholders - policymakers, industry actors, and civil society - around the network's value proposition and direction.

It is important to underline that the roadmap must align with the educational strategies and priorities of the countries where BIOEAST UniNet members are based. This alignment is indispensable not only at national level but also at macro-regional level. The TWG BE Edu places priority on guaranteeing this alignment and avoiding conflicts.

After an overview of the approach taken to develop the roadmap with various stakeholders (Chapter 2), the strategic framework underpinning the roadmap, including the vision and mission of the BIOEAST UniNet, the relevant policy context, and its objectives are presented in Chapter 3. Chapter 4 details the roadmap itself with implementation and supporting actions distinguishing between two periods:

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1. **Project period (2025–2027),** corresponding to the implementation horizon of the BOOST4BIOEAST project: actions related to governance, piloting curricula, stakeholder engagement, capacity-building, and initial policy briefs are planned for 2026, ensuring tangible outputs before the project ends.

2. **Post-project period (2027 onwards),** actions related to deeper institutional integration, international expansion, and sustainable financing are scheduled for post-2027, forming part of the broader BIOEAST framework.

The final version of the roadmap containing the update and progress check of the roadmap activities, curricula and trainings will be documented in *D5.4 - Roadmap for BIOEAST UniNet Final Report* due in M36.

2 Approach to the Roadmap

The development of the BIOEAST UniNet Roadmap followed a participatory, iterative, and evidence-informed consultation process involving key stakeholders from the BIOEAST macro-region between January – July 2025. Three major stakeholder groups were involved as key contributors to the work: a) educators; b) policymakers, mainly responsible for institutionalisation and c) end users of the educational initiative (industry actors). Educators and policy makers are represented in the BIOEAST TWG BE Edu as well. Moreover, D5.1 *Ready-to-use education materials in bioeconomy, needs and gaps* (Arancibia and Kaczmarek, 2025) outcomes were reviewed and shaped the activities. In addition, to the report review and consultations, the Uninet was represented at four in-person events between June-July 2025 where exchanges about the Uninet's strategic direction occurred informing its strategic framework. The timeline of the roadmap development process is depicted in Figure 1.

The consultations were designed to develop four main areas that now serve the backbone of the roadmap: (1) Strategic objectives, (2) Action areas and tools, (3) Activity plans with
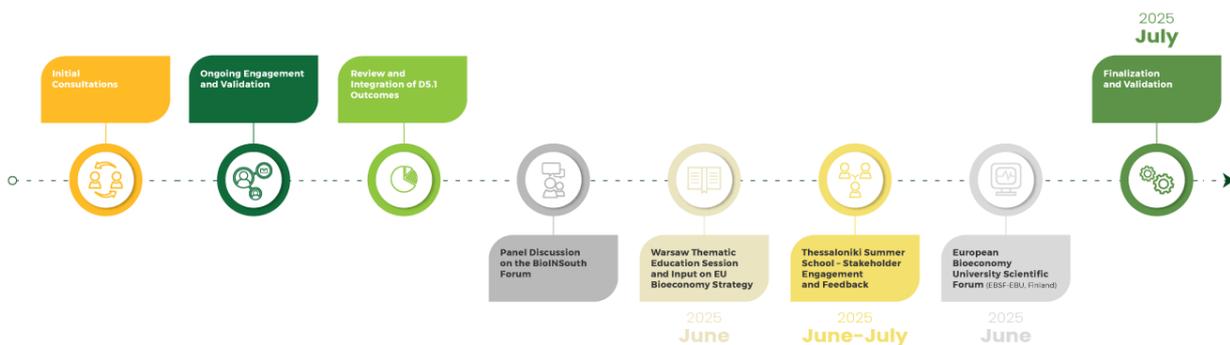
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Figure 1. Timeline of key stakeholder engagement events supporting the development of the BIOEAST UniNet Roadmap (2022–2025)

timeframes, and (4) Monitoring progress through KPIs and milestones. The aim was to ensure that the roadmap reflects actual educational needs, institutional capacities, and strategic ambitions of the region, while building on existing work and fostering stakeholder ownership.

The **key steps** of the roadmap development were as follows:

1. Initial Consultations

The process began with targeted consultations with members of the BIOEAST TWG BE Edu and representatives of the BIOEAST UniNet in January 2025. These discussions helped clarify expectations, identify institutional priorities, and define the scope and structure of the roadmap.

2. Ongoing Engagement with the Members

Between February-May 2025, efforts were made to continuously engage BIOEAST UniNet members and TWG BE Edu representatives to ensure the roadmap reflects shared goals and priorities. The iterative nature of the process allowed for successive rounds of input, discussion, and refinement.

3. Review and Integration of D5.1 Outcomes

A comprehensive review of the outcomes from D5.1 was undertaken including a gap analysis to assess the mismatch between current educational offerings and the region's emerging bioeconomy skills needs. These findings served as a foundation for structuring the roadmap's strategic and operational components.

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4. Additional side events where the Uninet was represented:

a) BioInSouth Forum - Circular Bioeconomy Builds Bridges in Catania (Italy): A panel discussion titled "T*he Circular Bioeconomy Builds Bridges: The BioSouth Initiative"* was organised between BIOEAST and BioINSouth project (https://www.bioinsouth.eu/) held in Catania (Italy) on 6 June 2025 which helped shape the roadmap especially through emphasizing the need for a cohesive, inclusive approach to bioeconomy education across Europe.

b) Research & Innovation for Natural Resource Sustainability High-Level EU-PL Presidency Conference in Warsaw (Poland): A thematic education session was organized during the high-level EU Polish Presidency Conference in Warsaw on 11 June 2025 which provided strategic insights and priorities which were directly incorporated into the roadmap, further anchoring it in regional and EU-level policy frameworks.

c) d) European Bioeconomy University Scientific Forum (EBSF-EB) in Joensuu (Finland): At the forum on 13 June 2025, the UniNet had the opportunity to present to a wide and dedicated audience its purpose, scope and draft roadmap reflecting regional requirements and particularities.

d) 7th International Summer School on Bioeconomy in Thessaloniki (Greece): One full day of the Summer School programme was dedicated to BIOEAST UniNet on 27 June 2025, during which UniNet members attended a focused presentation and discussion on the draft roadmap and subsequently shared their insights and feedback. To ensure inclusive input, the draft was also shared via a Google Document, enabling members who were unable to attend the dedicated session to contribute their perspectives.

5. Validation and Finalisation
Following the collection of feedback throughout early summer, the revised roadmap was shared with the broader BIOEAST TWG BE Edu network for validation, then was consolidated by 31 July.

3 Strategic Framework

BIOEAST UniNet operates within a robust and evolving European policy framework, reflecting high-level political, environmental, and educational priorities. The European Green Deal aims for a climate-neutral Europe by 2050 and bioeconomy education plays a crucial role in supporting the green transition, especially in agriculture, food, forestry, and waste management sectors - all prominent in the BIOEAST region (EC, 2019). At the same time, the EU's Bioeconomy Strategy (EC, 2018) emphasizes strengthening the bioeconomy across Europe by enhancing education, promoting innovation, and developing circular and sustainable value chains. It calls for mobilizing regional potential and investing in knowledge-based systems. While these ambitions are present at European level, the BIOEAST macro-region faces regional structural challenges, notably the limited maturity of the bioeconomy, insufficient cross-sector coordination, and weak human resource capacity in research, innovation, and education which

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all hinder the macro-region to effectively contribute to achieving these ambitions. The BIOEAST Foresight Report underscores education as a key driver for building high-value bio-based value chains and for shifting the region's role from a mere biomass supplier to a knowledge-driven, circular bioeconomy active hub that fosters bio-entrepreneurship (Kosír *et al.* 2021). The BIOEAST SRIA also reinforces this by calling for (BIOEAST Initiative, 2023) (1) more investments in education, training, and skills development, (2) strengthening innovation in sectors like forestry, food systems, bio-based materials, bio-waste management and freshwater bioeconomy and (3) enhancing inter-ministerial coordination and aligning education with research, market, and policy needs.

3.1 Education Needs and Gaps in the BIOEAST Macro-Region

According to the thematic study on bioeconomy education developed in frame of the BIOEASTsUP project, the macro-region faces (BIOEAST TWG BE Edu, 2022) the following challenges:

- Limited integration of bioeconomy in national curricula.

- A strong focus on traditional, discipline-specific programmes with insufficient interdisciplinary content.

- A lack of tailored vocational training and life-long learning offerings.

- A few initiatives supporting entrepreneurship and skills for innovation.

- Limited digital tools and online learning materials adapted to bioeconomy topics.

- Other TWGs reinforce the urgency of education as a cross-cutting enabler (BIOEAST Initiative, 2023):

  ➢ The Agroecology study calls for participatory, interdisciplinary approaches and improved stakeholder knowledge transfer. (BIOEAST Initiative, 2022 – Thematic Study #1)

  ➢ The Food Systems study emphasizes the need for modern education frameworks to promote healthy diets, food system resilience, and reduction of food waste (BIOEAST Initiative, 2022 – Thematic Study #3) .

  ➢ The Forestry study underlines the importance of modern forestry education, vocational training, and communication with the public (BIOEAST Initiative, 2022 – Thematic Study #4).

  ➢ The Bioenergy and Biobased Materials studies highlight gaps in workforce readiness, digital and engineering skills, and industry-academic knowledge flows (BIOEAST Initiative, 2022 – Thematic Study #6 and #7).

Moreover, an analysis of educational needs across the BIOEAST region was conducted with national HUBs between April and June 2025, together with a gap analysis, all presented in *D5.1-Ready-to-use education materials in bioeconomy, needs and gaps.* The findings highlighted the

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fragmented integration of bioeconomy-related disciplines into formal curricula, inconsistencies in interdisciplinary approaches, and limited alignment with regional sustainability challenges.

Table 1 below summarises the key gaps identified per country, based on inputs provided by the HUBs. These findings establish a critical foundation for the roadmap's implementation phase and inform the curriculum development measures presented in chapter 4.

HUB / Country	Main Gaps Identified
Bulgaria Marine & Blue Bioeconomy	Limited curricula in marine bioeconomy
Croatia Circular Bioeconomy & Waste Valorisation	Weak focus on waste valorisation and circular models
Czech Republic Biotech & Food Systems	Poor integration of biotech with food innovation
Hungary Agro-Bioeconomy	Lack of interdisciplinary training; weak link with entrepreneurship
Poland Industrial Bioeconomy	Missing link between biotech & industry
Romania Rural Bioeconomy	Weak rural bioeconomy focus
Slovakia Forestry & Materials	Insufficient focus on forestry innovation

Table 1. Education gaps identified across BIOEAST macro-region (Hub-based inputs)

Together these findings converge around a common priority: education and skills development are essential for unlocking the bioeconomy potential of the region. BIOEAST UniNet, supported by this roadmap, aims to address these challenges by aligning academic, vocational, and lifelong learning programmes with the demands of sustainable, innovation-driven transformation which will be a cornerstone of the updated TWG Be Edu SRIA.

3.2 Vision and Mission of BIOEAST UniNet

Validated by the consultations with the members of the TWG Be Edu and BIOEAST Uninet, the **vision** of BIOEAST UniNet is to become a leading educational network in the CEE countries which addresses environmental, economic, and societal challenges by:

- Covering all aspects and dimensions of a sustainable bioeconomy.
- Providing a modern educational model based on systems thinking and regional relevance.
- Adopting a governance structure guided by shared priorities.
- Fostering stakeholder collaboration, particularly with policy and industry.

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- Supporting public engagement and raising awareness.

The **mission** of UniNet is to foster a coordinated, inclusive, and region-specific approach to advancing bioeconomy education across CEE through:

- Educating a new generation of bioeconomy experts through comprehensive, interdisciplinary knowledge and skills.
- Fostering innovative, collaborative research across member universities and European partners.
- Facilitating knowledge transfer to society and the economy.
- Promoting sustainable entrepreneurship by equipping young innovators with knowledge, tools, and supportive infrastructure.

3.3 Strategic Objectives

The strategic objectives of the BIOEAST UniNet define the long-term goals and guiding principles that will shape its development, governance, and impact across the BIOEAST macro-region. They were initially formulated in 2022 in the Action Plan validated by BIOEAST UniNet members and updated in 2025 during the Roadmap preparatory phase to support the transition to a sustainable, circular, and innovation-driven bioeconomy by fostering collaboration in education, research, and stakeholder engagement.

1. Strengthen Institutional Collaboration and Governance
BIOEAST UniNet aims to become a well-coordinated and agile network, enabling structured cooperation among universities through clearly defined governance mechanisms, steering structures, and shared planning processes. This includes the formation of a Steering Committee, operational secretariat, and active working groups.

2. Align Educational Programmes with Regional and EU Priorities
The network strives to harmonize bioeconomy-related curricula and training across the region by developing joint academic programmes (e.g., MSc, PhD), micro-credentials, Massive Open Online Courses (MOOCs), and short-term courses that reflect regional sustainability challenges and align with the EU Green Deal, Bioeconomy Strategy, and Pact for Skills.

3. Build Regional Capacity and Close Knowledge Gaps
Through joint capability mapping, staff development, training-of-trainers activities, and summer schools, BIOEAST UniNet addresses the structural weaknesses in human capital, digital tools, and interdisciplinary training identified in the macro-region. Capacity-building is a cornerstone for fostering long-term resilience and innovation readiness.

4. Promote Interdisciplinary and Cross-Sectoral Research Cooperation
The UniNet supports the formation of thematic clusters and collaborative research proposals targeting Horizon Europe, Erasmus+, and other funding opportunities. Shared research infrastructure and community-of-practice networks will foster academic exchange and address complex sustainability challenges.

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5. Foster Bioeconomy Innovation and Entrepreneurship

BIOEAST UniNet will stimulate a culture of entrepreneurship and applied innovation through regional hackathons, innovation challenges, mentorship schemes, and partnerships with industry and start-ups. These activities aim to bridge academic knowledge with real-world bioeconomy applications.

6. Enhance Stakeholder Engagement and Societal Impact

The network is committed to proactive stakeholder engagement through advisory panels, annual conferences, and co-creation formats. These structures will ensure inclusiveness, policy relevance, and the societal embedding of bioeconomy education and innovation.

7. Advance Policy Dialogue and Strategic Alignment

By co-developing policy briefs, participating in EU consultations, and coordinating with national ministries, BIOEAST UniNet will contribute to policy shaping and ensure that bioeconomy education is recognised as a strategic driver of green transition in the CEE region.

8. Enable International and Cross-Regional Cooperation

The BIOEAST UniNet will develop synergies with related projects such as BioINSouth and BEAMING (https://beamingproject.eu/) and build partnerships with institutions from the Global South and other EU macro-regions to facilitate knowledge exchange and co-learning.

9. Ensure Long-Term Financial Sustainability

A key objective is to develop diverse and sustainable funding streams—through EU projects, public–private partnerships, alumni engagement, and national support—that can ensure the continuity of activities and the scalability of successful models.

10. Strengthen Communication and Visibility

BIOEAST UniNet will implement an integrated communication and dissemination strategy, leveraging digital platforms, publications, and stakeholder outreach to enhance the visibility of its mission, outcomes, and partnership opportunities.

11. Support Systemic Monitoring, Evaluation, and Learning

To ensure transparency, accountability, and continuous improvement, the UniNet will track KPIs, conduct annual reviews, and support iterative learning across all levels of implementation.

The strategic objectives in developing the Roadmap are based on vital principles such as **Knowledge Creation & Research Excellence** focusing on interdisciplinary research, promoting joint research projects, aligning agendas across the universities and ultimately creating centers of excellence. **Education & Skills Development** involves developing joint curricula, providing vocational training and enhancing talent mobility. **Sustainability & Societal Impact** and finally **Networking & Internationalization** aim to promote partnerships, leverage funding opportunities and influence policymakers.

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4 Roadmap

Building on the strategic foundation outlined in the previous chapter, this chapter presents the concrete steps and actions proposed to operationalize the BIOEAST UniNet in form of a roadmap. The roadmap is structured around a two-phased approach, distinguishing between immediate actions for the remaining two years (2025–2027) pf the BOOST4BIOEAST project and longer-term actions (beyond 2027). These steps are designed to ensure institutional coordination, curriculum innovation, capacity-building, and policy alignment—all tailored to the educational needs and strengths of the BIOEAST macro-region.

As part of the roadmap development, the potential audience with specific interest or roles in future implementation has been identified (see in Table 2).

Audience	Interest / Role
University leadership	Strategic alignment, resource commitment, academic planning.
Faculty and researchers	Research priorities, collaboration opportunities, research commercialization.
Students and young researchers	Training programmes, career pathways in bioeconomy.
Government & policy makers	Policy alignment, funding, national/regional development goals.
Industry partners	Innovation collaboration, talent pipeline, market relevance, legislative actions, facilitating knowledge transfer.
Funding agencies	Project justification, long-term impact, strategic alignment
International organisations (e.g. Food and Agriculture Organization (FAO), Organisation for Economic Co-operation and Development (OECD), EU)	Global sustainability goals, Sustainable Development Goals (SDG) alignment, capacity building.
Civil society / Non-Governmental Organizations (NGOs)	Transparency, inclusion, relevance to local needs, matchmaking, value chains.

Table 2. The audience of the roadmap

Each action area includes associated KPIs and implementation milestones, which together form the operational backbone of the roadmap. The tools to be used for implementation will vary depending on the action area. These include capacity-building programmes (training-of-trainers, summer schools, short courses), networking instruments (annual conferences, advisory panels, joint academic modules), digital tools (MOOCs, repositories, online platforms), and stakeholder engagement formats (policy dialogues, hackathons, innovation challenges). The detailed roadmap is presented in Table 2.

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ACTION AREA	DESCRIPTION	KEY PERFORMANCE INDICATORS (KPIs)	TIME HORIZON
1 Governance & Coordination	*Establish the Steering Committee and Coordination Team, define governance rules, working groups, and decision-making processes.*	*- Steering Committee established, - Secretariat operational, - Governance charter adopted by BIOEAST UniNet members.*	*since Dec 2024 ongoing*
2 Strategic Document Finalization	*Publish the Roadmap aligned with national and EU frameworks, discuss it during one of the science-policy dialogues organized by TWG Be Edu*	*- Roadmap published and disseminated, - Endorsement by at least two national ministries or authorities.*	*until Dec 2026*
3 Capability Mapping	*Conduct institutional audits: curricula, infrastructure, expertise. Launch internal repository.*	*- Institutional audits completed at least in three universities*	*June 2027*
4 Stakeholder Engagement	*Host yearly UniNet Conference and establish advisory panels (policy, industry, civil society).*	*- Two conferences organized, - One advisory panels established, - 20+ external stakeholders engaged.*	*since 2023*
5 Joint Academic Programmes	*Develop joint MSc/PhD modules; harmonize syllabi; co-develop shared MOOCs and micro-credentials.*	*- One MSc modules piloted, - One micro-credentials co-developed, - One MOOC launched.*	*July 2027*
6 Collaborative Research	*Form thematic clusters; initiate joint funding proposals; pilot joint community practice networks in cooperation with BEAMING project.*	*- Two joint Horizon/Erasmus+ proposals submitted, - Two thematic community of practice groups active.*	*one accomplished in Sep 2025, 2nd till December 2026, 4 thematic CoPs have been launched (BEAMING project)*
7 Innovation & Entrepreneurship	*Support Open Innovation Challenge organized in BOOST4BIOEAST project.*	*- Disseminate Open Innovation Challenge among universities, -One startup-to-investor pitching event organized in Prague.*	*November 2025; By May 2026*

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8	**Capacity Building**	*Deliver training-of-trainers, short courses, staff exchanges, and summer schools.*	- Two summer schools held, - 30+ participants trained.	*1st summer school July 2025, 2nd till Sep 2026*
9	**Policy Engagement**	*Support, co-produce policy briefs; participate in EU consultations; coordinate with ministries in TWG Be Edu*	- One input submitted to 2 EU-level consultations, - Two policy briefs published.	*December 2026*
10	**South–South & Cross-Regional Cooperation**	*Launch joint dialogues with BioINSouth, BEAMING project etc.*	- One event co-hosted, - Two bilateral MoUs signed.	*December 2026*
11	**Sustainability & Funding**	*Identify long-term financial strategies (e.g., alumni fundraising, biobased industry PPPs).*	- One sustainability strategy developed.	*December 2026*
12	**Communication & Dissemination**	*Launch portal; produce newsletters, articles, videos, and social media outreach.*	- Website updated, - Two newsletters issued, - 5+ media posts/quarter.	*By June 2025*
13	**Monitoring, Evaluation & Learning**	*Monitor KPIs and provide feedback tools; conduct annual review.*	- KPIs tracked, - One annual report published.	*December 2026*

Table 1. BIOEAST UniNet Roadmap

Key responsibilities:

As the Task Leader and coordinator of the BIOEAST UniNet, **CR HUB** is responsible primarily to organise the implementation and quality assurance of the roadmap with support from rotating yearly presidencies and the **active participation from the members of the BIOEAST UniNet and TWG Be Edu.** National **BIOEAST HUBs are supporting** implementation if needed.

4.1 Phase 1 (2025-27)

Immediate actions are mandatory steps to enable effective implementation of the strategic objectives described above. They are intended to be adopted in first period of implementation, and they are elaborated analyzed by the BOOST4BIOEAST project and provided to the members of the BIOEAST UniNet. However, the final implementation from the side of the universities cannot be a commitment of the BOOST4BIOEAST project.

The roadmap's initial implementation steps are highly actionable. They emphasize agile coordination and use of available tools and content, particularly the *ready-to-use* educational materials collected in D5.1. These materials provide a valuable opportunity to kick-start curriculum development and pilot training without requiring full-scale redesign. D5.1 includes

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educational content on bioeconomy entrepreneurship, circular economy principles, funding instruments, and risk-benefit analysis. These can be directly used to:

- Integrate into master-level modules on sustainable innovation in bioeconomy.

- Serve as core content for vocational training or lifelong learning seminars.

- Pilot micro-credential programmes on bioeconomy funding and investment or circular business models.

- Inspire challenge-based learning formats, where students apply content from D5.1 to real-life regional problems (e.g., developing bio-based solutions for local food or forestry sectors).

Each institution within BIOEAST UniNet is encouraged to identify one to two modules or short courses where these materials can be immediately applied, either in formal curricula or in informal education pathways. Feedback from such pilots will inform further curriculum development and regional scaling, such as:

- Development of modular curricula on sustainable bioeconomy that can be embedded into MSc and PhD programmes across the macro-region.

- Creation of short-cycle, practice-oriented courses for vocational education and lifelong learning, with particular focus on SMEs and rural actors.

- Design and delivery of MOOCs addressing bioeconomy entrepreneurship, circular economy, and bio-based innovation, co-branded by multiple UniNet universities.

- Integration of challenge-based and project-based learning approaches, linking students directly with regional industry problems and policy priorities.

- Pilot accreditation of joint micro-credentials, enabling flexible learning pathways and cross-border recognition.

To date, diverse inputs have been received from the BIOEAST HUBs, leading to detailed proposals for potential curriculum development measures. The curriculum proposals presented below (Table 4) directly respond to the educational gaps identified in section 3.1 (Table 1) and are recommended as preparatory actions for the pilot phase.

Hub / Country	Proposed Contents / Adjustments
Bulgaria Marine & Blue Bioeconomy	MSc Marine Biotechnology; Vocational on fisheries; Executive training on Blue Bioeconomy innovation
Croatia Circular Bioeconomy & Waste Valorisation	Circular Economy module; Vocational on biowaste; Postgraduate course on Policy & Law

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Czech Republic Biotech & Food Systems	MSc Food Biotechnology; Short course on Food Regulation; Vocational program on safe food production
Hungary Agro-Bioeconomy	Sustainable Agriculture & Circular Bioeconomy module; Bio-mass valorisation vocational training; Entrepreneurship short course
Poland Industrial Bioeconomy	MSc on Biotechnology for Industry; Vocational on Industrial Symbiosis; Executive course on Policy & Business Interfaces
Romania Rural Bioeconomy	MSc on Rural Development & Bioeconomy; Vocational for farmers (biogas/biomass); Online course on rural entrepreneurship
Slovakia Forestry & Materials	Sustainable Forestry module; MSc Bio-based Materials; Vocational on wood residues

Table 2. Curriculum proposals for the HUBs

Expected Outcomes:

A harmonised yet context-sensitive set of **bioeconomy curricula recommendations** per HUB.

- Strengthened **capacity of universities and vocational institutions** to deliver relevant training.
- Increased **regional alignment** of bioeconomy education policies.
- Foundations for long-term **knowledge exchange and cooperation** across the BIOEAST region.
- Enhancement of cooperation with the industry and the private sector in general.

4.2 Phase 2 (beyond 2027)

The long-term activities are included to provide strategic continuity beyond the BOOST4BIOEAST project and to reflect the role of BIOEAST UniNet as recognised in the new EU Bioeconomy Strategy.

In the long term, BIOEAST UniNet aims to mainstream its activities by embedding bioeconomy education into national systems, strengthening policy influence, and expanding international cooperation. Achieving this will require deep institutional integration, sustainable financing mechanisms, and an enhanced leadership role at regional and EU level.

Key actions include from the roadmap:

- **Institutional Integration** – Embedding bioeconomy education into national higher education frameworks to ensure long-term ownership; developing joint accreditation for micro-credentials and degrees; aligning with the EU Pact for Skills and green transition policies; expanding partnerships to Latin America, Africa, and Southeast Asia;

and co-organizing international events with Food and Agriculture Organization (FAO), Global Bioeconomy Summit (GBS), UNESCO, and regional networks.

- **Sustainable Financing** – Establishing an alumni network and fundraising platform; securing national and EU-level funding; and launching public–private investment mechanisms focused on bioeconomy innovation.

- **Policy Impact and Leadership** – Publishing joint policy reports with TWG BE Edu; representing the region in strategic EU policy platforms; and co-organizing a High-Level Education Conference during the January-June 2027 Lithuanian EU Presidency.

4 Recommendations

The following recommendations are preliminary formulated to ensure that the roadmap is not just a document but a **living framework**—linking education, research, innovation, and policy, while producing tangible benefits for students, regions, and the bioeconomy sector. There recommendations will be further concretized in D5.4

1. Strengthening Education & Training: should include the development of specific curricula and the alignment of educational programmes with all bioeconomy disciplines, the mobility of students and teachers within the UniNet and internationally, and lifelong learning priorities including micro-credentials, and online modules for specific audiences.

2. New Curricula across the BIOEAST: For the development of new curricula a) macro-region-specific modules based on the needs of the involved stakeholders, b) challenge and practice -based learning ensuring real regional cases, and c) accreditation and recognition pathways within the UniNet should be considered.

3. Building Research & Innovation Capacity: Besides, giving priority to the development of new or strengthening of already existing joint research platforms on specific topics (e.g., bio-based materials, sustainable agriculture, biorefineries), the sharing of infrastructure and the involvement of the students in research and innovation and European projects is important. Finally, supporting start-ups, incubators and accelerators tailored to bio-based entrepreneurship at university level is essential and more internal funding should be mobilized for that.

4. General Recommendation for the Effective Implementation of the Roadmap: To ensure that the roadmap becomes a living document, BIOEAST UniNet should adopt an implementation framework based on accountability, sequencing, and transparent monitoring, including annual monitoring cycles comprising an end-year implementation report, and the set-up of working groups if needed and on a case-by-case basis.

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6 Conclusion

The BIOEAST UniNet roadmap serves as both a practical guide and a strategic vision for building a future-proof educational network that addresses the urgent needs and transformative potential of the bioeconomy in the CEE macro-region. Developed through a participatory process, this roadmap outlines an actionable path toward stronger institutional coordination, interdisciplinary curriculum development, cross-sector collaboration, and long-term policy engagement.

By dividing implementation into short-term (2025–2027) and long-term (post-2027) phases, the roadmap supports agile, yet scalable interventions. The first two years focus on governance setup, stakeholder mobilization, curriculum pilots, and leveraging ready-to-use materials from D5.1. These immediate actions enable BIOEAST UniNet members to quickly apply knowledge, test new formats, and generate feedback for broader regional deployment, therefore bridging early momentum with sustainable growth.

The long-term objectives envision a mature network embedded within national higher education frameworks, aligned with EU skills agendas, and engaged internationally through cooperation with partners from other global regions. Initiatives such as joint accreditation, structured alumni networks, sustainable financing, and high-level policy advocacy are crucial for elevating BIOEAST UniNet into a recognized force for education-driven transformation.

Importantly, this roadmap is not static, it is designed to evolve through continuous feedback, learning, and adaptation. Institutions are encouraged to take ownership of specific actions, share experiences, and co-create next steps. Success will depend on the sustained commitment of universities, ministries, and industry actors working together to shape the knowledge ecosystem for a circular, regenerative, and inclusive bioeconomy in Europe.

BIOEAST UniNet's roadmap is not only a technical blueprint but a collaborative engine for systemic change aimed at training future bioeconomy leaders, advancing sustainable innovations, and shaping policy for a more resilient and circular bioeconomy in the CEE region.

A progress report and an update of this roadmap with more concrete recommendations will be presented in D5.4 due in M36.

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7 References

Aranciaba, A. and Kaczmarek, F. 2025. Ready-to-use education materials in bioeconomy, needs and gaps. BOOST4BIOEAST project deliverable 5.1. Downloadable online: https://bioeast.eu/download/deliverable-1-5-report-on-preparing-the-national-platforms-for-bioeconomy-strategies-development-pdf/

BEAMING project website: https://beamingproject.eu/

BIOEAST Initiative. 2022. Strategic Research and Innovation Agenda – Bioeconomy Education (SRIA BE Edu). Available online: https://bioeast.eu/wp-content/uploads/2024/08/BIOEAST-Strategic-Research-and-Innovation-Agenda-SRIA.-2022.pdf

BIOEAST Initiative. 2022. Socio-ecological indicators of agroecology systems in the BIOEAST countries (Thematic Study #1 – Agroecology). Available online: https://bioeast.eu/thematic-studies-of-the-bioeast-thematic-working-groups-are-now-available/

BIOEAST Initiative. 2022. Bioeconomy education in the BIOEAST countries (Thematic Study #2 – Bioeconomy Education). Available online: https://bioeast.eu/thematic-studies-of-the-bioeast-thematic-working-groups-are-now-available/

BIOEAST Initiative. 2022. Outlook on small farming production in BIOEAST countries and local food systems of alternative futures (Thematic Study #3 – Food Systems). Available online: https://bioeast.eu/thematic-studies-of-the-bioeast-thematic-working-groups-are-now-available/

BIOEAST Initiative. 2022. Exploring areas with high agroforestry potential in BIOEAST countries (Thematic Study #4 – Forestry). Available online: https://bioeast.eu/thematic-studies-of-the-bioeast-thematic-working-groups-are-now-available/

BIOEAST Initiative. 2022. Anaerobic digestion for renewable energy, carbon sink and organic fertilizers as an integral part of bioeconomy development (Thematic Study #6 – Bioenergy & New Value-Added Materials). Available online: https://bioeast.eu/thematic-studies-of-the-bioeast-thematic-working-groups-are-now-available/

BIOEAST Initiative. 2022. Bio-based materials in Europe: stakeholder mapping, projects & private sector dynamics, policy analysis & recommendations (Thematic Study #7 – Advanced Bio-based Materials). Available online: https://bioeast.eu/thematic-studies-of-the-bioeast-thematic-working-groups-are-now-available/

BIOEASTsUP (archived) project website. Available online: https://bioeast.eu/bioeastsup/,

BOOST4BIOEAST – Boosting the bioeconomy transformation for the BIOEAST macro-region
Deliverable 5.3 - Roadmap for BIOEAST UniNet Progress Report

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BIOEASTsUP. 2021. Thematic Study on Bioeconomy Education in the BIOEAST Macro-Region. Downloadable online: https://www.bioeasthub.cz/images/doc/TWG/Thematic_Study_BE_Edu_compressed.pdf

BOOST4BIOEAST project website: https://bioeast.eu/

BioINSouth project website: https://www.bioinsouth.eu/

European Bioeconomy University. 2025. Scientific Forum Proceedings. (Finland, internal material)

European Commission. 2018. A Sustainable Bioeconomy for Europe: Strengthening the connection between economy, society and the environment. COM (2018) 673 final. Available online: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52018DC0673

European Commission. 2025. Strategic Framework for a Competitive and Sustainable EU Bioeconomy. COM (2025) 960 final. Available online: https://environment.ec.europa.eu/document/download/dbf8d2ba-9332-4f7a-b336-f356fa4b7236_en?filename=COM_2025_960_1_EN_ACT_part1_v10_0.pdf

Košir, L. G., Sakellaris, G., Popp, J., Zimniewska, M. and Värnik, R. 2021. BIOEAST Foresight Exercise Sustainable Bioeconomies towards 2050. doi: 10.13140/RG.2.2.31865.19049

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