



ERASMUS+

KA2: Cooperation for innovation and the
exchange of good practices

Knowledge Alliance Project

University – Business Alliance in
Modern Biotechnology Approaches for
Climate Change Mitigation Solutions

BIO-Save at a glance



BIO-Save

621492-EPP-1-2020-1-BG-EPPKA2-KA



This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



Co-funded by the
Erasmus+ Programme
of the European Union



BIO-SAVE: WHO ARE WE AND WHAT ARE WE AIMING AT?


Progress is impossible without change, and those who cannot change their minds cannot change anything.


George Bernard Shaw

BIO-Save initiative teams up experienced researchers and higher education professionals:

- With advanced expertise in **biotechnology**, cell biology, molecular biology, **environmental protection**, climate studies, **educational management**,
- Working in four **universities**, four **SMEs** and two **NGOs**, and
- Coming from four EU member countries - **Bulgaria, Italy, Greece and Slovenia**, and one associated country – **Turkey**,
- And facing challenges in the form of demographic pressure and needs to address the high level of youth unemployment which is a source of social instability, and to respond to the high demand for professional workers with advance expertise.

BIO-Save strives:


- To **bridge the gap** between teaching in the **academic** institutions and the need for educated professionals in the biotech **business**.
 - To promote the **best practices** in modern biotechnology research.
 - To boost **innovation** in the biotech education and business through establishing an innovative programme in “**Modern biotechnology approaches for climate change mitigation**”.
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- To implement **advanced knowledge** and **skills** to stimulate the shift of the EU education towards **smart and green competences**.
 - To **improve the quality of education** for **students, teachers** and **practitioners** with up-to-date knowledge in climate protective biotechnology approaches through **ICT-based** flexible, transferable **Learning Outcomes** and **Learning Pathways** with the ultimate aim to build a **competence-based learning system**.
 - To contribute to the (re)training of the workforce to answer the **Industry 4.0** requirements for digital transformation of the economy, the business, and ultimately – our life.

BIO-Save initiative stands on three **pillars**:

- Linking higher education, research and business for excellence and regional development.
- Stimulating the development of entrepreneurial and creative skills to promote innovation in higher education through interactive learning environment.
- Improving skills for development of the biotech sector.

BIO-Save team **steps on** the excellent results of the **ECO-Center** and **Bio-FIT projects** – whose participants are our partners – by:

- Emphasizing the latest developments in research on clean environment and bio-fertilizer technologies.
 - Transferring the outputs to new geographical regions – Turkey, Italy and Slovenia.
 - Furthering the need for introducing green-biotechnology principles into the agricultural sector.
 - Upgrading the free-access multilingual educational programmes through application of EQF/HE strategic system for organization of a training process.
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THE BEGINNING: KNOWLEDGE IS POWER

Science is the knowledge of consequences and dependence of one fact upon another.

Thomas Hobbes

FACING CLIMATE CHANGE


Biosafety is a major issue of global security which relates to various fields such as health, agriculture, security, science and technology, and education. **Biosecurity** is defined by the Food and Agriculture Organization of the United Nations (FAO) as

a strategic and integrated approach that encompasses the policy and regulatory frameworks (including instruments and activities) for analysing and managing relevant risks to human, animal and plant life and health, and associated risks to the environment.

The analysis of the state-of-the-art in biotechnology applied to climate challenges revealed that technologies employed are based on basic knowledge in genomics, genetics, and molecular biology. However, there is a **shortage of high-level skills** and **advanced knowledge** in the field, and **incompleteness** of national and sector-specific **scientific data**.

Further study of the competences of the BIO-Save target groups showed that higher education organisations needed specialized biotech knowledge and skills in many advanced domains which additionally highlighted a **gap in the labour market**. It was estimated that about **80% of the biotech companies and environmental organisations would need much more higher educated professionals in the near future**.

The BIO-Save desk research indicated that the lack of knowledge in advanced biotechnology for climate protection and the dire need for skilled professionals also **hinder the green economic growth**.



Aiming to close the gap, the BIO-Save initiative brings together junior researchers (postgraduates) and experienced professionals (academics and practitioners) to exchange knowledge and **unlock the potential** of the target groups.

HIGHER EDUCATION VS. BUSINESS

Education has always been influenced by business. Globally, companies with different economic activities are contributing to education in diverse manners.


Companies are becoming partners to Universities tackling important issues of education and shaping their strategies; hence, they are shaping the future work-power with graduate employability skills, vital in the industry endurance in an increasingly competitive world market.

Education, on its turn, has penetrated the business world in multiple and various forms. **Higher education** is offering to **business work-based learning** - the most common practice aiming, in a long-term prospect, to create a new era for businesses. Recently, there is a huge change in businesses – the digitalization of the systems and the strategies resulted in innovations implementation and production

and services speed up. Logically, a huge change in operations is registered that demands young employees and potential entrepreneurs and business owners to possess **digital skills and competencies**.

The long-term policy of the EU to promote innovation capacity of higher education and business, is aimed at **facilitating the circular economy** to achieve **sustainable growth** and **climate solutions**.

However, there is a continuous **mismatch** between teaching in the academy and the requirements of the job market with respect to:

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- The **distance between the knowledge gained in the biotech educational programmes and the skills expected by the labour market** in biotech sector related to climate change prevention, which the EU recognizes as the prerequisite for growth and job creation.
 - The **lack of entrepreneurial and strategic skills** in modern biotechnology that is behind the need to implement a sustainable EU climate strategy for economic and societal development.
 - The **gaps in addressing the socio-economic challenges** linked to climate changes and education in biotechnology to reduce the harmful effects on the environment.

This mismatch can be filled by the **work-based learning**, focused on **enhancing digital skills** and competencies. In this way, young employees will have the opportunity to receive training within their work environment, and the older ones will learn how to use modern, digital systems that pave the route to the modern age. Meanwhile, young graduates, especially apprentices can master their skills and competencies, widen their horizons, and choose their own career.

BIO-Save generates business ideas

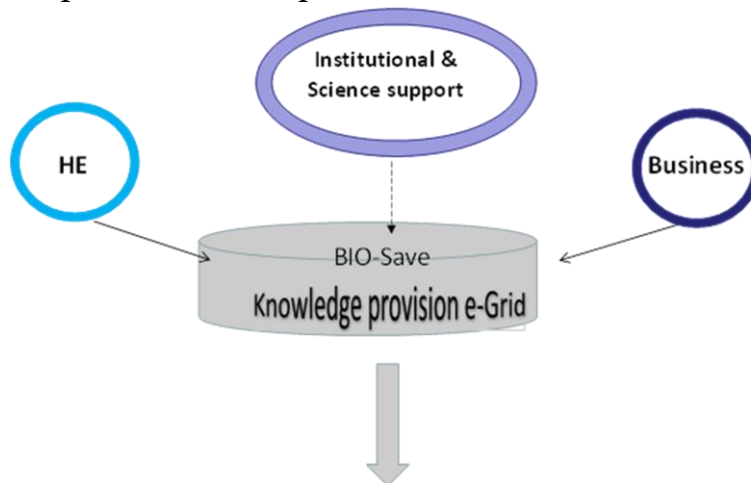
BIO-Save is creating the tools needed in order its targets to be able to learn and acquire new skills and competencies in an easy and a pleasant way. It takes on business ideas and translates them into:

- **Training content** in suitable learning format for HE graduates on how to develop ideas and training for academic professionals, and how to support them with mentoring;
- Real opportunities for **developing individual/joint business ideas** and sharing them with the commercial community;
- Prospects for HE graduates to **join entrepreneurs' community** providing them an insight into the future of the economy.

BIO Save supports education in business

BIO Save is focused on sharing best practices and developing new strategies about the management of education and creative enterprises sectors. It fosters closer engagements by promoting a better understanding of the:

- Role of the different professionals involved in BIO-Save implementation;
- Practices implemented to strengthen cooperation between tutors and trainees to improve the quality of HE, its responsiveness to the labor market needs and assurance of high-quality learning experiences;
- Practices implemented to empower trainees in HE & Business.



BIO-SAVE: THE TARGET GROUPS

Human capital is the key to growth.

WHAT ARE OUR TARGET GROUPS?

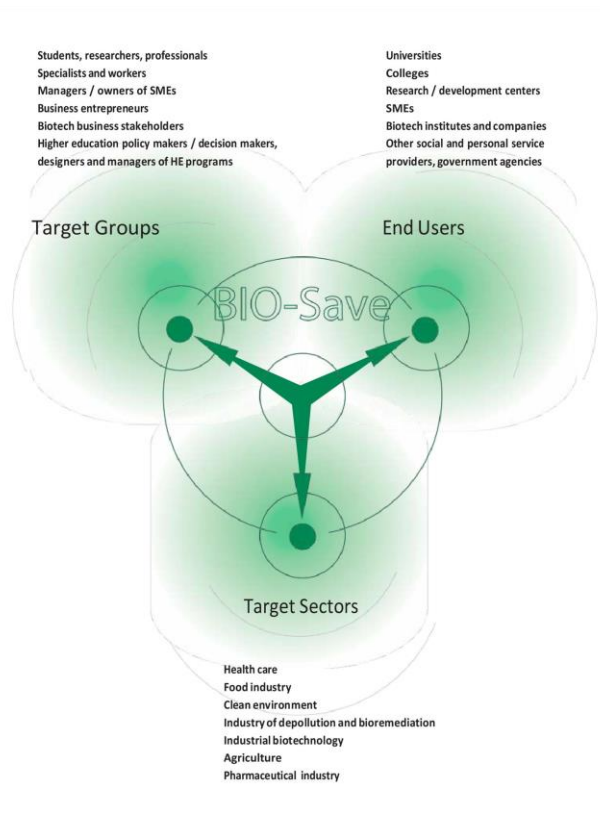
BIO-Save offers innovative content and qualifications to:

- Higher education institutions

- Students, researchers and professionals
- Biotech companies and SMEs
- Non-governmental organisations
- Business stakeholders

Active in:

- Healthcare
- Food and agricultural sectors
- Pharmaceutical industry
- Environmental industry
- Biotech business





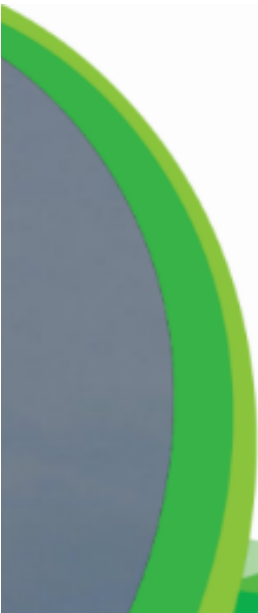

To its partners and the trainers in higher education, the BIO-Save offers:

- International strategy and biotech profiling in respect to modern biotechnologies for climate change mitigation.
- Upgraded leadership, delivery, entrepreneurship and mentoring skills.
- Better positioning of partners locally and at European level for audience development (both in training and research).
- An active network of biotech SMEs and enterprises and universities for accreditation and validation of the BIO-Save innovative programme.
- Reshaped HE curricula to answer the Industry 4.0 needs
- Digital resources to stimulate the interest of the students and trainers.
- Updated innovative educational modules to provide novel knowledge and experience on approaches for climate change mitigation.
- Involvement of the target audience into the BIO-Save educational offers.

To its associated partners, the BIO-Save offers:

- Stronger awareness of the collaboration between academia and business.
- Upgraded innovative biotech programmes for climate protection.
- Increased networking opportunities.

To biotech practitioners and their organisations, the BIO-Save offers:

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- Advanced strategic thinking toward innovations in biotech for climate protection.
 - Experience in entrepreneurship, mentoring and coaching skills by working closely with students.
 - Improved business profile on the global market and the best possible trainees' experience and efficient investment in staff time and facilities.
 - Access to relevant resources, incl. digital and case studies within the sector.
- 



To post-graduate students, the BIO-Save offers:

- Awareness of the real needs of the biotech sector.
- Improved entrepreneurship thinking and soft skills.
- Increased employment prospects.
- Enhanced opportunities on the global biotech market.

BIO-SAVE: EUROPEAN ADDED VALUE


Not adding value is the same as taking it away.

Seth Godin

HOW DOES BIO-SAVE MAKE A DIFFERENCE?


BIO-Save promotes **smart, sustainable** and **inclusive growth** in the European Union by adopting a transnational approach to address:

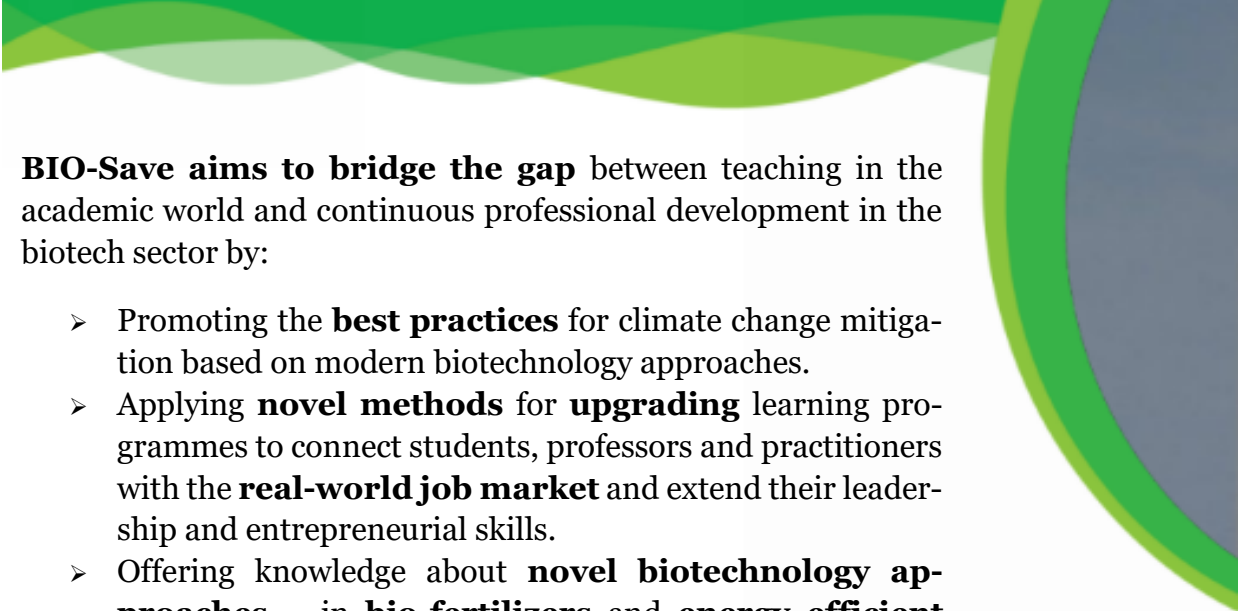
- *Sustainability:* Post-graduate students and biotech practitioners are often passion-driven and lack entrepreneurial mindset so the BIO-Save programme provides them with entrepreneurial skills in order to make the biotech sector more sustainable.
- *Skills and Mobility:* The rapidly changing climate and environment require the professionals to be equipped with: entrepreneurial and networking skills to make them more competitive internationally, and digital skills to acquire much needed competences and expand their professional knowledge. To fit contemporary European teaching standards based rather on competences than on job profiles the new trends of Education 4.0 will be applied that align human to technology and offer competence-oriented learning process and Industry 4.0-oriented skills to gain these competences.

- 
- *Cooperation:* To support the sustainability of the university-business educational model, the BIO-Save international cooperation expands the scope of knowledge and skills exchange and benefits to provide opportunities for countries to share expertise with the aim to improve their higher education systems and increase the quality and skills offered by the biotech study programmes.
 - *Intersectoral relations:* The main benefits from the European-wide cooperation between the academia and the business for working on the BIO-Save Knowledge Alliance model are:
 - Strengthening the countries' higher education institutions and recognition of qualifications and certification.
 - Reinforcing the supply of skilled biotech professionals.
 - Modernising the higher education systems in line with the innovations in biotechnology and digitisation.

BIO-SAVE: CHALLENGES AND SOLUTIONS

BIO-SAVE aims to meet the need for existing and emerging knowledge in climate change prevention by:

- 
- Establishing **knowledge alliances** between academics and practitioners.
 - Integrating mutual knowledge exchanging practices, skills and approaches to **respond to the labour market's needs** and changes in society imposed by Industry 4.0.
 - Creating tangible products which are **ICT-based** and employ new **3D interactive** education solutions.
 - Building **transnational cooperation** and best educational practices to raise the business opportunity in biotechnology and climate studies.
 - Creating added value by introducing **innovations** into higher education, entrepreneurship and business at EU and national level.




BIO-Save aims to bridge the gap between teaching in the academic world and continuous professional development in the biotech sector by:

- Promoting the **best practices** for climate change mitigation based on modern biotechnology approaches.
- Applying **novel methods** for **upgrading** learning programmes to connect students, professors and practitioners with the **real-world job market** and extend their leadership and entrepreneurial skills.
- Offering knowledge about **novel biotechnology approaches** – in **bio-fertilizers** and **energy efficient farming** – which are among the options to respond to respond to climate change.
- Proposing **hands-on experience with technology solutions** – omics, system biology, among others.

BIO-SAVE: IN SEARCH FOR NEW COMPETENCES

The BIO-Save methods relate to:

- **Digital** design and **cloud** technology;
 - Testing and implementation of **innovative practices** in biotechnology;
 - Novel skills in information technology including **3D interactive education images**;
 - Use of **new materials** and products;
 - Managing **new solutions** for recognition and validation of the knowledge, skills and competences acquired via EQF/NQF/HE instruments;
 - Building of pilot training skills and **green competency** in the European Higher Education Area;
 - Promotion of **cooperation** among regional authorities for efficient education.
- 



The BIO-Save approach provides training in:

- Modern **sustainable technologies** in biotechnology - 3D-printing, genomics, nanotechnology and synthetic biology.
- Specific skills for handling new **advanced** biotech technologies.
- **Risks** posed by modern biotechnology.
- The new eco-friendly **green use** of agro-chemicals which reduce pesticides through the deployment of genes conferring **resistance** or **tolerance** to biotic and abiotic stresses.
- Assessment and monitoring of **eco-friendly technologies** in addressing climate change.

The BIO-Save innovative differentiators involve:

- **Blending** of different learning tools.
 - Creation of “**formal**” **hard-skill courses and resources** involving the university and the business sector.
 - Hosting **peer-to-peer learning** opportunities, such as the “action learning” approach.
 - Offering **online support**, a learning programme, a hub of **cloud-based** digital resources.
- Organising events across the EU to address the new opportunities for **networking**.
 - Developing a creativity-led **web-based application** as the basis for a diagnostic tool kit, a **repository** of learning objects, and provision of **personalised** learning.



BIO-SAVE TANGIBLE OUTPUTS

Learning is a treasure that will follow its owner everywhere.

- *Chinese Proverb*

BIO-SAVE CLOUD-BASED WEB PORTAL

Coordinators: Initut, Sofia University

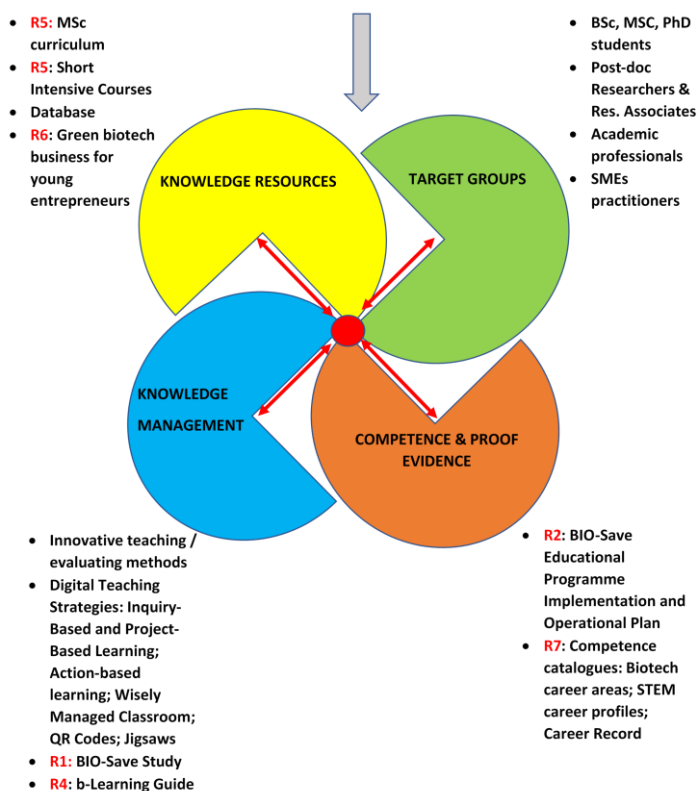
Type: online and offline courses


Medium: On the web

Languages: English, Bulgarian, Turkish, Greek, Italian

BIO-Save cloud-based web portal aims at:

- Making the training content **more alive**.
- **Visualising** the relations in biological structures.



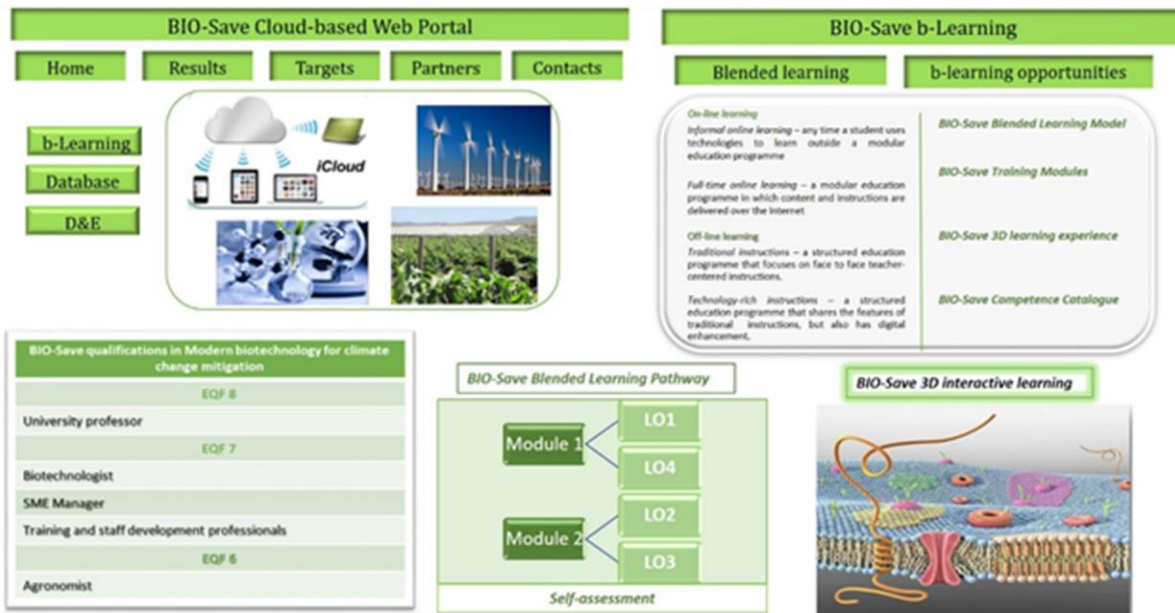
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- Applying the **b-learning cloud-based management system (b-LMS)** which is:
 - More **secure** – it continuously scans for vulnerabilities and penetration attempts and monitors for prohibited behaviour to guarantee the system security and data integrity and to prevent data breach.
 - More **scalable** – it has the benefits of elastic IPs and load balancers over multiple regions.
 - **Faster** – the cloud-based solution guarantees higher upload and download speed.
 - More **reliable** – the cloud grants 24/7 full-service access.
 - Supporting **automated data backup** – data consistency is guaranteed by automated cloud data backup services.
 - Based on the **Web Site Design Method (WSDM)**.

BIO-Save web portal hosts the **BIO-Save b-learning platform** that is:

- An open-source learning tool which functions as a **flexible e-medium** to provide competence-based blended learning, knowledge database and experience exchange platform that hosts the BIO-Save results:
- **BIO-Save Presentation** which introduces the modern biotechnology approaches for climate change mitigation and the BIO-Save opportunities and partners.
 - **BIO-Save b-Learning** which is aimed at the target groups – students, professors and biotech practitioners – to provide them with learning opportunities tailored to their needs:
 - **BIO-Save Blended Learning Model** describes the optimal mix of learning methods and specific content, provided by the BIO-Save team.
 - **BIO-Save Training Modules** give the content in partners' languages.
 - **BIO-Save 3D learning experience** employs 3D educational images for each major topic.
 - **BIO-Save Competence Catalogue** offers the BIO-Save qualification scheme which includes career profiles and competence records.

The BIO-Save project database hosts EU and national data about research and education in the project research area, with links to relevant legal, scientific and social documents and information about important events.

The BIO-Save dissemination and exploitation during project and post-project life ensure the **transferability** of the BIO-Save results and its **sustainable impact** (incl. by giving information about events and links to social media profiles).





BIO-SAVE BLENDED LEARNING MODEL

Coordinators: Intellect Foundation, University of Bologna

Type: Methodology, guidelines

Medium: On the web

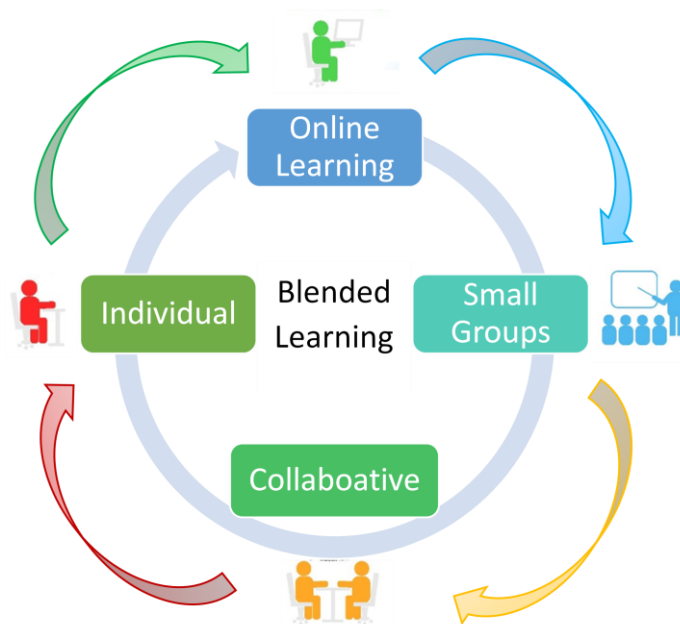
Languages: English, Bulgarian, Turkish, Greek, Italian


BIO-Save blended learning model aims at:

- Designing and setting up a **flexible innovative blended learning system** to be used by diverse higher education organisations and business stakeholders to provide an **interactive training environment**.
- Developing **competence-based** learning strategy grounded on the concept that different skills are required by different workforce segments in different economic sectors depending on different technologies used in them.
- Mediating the **shift** to modern technology for reading competences. The knowledge provision corresponds to Education 4.0 multi-dimensional approach for Industry 4.0 workforce needs satisfaction. This approach interrelates the skills needed by various economy and business dimensions with the educational offers in terms of anticipated competences to serve both individuals and institutions in their identification of skills' coverage for Industry 4.0 activities. The set of skills needed are classified as technological, contextual and transversal.
 - Offering this set of skills by a **combination of e-learning technology, assessment tests and offline materials**.
 - Bringing defined technological, contextual and transversal skills through:
 - Optimal online and offline learning approaches,

BIO-Save blended learning model is:

- Based on **analysis of the needs** for higher education training oriented to the BIO-Save target groups.
- Focused on **modern biotechnology approaches** for climate change adaptation.
- Drawing upon **expertise** of partners' organisations and other stakeholders and professionals to develop innovative solutions, products and processes.





BIO-Save blended learning model is implemented into the **b-Learning Guide in Modern Biotechnology for Higher Education Professionals** which has three parts:

- “***New learning and teaching methods in HE programmes***” offers analysis of the good practices and methods in teaching, learning and assessment, and how teaching, learning and assessment to be best organised to allow students to reach the intended Learning Outcomes.
- “***BIO-Save project learning***” describes the Learning Outcomes on the platform and defines how to use the online and offline benefits of the interactive environment.
- “***The use of ICT in HE***” gives short information on the use of ICT tools and applications in higher education to enhance professors’ and practitioners’ awareness and digital skills.

BIO-SAVE MODULAR EDUCATION PROGRAMME

Coordinators: Sofia University, Intellect Foundation

Type: Learning / training material, Guide

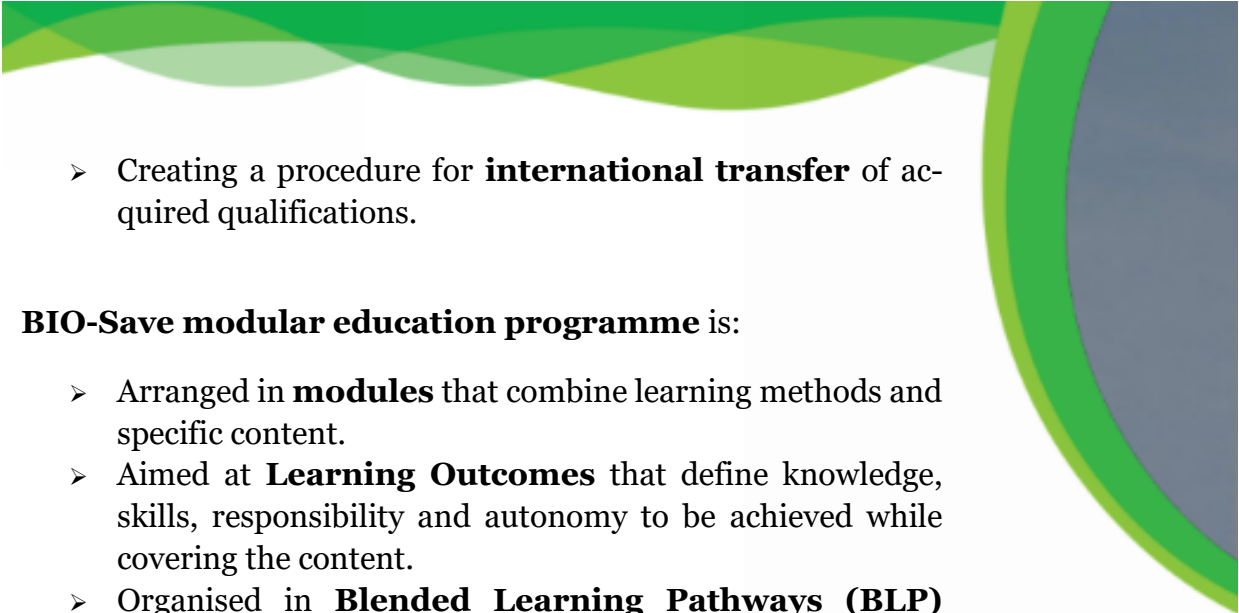
Medium: On the web

Languages: English, Bulgarian, Turkish, Greek, Italian



BIO-Save modular education programme aims at:

- Developing and delivering an **innovative modular academic programme** dedicated to modern biotechnology approaches for climate change mitigation.
- Meeting the needs for academic programmes in accordance with the **requirements** of the BIO-Save targets.
- Employing the recognised **European instruments EQF/HE/ECTS** and the concept of a common and **user-friendly ‘language’** for transparency, transfer and recognition of the Learning Outcomes.

- 
- Creating a procedure for **international transfer** of acquired qualifications.

BIO-Save modular education programme is:


- Arranged in **modules** that combine learning methods and specific content.
- Aimed at **Learning Outcomes** that define knowledge, skills, responsibility and autonomy to be achieved while covering the content.
- Organised in **Blended Learning Pathways (BLP)** aimed at different targets and EQF / NQF / HE levels (in each partner country, 3 relevant degrees of education are selected among EQF/NQF/HE levels 6, 7 and 8) and translated in English, Bulgarian, Turkish, Greek and Italian.
- Giving various e-learning opportunities: **offline and online, personalised paths, short intensive courses, skills training**, etc.

BIO-Save modular education programme has two outputs:

- The **BIO-Save Learning Curriculum** which:
 - Highlights the potential of modern technologies to increase productivity and to meet rapidly growing demand for energy, food, nutrition, and health,
 - Presents the impact of modern biotechnology approaches in climate change mitigation for improving quality of life, and
 - Is organised into two parts:

Part 1. Biotechnology for climate change mitigation

1.1. Reduction GHGS emission

- 
- 1.2. Use of energy efficient farming
 - 1.3. Carbon sequestration
 - 1.4. Reduced use of synthetic fertilizer
 - 1.5. Adaptation to abiotic stresses and evaluation of adaptation measures

Part 2. Biotechnologies for climate change adaptation in agriculture

2.1. Biotechnology approach to solve agricultural and natural resources problems and restore degraded ecosystems

2.2. Enhancing adaptive capacity of crops: Innovation in plant breeding to develop more resilient to climate change crop varieties for agriculture

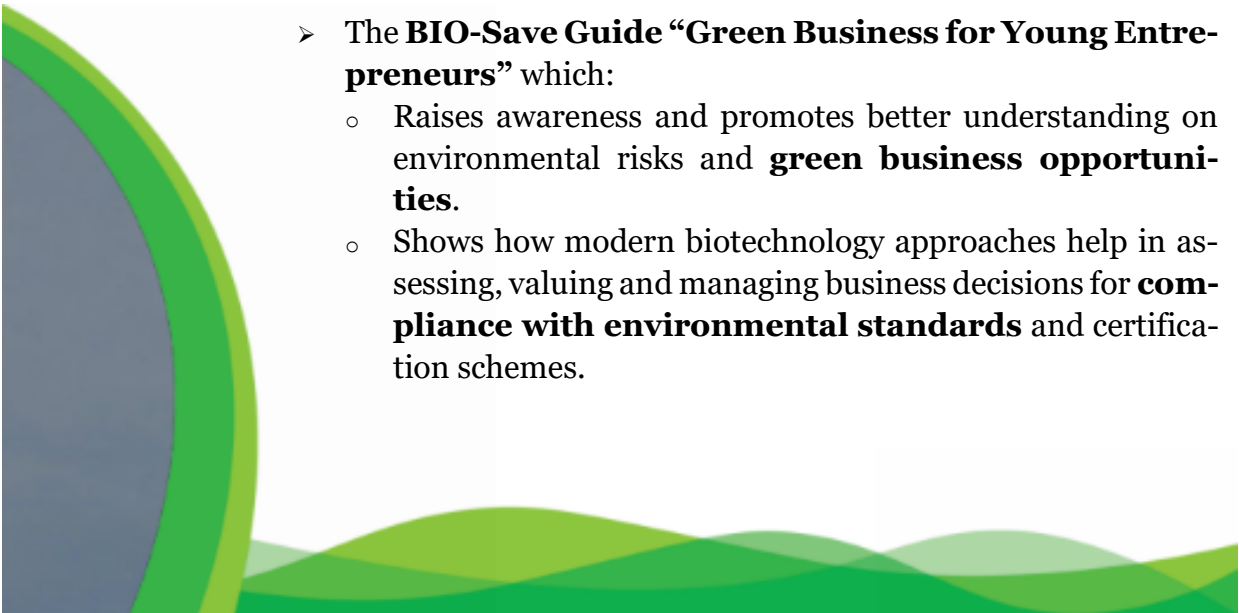
2.3. Agro-ecosystem responses to combination of elevated CO₂, ozone, salt and heat changes resulting from global climate change


2.4. Crop diversification and opportunity for climate change resilience

2.5. Use of new technologies and practices (e.g. soil and water conservation, pest and disease control)

2.6. Conservation and exchange of plant genetic resources

2.7. Addressing climate changes with ISO standards

- 
- **The BIO-Save Guide “Green Business for Young Entrepreneurs”** which:
 - Raises awareness and promotes better understanding on environmental risks and **green business opportunities**.
 - Shows how modern biotechnology approaches help in assessing, valuing and managing business decisions for **compliance with environmental standards** and certification schemes.

- 
- Supports **young entrepreneurs** and practitioners in the biotech sector in gaining innovative knowledge, skills and competences.
 - Supports the implementation of companies' green business management systems to adopt **cooperative sustainable strategies** for climate change mitigation.
 - Reaches a broader audience interested in **green business products** and their practical use.
 - Follows the testing of **eco-innovative business ideas**, consultations among the partners and stakeholders, and assessment of the capacity.
 - Is blueprinted as Learning Outcomes and Units.
 - ⊗ Offers content in English, Bulgarian, Greek, Turkish and Italian.
 - Organises different biotechnology subjects as Learning Outcomes.
 - Has two main parts:

Part I “Green products and bio-processes overview” which introduces new products and processes covering topics of:

Engineering sustainable food production

Using carbon dioxide as a raw material

Non-resource draining zero waste bio-processing


Part II “Green products development and business” discusses short case-studies on how the products are used by companies in different contexts and sectors.

BIO-SAVE CAREER GUIDANCE

Coordinators: Biognosis, University of Thessaly

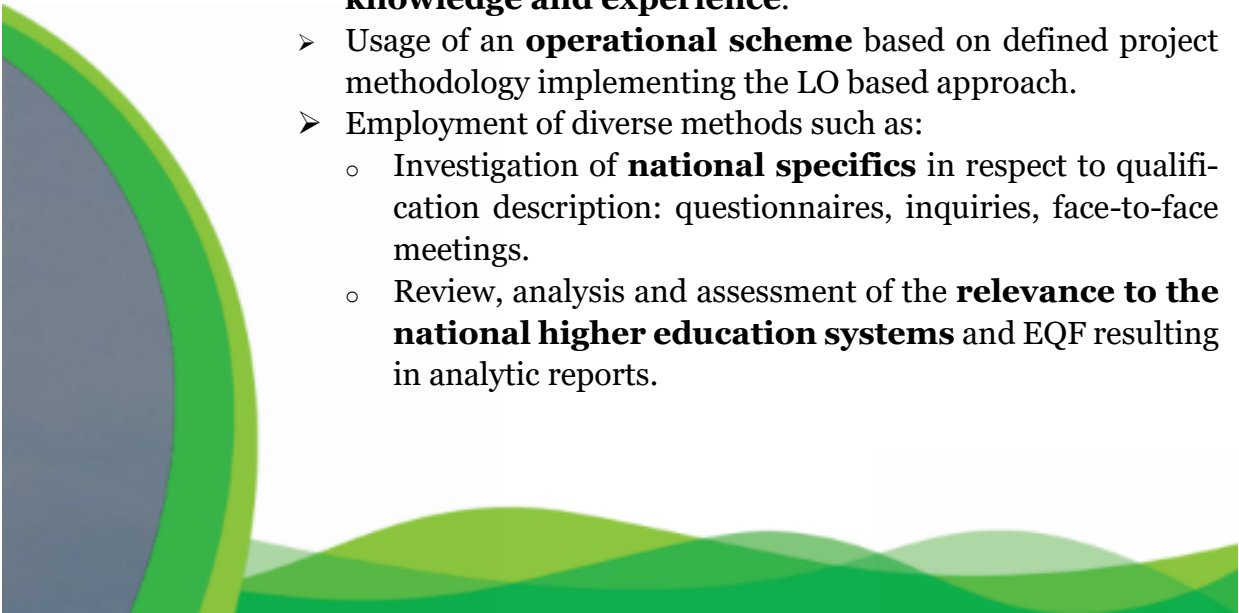
Type: Guideline

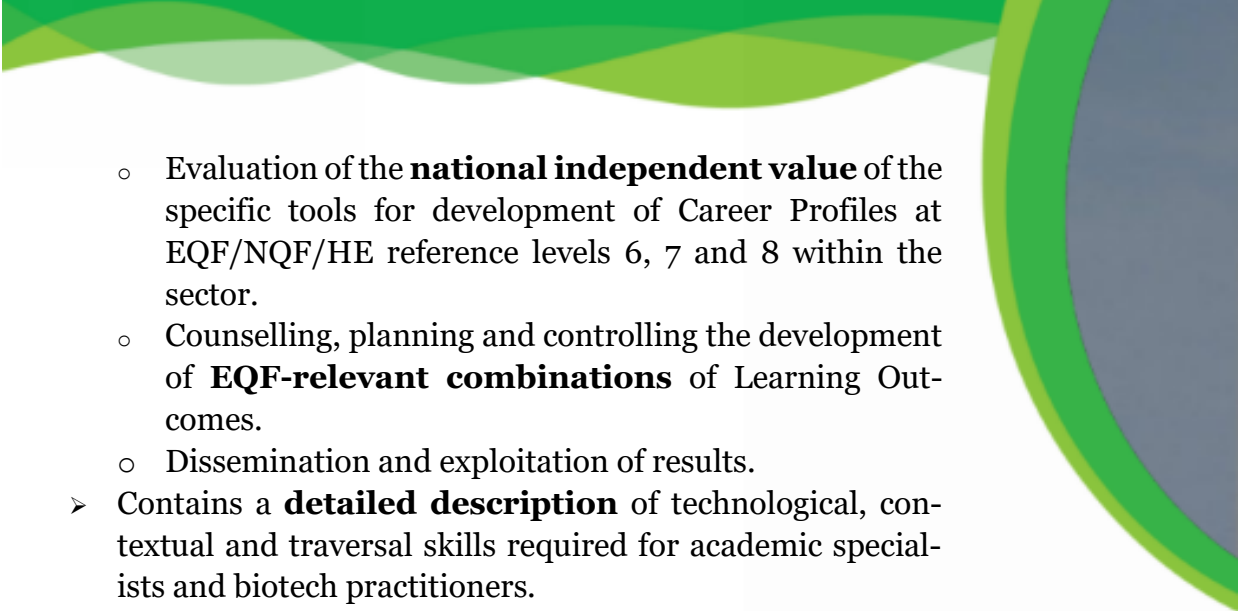
Medium: On the web



Languages: English, Bulgarian, Turkish, Greek, Italian

BIO-Save Career Guidance aims at:

- Defining at least 10 Career Profiles in modern biotechnology (at the national level) which:
 - Are designed for graduates at different NQF/EQF/HE reference levels (6, 7 and 8).
 - Mirror a detailed view of STEM knowledge and job specific and transversal skills required for academic professionals and biotech practitioners in the area.
 - Depend on a concise definition of wider competences (general wide-ranging skills for professionals).
 - Establishing common criteria and qualification standards for development of sample documents to **certify the university education**.
 - Providing a scheme for acquisition of competences and how to deliver **information on completed and current education** of an individual in the project area.
 - BIO-Save Career Guidance produces the **BIO-Save Competence Catalogue** that is a result of:
 - Tracking, accumulation and relations of the **trainee's knowledge and experience**.
 - Usage of an **operational scheme** based on defined project methodology implementing the LO based approach.
 - Employment of diverse methods such as:
 - Investigation of **national specifics** in respect to qualification description: questionnaires, inquiries, face-to-face meetings.
 - Review, analysis and assessment of the **relevance to the national higher education systems** and EQF resulting in analytic reports.
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- Evaluation of the **national independent value** of the specific tools for development of Career Profiles at EQF/NQF/HE reference levels 6, 7 and 8 within the sector.
 - Counselling, planning and controlling the development of **EQF-relevant combinations** of Learning Outcomes.
 - Dissemination and exploitation of results.
 - Contains a **detailed description** of technological, contextual and transversal skills required for academic specialists and biotech practitioners.
 - Describes qualifications on the **EQF/HE levels**, including particular skills and knowledge with respect to the safety, communication and attitude.
 - Acts as a useful tool for better **recognition of skills and competences** of graduates seeking jobs in the real business.
 - Gives the trainees tools for **easier transfer** from academic to business environment to support the national strategies for improving societal demands.
 - Is organised into two parts:


Part I: **Career profiles** are schemes for description of qualifications for specialists and professionals in the target area based on Learning Outcomes (LOs) with basic components of a qualification: technological, contextual and transversal skills. The key career profiles facilitate the cross-border recognition of sectoral qualifications in accordance with the EQF/HE/ESTS and policy requirements of the biotech sector.

Part II: **Competence records** include a selection of **model documents** that reflect the skills, applied knowledge, and attitudes related to the specific occupation following the established EQF/NQF/HE quality criteria, procedures and standards:

EUROPASS passport;

Digital Competence record;

Certificates from previous education and relevant profiles, outlining,



qualification and competence, self-directed learning activities, special training, publications, etc.

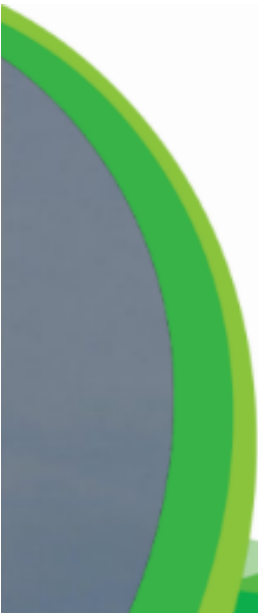
BIO-SAVE: THE TEAM OR TOGETHER EVERYONE ACHIEVES MORE

[Teamwork] is the fuel that allows common people to attain uncommon results.

Andrew Carnegie


The **diversity** in expertise, knowledge and skills and the long experience in **collaborative working** is among the definite benefits of our BIO-Save partnership. The responsibilities for the BIO-Save tasks and subtasks are also **fairly shared** among us and according to the specific capabilities of each partner organisation.

Sofia University St. Kliment Ohridski is the largest university in Bulgaria with 102 degree programmes offered by 16 faculties. It is also the national foremost centre for higher education and research in theoretical and applied areas, working on many initiatives within the global strive for science and education.



The education provided by the Sofia University meets the European standards and follows the best practice in the development, management and implementation of scientific achievements. The research covers almost all fields of natural and social sciences, among them biotechnology, agriculture and environmental technologies covering all major domains of modern biotechnology – industrial biotechnology, agricultural biotechnology, food and medical biotechnology. Researchers working at the Sofia University are among contractors, coordinators and participants in over 30 national and international research projects funded by the EU programmes,






the National Science Fund and private partnerships. Recognised experts in biotechnology and environmental sciences who are members of the teaching and research staff of the Sofia University, are members of research teams working on projects funded within the Horizon 2020, Environment, Natura 2000 and other research and innovation programmes.

Sofia University is the contractor of the BIO-Save initiative and the leader of the Project Management Board (PMB) responsible for the organisation and management of all financial matters and the distribution of tasks and funding.

The team is the leader of two work packages: WP2 ‘BIO-Save Management and Administration’ and WP5 ‘BIO-Save Modular Education Programme’. It monitors the project progress in each partner institution to assure the quality of the project outputs within an integrated framework of services and specific pathways for the development and proper implementation of the educational objectives and strategies. Sofia University organises the follow-up phase, dissemination and exploitation activities, popularisation of the BIO-Save objectives and goals, results and products, the networking, training activities and post-project measures.

Intellect Foundation is a non-profit organisation which unifies the efforts of professionals in education and research and development in biotechnology, environment protection, healthcare, and project management. It promotes the collaboration of different training settings in higher and continuous education through the use of Information and Communication technologies (ICT). The team consists of experienced educators and authors of textbooks, experts in quality assurance, curriculum development, new IT based training methods, with experience in introduction of the instruments of the European Qualification Framework and national qualification frameworks. They have dealt with production, application and economic planning in industrial and green biotechnology, esp. in sustainable environment, as well as in design and implementation of microbial fermentation processes for production of bioactive compounds. The Intellect Foundation has active contacts with biotech companies, environmental scientists, planners, hazardous waste technicians, engineers, etc.




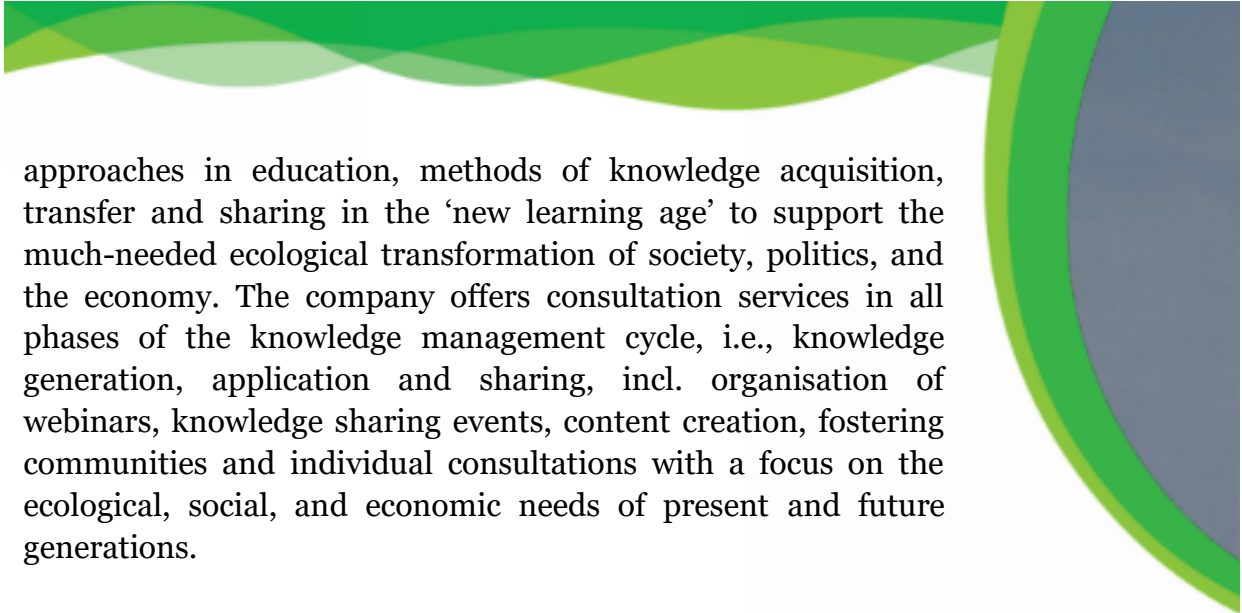
The Intellect Foundation organises the BIO-Save local activities and takes care for the progress of the tasks, elaboration of the products, and effective measures for ensuring effective dissemination and post-project life. The Foundation is the leader of WP4 'BIO-Save Blended Learning Model' and is responsible for the development of the BIO-Save b-Learning Guide in Modern Biotechnology for Higher Education Professionals. It is also engaged in the networking, dissemination and post-project life measures.

BULGAP Ltd. works in food and agro-industry to support biotech companies, agricultural producers and producer organisations in establishment and implementation of food safety standards (ISO 22000, FS 22000, IFS, BRC, GLOBAL G.A.P. and Codes for Good Agricultural Practices). It provides strategic solutions for development and implementation of management systems and standards and product certification offering services for accreditation of laboratories and inspection, CE marking, optimisation and redesign of business processes. BULGAP Ltd. has an in-depth experience in coordinating and participating in different initiatives funded by the European Union, including the ERASMUS+ programme (the company is the contractor of Bio-FIT 2015-1-BG01-KA202-014258 project). BULGAP Ltd. performs feasibility assessment on various operational programmes and deals with project documentation and project management. It offers training in international standards (including Good Agricultural Practices) by highly experienced professionals.

BULGAP Ltd. monitors the local progress on the tasks, administrative matters, financial management, elaboration of project products and their piloting. It is the leader of the WP7 'BIO-Save Quality Management and Monitoring' which aims at establishing a system of procedures, criteria and resources for quality management and monitoring of the project progress and integrity. BULGAP Ltd. is involved in the analysis of the feedback and subsequent corrective actions and in the dissemination, exploitation and popularisation measures, networking, organisation of the training activities and post-project measures.

EKO-Znanie GT Ltd. supports initiatives of research and innovation in the field of ecology and development of information products, teaching, mentoring and consulting services on the new






approaches in education, methods of knowledge acquisition, transfer and sharing in the ‘new learning age’ to support the much-needed ecological transformation of society, politics, and the economy. The company offers consultation services in all phases of the knowledge management cycle, i.e., knowledge generation, application and sharing, incl. organisation of webinars, knowledge sharing events, content creation, fostering communities and individual consultations with a focus on the ecological, social, and economic needs of present and future generations.

The staff members have experience in technology, administration and communication in research, advertising and marketing, integration of the novel forms of knowledge transfer and technologies to create new knowledge-based systems.

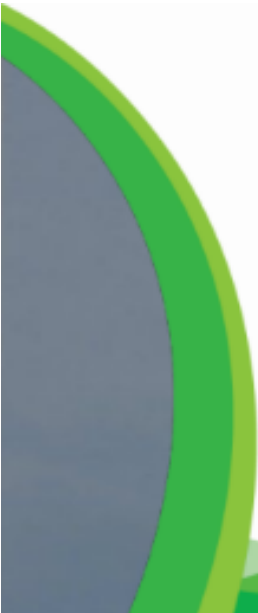
EKO-Znanie GT Ltd. enters the BIO-Save initiative with its expertise in managing projects at national and European level. It is responsible for the local management of the project specific activities and organisation of active post-project measures. It is the leader of WP8 ‘BIO-Save b-Learning Piloting/Testing and Feedback’, and an active participant in the dissemination, exploration and popularisation measures, networking, and support to the post-project life.

The University of Thessaly (UTH) was established in 1984, with an administrative and academic centre in Volos. The university has 18 departments and various research centres across the region of Thessaly with departments in Volos, Larissa, Trikala, Karditsa and Lamia. The University of Thessaly offers research and business undergraduate, graduate and postgraduate programmes and extra-curricular modules to over 12 000 students. The university is known for its excellence in research in accordance with the international standards. The members of the academic and research staff participate in numerous European research networks and innovative research projects. The Lifelong Learning Center (LLC) at the UTH helps the students to meet the requirements of the labour market and offers basic and individually tailored training and employment services in all the relevant areas.





UTH is the leader of WP9 ‘BIO-Save Dissemination & Exploitation Strategy’ and is responsible for the development and follow-up of the dissemination strategy among partners. It coordinates the local dissemination measures, participates in scientific events, and is responsible for the communication with the associated partners in Greece. The UTH has a plethora of initiatives to gain knowledge about the people’s daily lives, so it can assist self-directed learners that are independent and confident and willing to give back to society through leadership or civic duties. In working on the BIO-Save initiative, the UTH aims at gaining and sharing novel knowledge and changing paradigms to aid society in meeting the new challenges as they come along.

Biognosis is a not-for-profit organisation working in public health protection and management of natural resources and the environment. It is an active participant in initiatives in education and VET training through introducing new learning and teaching methods and approaches, with a focus on the up-scaling of the quality of education with novel forms of learning, open learning resources, flexible learning systems and better exploitation of the ICT. Biognosis has extensive experience in national and international programmes (Leonardo da Vinci, Erasmus+, Horizon 2020) which offer integrated solutions to an increasingly demanding environment. Biognosis provides a comprehensive service for developing and embedding flexible modes of teaching and learning and innovative best practices and multidisciplinary thinking.



Biognosis offers the BIO-Save partnership expertise in environmental protection and development of open research and educational resources. It is the leader of WP6 ‘BIO-Save Career Guidance’, and together with Sofia University and Gazi University it is responsible for the organisation of workshops and meetings with project targets and preparation of dissemination materials. It coordinates the dissemination and is responsible for the communication with the associated partners in Greece. It assists in transferring the project’s technological results and research innovations to both public and private research centers within the valorisation activities and pilot testing at regional, national and international level.






Since 1088, **Alma Mater Studiorum – Università di Bologna (UNIBO)** has been a home for a plethora of students, scientists and artists. Across its five campuses in the Emilia Romagna region and a branch in Buenos Aires, UNIBO offers over 200 degree programmes among its 32 departments to over 81,000 students. 5,000 graduates are enrolled in PhDs and 3rd cycle programmes. The researchers participating in the BIO-Save belong to the large Department of Agricultural and Food Sciences (DISTAL) whose research covers topics spanning from primary and food production, and sustainable plant defence to environment protection.

DISTAL has advanced expertise in environmental protection and sustainable strategies for environment preservation and clean-up. DISTAL integrates biotechnological methods with mitigation approaches with a continuous focus on sustainability. UNIBO and DISTAL aim at filling the gaps between the modern biotechnology education and the labour market in the biotech sector, and covering the lack of entrepreneurial and strategic planning skills in modern biotechnology.

DISTAL is the co-leader of WP4 ‘BIO-Save Blended Learning Model’ and coordinates the design and set-up of the BIO-Save Blended Learning System. It is responsible for the dissemination, organisation of events and communication with the associated partners in Italy. The UNIBO also aims at defining the teaching programme by collecting novel integrated strategies for climate change mitigation. It has extensive contacts in the industry which are exploited for designing a practical approach in the integration of academia and industry.

Institute of Information Technology Ltd. (Initut) provides integrated ICT solutions with an additional focus on research within three pillars: consulting, development and integration of specific customised internationalised IT solutions for profit and non-profit organisations and projects; related research in information technologies, education and teaching, e-learning and e-materials, visualisation, simulation and animation, blended learning systems, knowledge management and integration, geographical information systems, combinatorics, waste management, liquid crystals, plagiarism, IT support for VET etc.




It provides education and training services to companies and project-oriented organisations and associations in the public and the private sector. The staff members have over 20 years of experience in trends in personal research, occupational related research, and the EU and national projects.

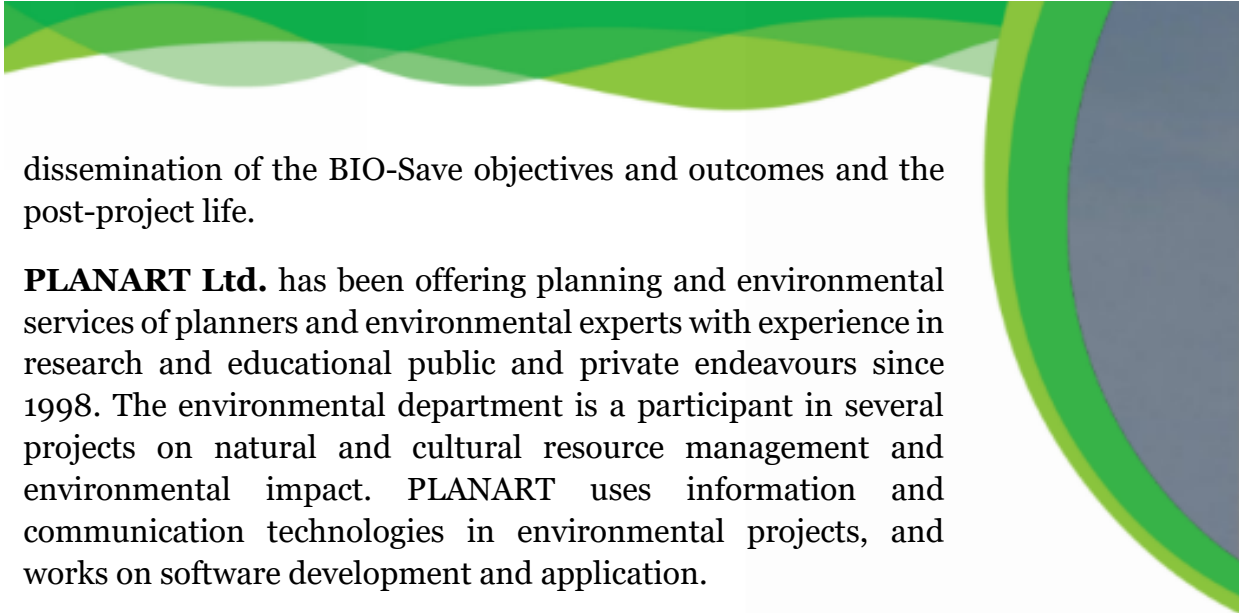
Initut is the leader of the WP3 ‘BIO-Save Cloud-based Web Portal’. Initut relies on its experience in project management, training and business consulting and supporting learning platforms and preparation of learning materials to ensure a functioning cloud-based web portal and learning platform with materials on modern biotechnology and biotech business. Initut is responsible for the organisation and performance of dissemination and scientific events, pilot and training activities, as well as for the dissemination, exploitation and popularisation measures and networking in Slovenia.

Gazi University (GU), with its 21 faculties, 16 vocational colleges, 48 research centres, a state conservatory and 7 institutes, ranks among the best 500 universities of the world, with more than 78,000 students and over 4,000 educational and research staff in many campuses across the region of Ankara. Gazi University is an active participant in FP7 and Erasmus+ programmes and in 180 bilateral international collaboration and dual-degree programmes. The University has a vast experience in LLP LdV with the highest support received among Turkish universities. The participant in the BIO-Save project is the Environmental Sciences Department of the Graduate School of Natural and Applied Sciences, Sea and Aquatic Sciences

Application and Research Centre (DENAM) which conducts research in healthcare, marine and environmental sciences, climate change, ecotoxicology and ecology.

Gazi University is the leader of WP1 ‘BIO-Save Conceptual Design and Commencement’ and is responsible for gathering and summarising data from the background analysis at national level. The Gazi University takes part in the BIO-Save qualification descriptions, and the elaboration of the BIO-Save Competence Catalogue. Gazi University has extensive contacts in biotechnology and other industries to support the canvassing activities of the BIO-Save project and to ensure the effective





dissemination of the BIO-Save objectives and outcomes and the post-project life.

PLANART Ltd. has been offering planning and environmental services of planners and environmental experts with experience in research and educational public and private endeavours since 1998. The environmental department is a participant in several projects on natural and cultural resource management and environmental impact. PLANART uses information and communication technologies in environmental projects, and works on software development and application.


PLANART provides various services, incl. reports and studies on design, construction and management consultancy.

PLANART supports an active partner network with Turkish and European institutions. It is the co-leader of WP9 ‘BIO-Save Dissemination & Exploitation Strategy’ with the task to support the effective dissemination and exploitation strategy at national and international level. It is responsible for the selection of good practices for dissemination and collection of feedback on the BIO-Save results, organisation of evaluation events and workshops for the exploitation of the project outcomes.

BIO-SAVE: PROJECT MANAGEMENT

The BIO-Save project is administered through the **System Development Life Cycle (SDLC) method** where:

- The project life period is guided through **time boxing methodology**.
- The **project plan** defines the goals and objectives, and how they are achieved.
- **Tasks** are identified with **allocation of the resources** needed.
- **Budget** and **timeline** for completion are rightly defined.



Project Management Board (PMB) consists of representatives of partners' institutions led by the Project Coordinator and:

- Takes care of identifying the project needs and achieving the objectives.
- Elaborates the strategy for development of innovative blended training in modern biotechnology and controls its implementation.
- Monitors the performance of other project activities and the implementation of dissemination and exploitation measures, and quality management and evaluation at different stages.

The Project Scientific Committee (PSC) consists of experts from each National Executive Bureaus (NEBs), headed by the project manager, and monitors:

- Activities regarding the development of the innovative b-learning programme, its subject-specific content and mode of delivery.
- Organisation and day-to-day management of the project work at partners' level by National Executive Bureaus (NEBs).

National Executive Bureaus (NEBs):

- Comprise representatives of partners' organisations and local experts experienced in project management.
- Ensure detailed coordination, execution, monitoring and reporting of the work packages and technical support of the project daily tasks.

BIO-SAVE: INVEST IN THE FUTURE

An investment in knowledge pays the best interest.

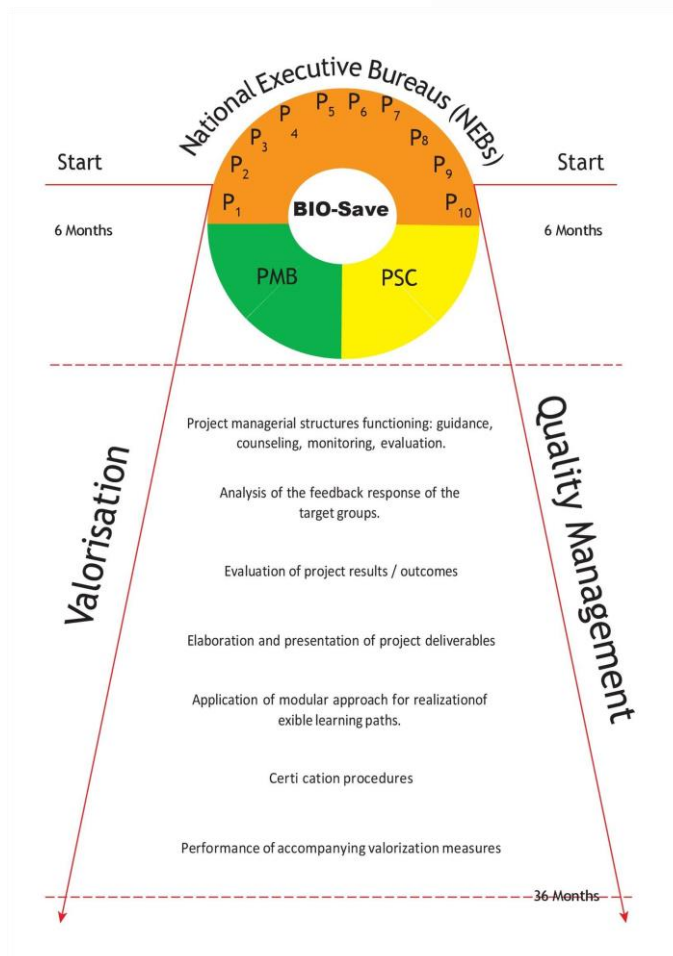
Benjamin Franklin


BIO-SAVE: SUSTAINABILITY

A sustainable impact of the BIO-Save learning model and results is expected due to:

- The **flexibility** and **modularisation** of the BIO-Save learning content and the **diversity** of the BIO-Save educational solutions.
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- The versatility of the BIO-Save **e-learning** materials and **blended learning** methodology that can be promoted among external academic and business organisations.
- The structure of the BIO-Save results which **allows self-training** for learners (via participating in working groups and online events, searching for information and documents according to their needs and availability at a particular time).
- The structure of the learning modules and Learning Pathways that allows them to be **reproduced on demand**.



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- The cloud-based BIO-Save content that is monitored in the mode of “**return on investment**” cycle by continuous assessment of technological, contextual and traversal skills levels optimised for **increased competitiveness**.
 - The elaboration of a “**knowledge strategy**” for higher education and business stakeholders based on the BIO-Save competence-based model.
 - The exploitation of the BIO-Save Competence Catalogue to enable the end-users to **transform** their specific learning and help them **remain competitive**.



BIO-SAVE: THE IMPACT

Impact at regional / national level

In short term, the BIO-Save interactive educational platform aims to:

- Increase the users’ chance for training.
- Encourage the sustainability of the project results.
- Stimulate the national and regional economy.
- Enlarge the framework of business-related training based on ECTS/EQF/HE, Learning Outcomes and their integration in the national and regional academic bodies.
- Provide preferences for the use of new multidiscipline study programmes.
- Implement the definitions of new professional technological, contextual and traversal skills.

In the long term, the BIO-Save project:

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- Supports the promotion of the organisation's capacity to network with HE institutions at national level.
 - Improves the training opportunities for the SMEs.
 - Increases the awareness for higher education in industrial companies, organisations and groups.
 - Urges the stakeholders to seek funding for educational purposes in order to raise SMEs’ interest in biotech.
 - Promoting digital technologies in education to transform the delivery of education and the role of the direct programme users in individualized learning environments.
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Impact at European level

In short term, the BIO-Save project aims to:


- Develop effective tools for open and innovative higher education through the use of ICT in agreement with the EU Agenda.
- Highlight the quality of the education.
- Organise diverse initiatives (seminars, evaluation events, workshops, etc.).


In the long term, the BIO-Save educational outputs:

- Influence the training capacity within the European Union.
- Support the partners' ability to transfer technological information to the biotech SMEs in the European Union.
- Improve the connection between higher education institutions in order to set the ECTS system and EQF.
- Assist in keeping the pace of the European knowledge-based economy and promoting the recognition of the reform in the *European Higher Education Area* at national and European level.
- Promote the development of competency profile that will help the educational organizations and administrative authorities for assembling training programmes.
- Encourage the use of this competency profile as guidelines for the 'trainers of academics/practitioners' to assist them in gaining expertise to efficiently educate future tutors/trainers and making them up-to-date of emerging technologies tackling artificial intelligence, robotics, and Internet of Things.

Impact on International level

In short term, BIO-Save aims to:

- Unify the background, knowledge and innovative trends in the *European Higher Education Area* policy.
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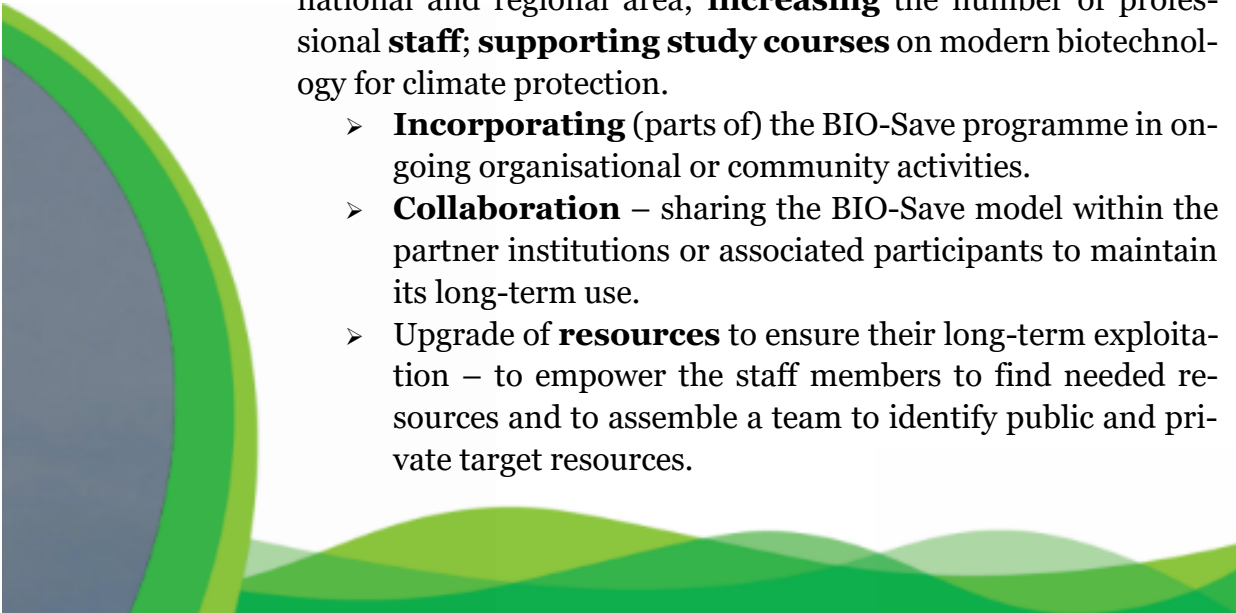
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- Guarantee the probated mechanisms for creation of qualification framework through: use of tools for validation and recognition of the BIO-Save learning; application of the ECTS system in higher education; introduction of EUROPASS documents that record an individual's qualifications, credits and learning outcomes.

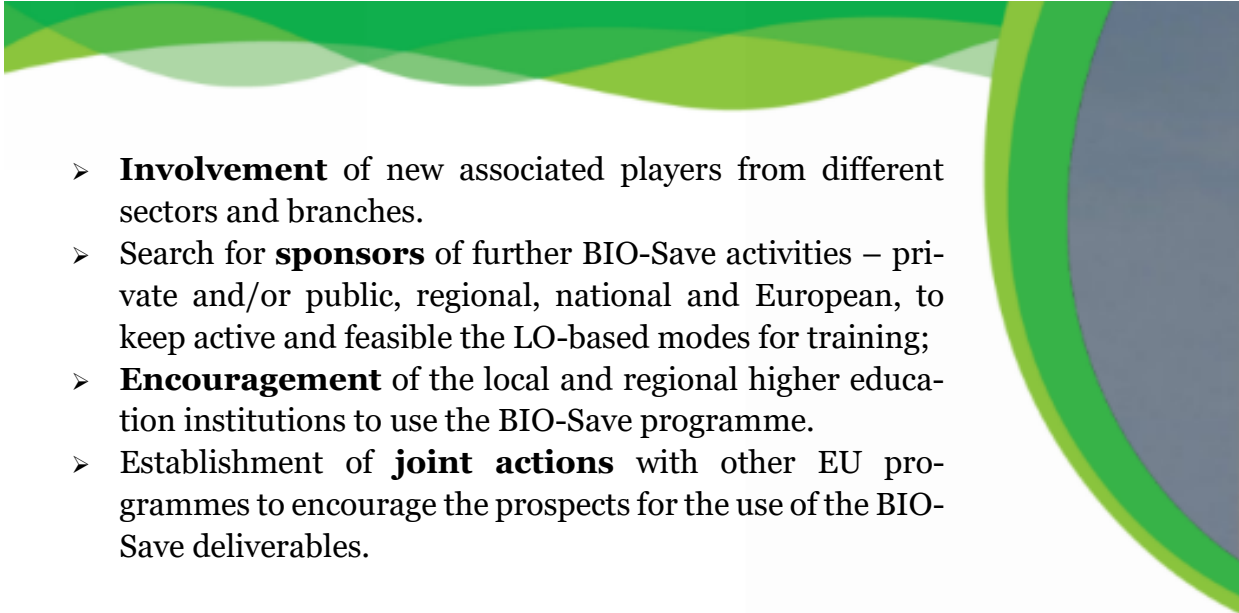
In the long term, BIO-Save project introduces:

- Instruments intended to boost the ongoing trans-European process for smooth transition from education to business and/or progression to further education.
- Up-to-date ICT based modes of training in higher education to assist the career of the biotech professionals and the upgrade of their competence at international scale.
- Networking to widely spread the *European Higher Education Area* initiatives and procedures in the non-EU countries.

BIO-SAVE: POST-PROJECT LIFE

After the end of the project, the BIO-Save Consortium plans various measures to maintain the BIO-Save project programme through:

- **Building capacity** to foster project accessibility including: developing **new learning activities** to meet the students and industry demands in project national and regional area; **increasing** the number of professional **staff**; **supporting study courses** on modern biotechnology for climate protection.
 - **Incorporating** (parts of) the BIO-Save programme in ongoing organisational or community activities.
 - **Collaboration** – sharing the BIO-Save model within the partner institutions or associated participants to maintain its long-term use.
 - Upgrade of **resources** to ensure their long-term exploitation – to empower the staff members to find needed resources and to assemble a team to identify public and private target resources.
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- **Involvement** of new associated players from different sectors and branches.
 - Search for **sponsors** of further BIO-Save activities – private and/or public, regional, national and European, to keep active and feasible the LO-based modes for training;
 - **Encouragement** of the local and regional higher education institutions to use the BIO-Save programme.
 - Establishment of **joint actions** with other EU programmes to encourage the prospects for the use of the BIO-Save deliverables.

AND SPECIFICALLY:

The BIO-Save e-platform will operate after the end of the project – to bring innovations, news and educational and career information; to offer training materials and opportunities to beneficiaries looking for specialised training in biotech approaches for climate mitigation.

Dissemination and exploitation activities will continue with ongoing presentation and distribution of information and materials about the BIO-Save learning model and outcomes.

The Units of Learning Outcomes and modules will be introduced into the formal programmes of the educational organisations that participate in the project.

The BIO-Save programme will be supported by the management of the higher educational institutions by offering educational paths on demand to business practitioners through competence-based blended modes of learning.



<https://bio-save.eu/>

*Issued by: Sofia University "St. Kliment Ohridski", BG
Intellect Foundation, BG*