R8: BIO-Save Programme Value

Guideline

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

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

The aim

INTRODUCTION

- ***Tackling the*** *pressing sustainability needs of society* will require developing and applying new technologies. Biotechnology, encouraged by recent advances in omics technologies and synthetic biology, offers to generate sustainable biologically-based routes to chemicals and materials as alternatives to fossil-derived incumbents.
- Yet, the sustainability potential of biotechnology is not without trade-offs. Nowadays, the biotechnologies advances create opportunities for *developing* ***novel environmentally friendly processes and materials*** produced with significantly fewer carbon emissions. The "green" progress in biological sciences is unthinkable without ***applying digital technologies*****.** The confluence of biotechnology and ICT is forcing the R&D process, thus meeting productivity challenges and enhancing sustainability and employability in the biotech sector.

The aim

INTRODUCTION

- One of the substantial goals of the BIO-Save Project is to ensure ***the sustainability of the programme results*** during and in post-project life so that they will remain further available and better used by the target users.
- The BIO-Save Partnership elaborates on Result 8 "BIO-Save Programme Value", that represents ***a guideline aiming to describe the BIO-Save Project results` final impact in terms of sustainability provision*** due to the activities undertaken in the project.

BIO-Save Programme Value Structure

TABLE OF CONTENTS OF THE GUIDELINE

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1. BIO-Save Project Overview

1.1 Brief description of the project goal, mission and vision

The *demand for well-educated and upskilled personnel in Modern biotechnologies* that will contribute to *implementing biotech approaches for climate change mitigation and innovation in the agriculture* and biotech sector is clearly outlined. HEI must respond to the changing skills demands by updating existing education programmes and qualifications and developing new ones.

The BIO-Save Project`s mission is to:

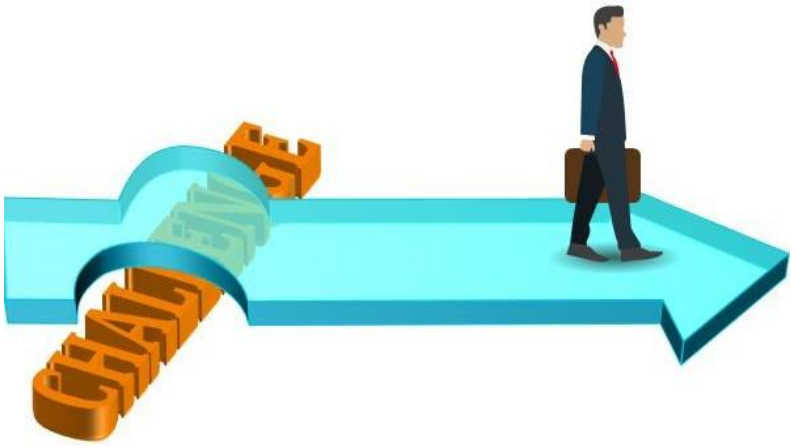
- Filling the gap between teaching in HE and continuous professional development in the biotech sector respecting climate change to promote best practices for its mitigation based on modern biotechnological approaches;
- Upgrading HE learning programmes benefits students, professors, and practitioners by linking them with the real-world job market and extending their entrepreneurial and digital skills.

1.2 Project challenges faced

- The project ***BIO-Save provides a solution for upgrading HE in Modern biotechnology by developing an innovative LO-based curriculum*** in "Modern biotechnology approaches for climate change mitigation" for EQF/HE qualification levels 6, 7, and 8 and supported with ECTS for LO Units` evaluation.
- Realizing this educational policy, the ***BIO-save expands the professional performance and opportunities of target groups*** and contributes to the relevant quality standards in the biotech area implementation.
- ***BIO-Save*** addresses ***challenges linked to climate change*** and promotion of education in modern biotechnology to facilitate the circular economy and sustain employment in the biotech sector.

1.2 Project challenges faced

- The existing and emerging ***knowledge and skills needed in the biotech sector for climate change prevention*** define these challenges. Embedding the BIO-Save education in real-life cases further promoted the subject among interested sectorial parties. This approach impacts the HEI and the farming organizations/agriculture and enhances the quality of life.



1.3 Work performed – project achievements in terms of its objectives and outcomes

- Design of blended learning programme in Modern biotechnology for climate change mitigation;
- Creation of an innovative blended learning model mediating the shift to the Education 4.0;
- Creation of an innovative model for qualifications description of learners in modern biotechnology;
- Design of flexible multilingual cloud-based programme: modules and SICs, LOs and Units, 3D imaging technology for training;
- Establishment of the education programme specific outcomes using EQF/NQF/HE and ECTS principles;
- Design of ECTS-based integrated prospects for mobility to the EU labor market of biotech professionals.

1.4 BIO-Save Essential Project Results

- The lack of knowledge in advanced climate-saving biotechnologies and the need for skilled professionals in the area restricted the biotech business and green economy.
- The BIO-Save project elaborates nine programme results, enabling the knowledge exchange between HE and biotech businesses, and are best suited to unlock the target users` potential.

R1: Study and report on skills gap demands biotech expertise in climate change mitigation

R2: Plan for educational programme implementation and operation

R3: BIO-Save b-learning platform (www.bio-save.eu)

R4: B-learning guide on modern biotechnology for higher education professionals

R5: BIO-Save learning curriculum

1.4 BIO-Save Essential Project Results

R6: BIO-Save guide Green biobusiness for young entrepreneurs

R7: BIO-Save competence catalogue

R8: BIO-Save programme value

R9: Training skills exchanging – smart dissemination toolkit

2. BIO-Save Project Results Impact

The BIO-Save project results` final impact (benefits) span several main areas, including ***environmental, social, and economic***. This impact includes improvements in ***HE in modern biotechnologies, environment health, quality of life, changes in the biotech industry, cost-savings to the economy or industry, generation of a higher quality workforce, job creation, better inter-personal relationships and collaborations, beneficial transfer and use of knowledge.***

2. BIO-Save Project Results Impact

The sustainability of the BIO-Save project is provided through:

2.1 The BIO-Save consortium elaborated an ***innovative EQF/HE-based b-learning approach*** for professionals in modern biotechnology. It enhances the users` chance for more skills and education in the project-subject field.

2.2 The developed ***BIO-Save cloud-based 3D learning platform*** enhances the users` chance to acquire new biotechnological and digital skills for further career development. It promotes the project results, which allows their sustaining after the end of the project.

2.3. ***BIO-Save b-learning programme in modern biotechnology*** is designed as LO-based BLPs by the ESCO system for qualification description. Thus, the BIO-Save project integrates sustainable development of biotechnology and digital technologies into HE programmes and, in such a way, addresses the new European economic demands for sustainable living.

2. BIO-Save Project Results Impact

2.4 The predefined ***target groups*** (B.Sc./M.Sc./Ph.D. students, professors, practitioners, biotech SME personnel) contributed to achieving project`s results sustainability since they use, evaluate, and disseminate them.

2.5 BIO-Save partners promoted the project`s results by ***disseminating and presenting*** them to various workshops, conferences, and other public events nationally and internationally. The consortium needs to disseminate and exploit the project results beyond its completion. The long-term delivery of the BIO-Save deliverables through the post-project phase is ensured by widening the partnership through the involvement of associate partners on a sectoral/cross-sectoral basis.

3. BIO-Save Project Results Evaluation

The BIO-Save project results are developed in response to the mismatch in the partners` countries between what higher education in modern biotechnology offers and the knowledge and skills for climate change mitigation required in the biotech industry.

The evaluation process can be an effective tool for the ***long-term sustainability of the BIO-Save results***.

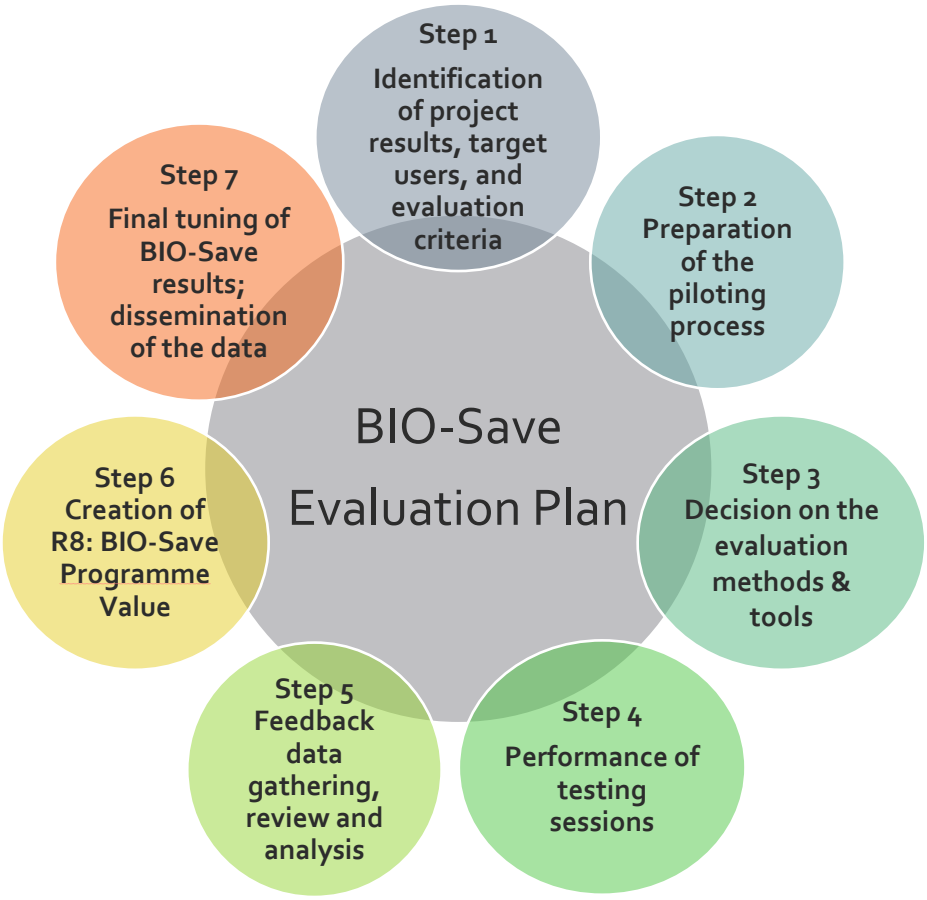
The evaluation feedback data will help the BIO-Save Consortium to:

- ✓ Better understanding how the different target users perceive and experience the project`s results
- ✓ Think of ways to improve the next piloting/evaluating event
- ✓ Focus on what is working and what is not
- ✓ Share their findings and conclusions for results modification and final revision.

3. BIO-Save Project Results Evaluation

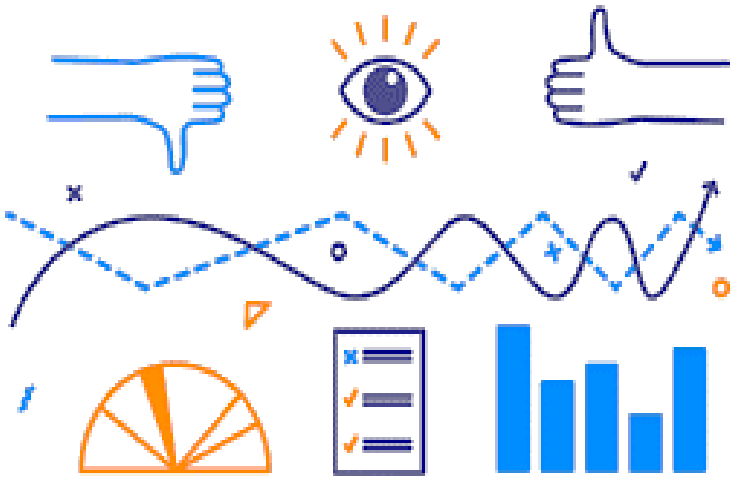
The evaluation research was performed in each partner`s country (BG, GR, IT, SI, TR) to provide feedback on the overall BIO-Save project results` specific content, applicability and acceptance.

The following research evaluation plan was applied:



3. BIO-Save Project Results Evaluation

- The evaluation is ***based on the data collected from the Piloting / Testing events*** performed in each partner`s country.
- BIO-Save project`s results` durable effect on the target users is ***studied by gathering personal opinions on their content, applicability and acceptance***



3. BIO-Save Project Results Evaluation

- To realize the process of data gathering, BIO-Save Consortium undertook the following activities:
  - The Consortium participated in ***different scientific, educational, and social events*** to disseminate the information for the BIO-Save project and to popularize the BIO-Save web portal and the supported project results.
  - The partnership ***collaborated with numerous students and academic professionals, biotech and*** agricultural ***practitioners, representatives of R&D and SMEs*** that raise interest in the project-subject area regarding the existing sustainable agricultural practices and the role of innovative BIO-Save education programme for their improvement.
  - ***Organization and performance of workshops*** and piloting /testing sessions in each partner`s country for results` presentation, evaluation and validation

3. BIO-Save Project Results Evaluation

3.1 Pre-piloting analysis of the project target users' professional experience, competencies, and skills.

The group of target users included 300 - 400 persons in total and encompassed representatives of HEIs, biotech SMEs, R & D centres and institutes, business representatives from agro-companies, and mass media representatives.

Participation in events:

- 26th UN Climate Change Conference (COP26), 2021
- Kliment's Days Conference, November 2022, Sofia, Bulgaria
- AISSA Conference, Conferenza delle Società Scientifiche Agrarie, Bologna, 2022

3. BIO-Save Project Results Evaluation

Target Users Profile	Professional area/occupation
Profile 1	B.Sc./M.Sc./Ph.D. students – Biotechnology, Microbiology, Agrobiotechnology
Profile 2	Academic professionals at HEIs – Agriculture, Biotechnology, Microbiology, Ecology, ICT,
Profile 3	SMEs in Biotech research and manufacturing
Profile 4	R&D centers – Biotechnology, Microbiology, Agriculture, Plant biotechnology, Ecology
Profile 5	Mass media
Profile 6	Social partners
Profile 7	IT professionals

3.2 ***Piloting the BIO-Save HE curriculum and cloud-based b-learning*** environments to different target groups.

The piloting was realized through:

- Elaboration and use of inquiries, questionnaires and advertising materials

3. BIO-Save Project Results Evaluation

- Organization and performance of Workshops:
  - ✓ "The BIO-SAVE approach in response to climate change", Alma Mater Studiorum – Università di Bologna, Dipartimento di Scienze e Tecnologie Agro-alimentari, 25 May 2023
  - ✓ "Cutting Edge Research of Ecology", International Seminar of Ecology-2023, 28 – 29 September, 2023, Sofia, Bulgaria"
  - ✓ "Education is a Key to Addressing Climate Change", 25 October 2023, Ankara, Türkiye
  - ✓ "Climate Change Education for Sustainable Future", 26 October 2023, Volos, Greece
- Organization and performance of testing sessions: 5 testing sessions were organized and performed in each partner`s country by preliminary prepared project instructions. The target users (around 150) tested the LO`s knowledge content and IT-based tools for training, using the BIO-Save cloud-based web platform as a broad multilingual tool for HE in

3. BIO-Save Project Results Evaluation

Project Results Evaluation

3.3 Feedback Data Collection, processing and analysis

3.3.1 Post-training ***analysis of the participants' feedback*** on the BIO-Save b-learning programme — its content`s vision, applicability and format, the interactive learning environment, availability of additional guiding materials, and general satisfaction.

3.3.2 Post-training ***analysis of learning***. This part covers a self-assessment of knowledge or skills gained and the participants' expected learning opportunities tailored to their needs.

Different dissemination and use tools were used/distributed among the participants:

- ✓ BIO-Save cloud-based web portal: **https://bio-save.eu/**
- ✓ PowerPoint presentations (EN, BG, GR, IT, TR)
- ✓ BIO-Save brochures and newsletters (EN, BG, GR, IT, TR)
- ✓ Feedback data gathering materials - questionnaires, reply cards (BG, EN, IT, GR, TR)

4. Final conclusions

3.4 Results` final revision and tuning of LO-based knowledge content.

This part summarizes the information from the accumulated feedback responses. It outlines the national peculiarities and the capacity of the project`s b-learning model in each partner`s country. This part also presents an evaluation of the future applicability of the BIO-Save educational programme, its effect over time, and the possibility of affecting the targets` career development through BIO-Save-specific skills adoption.

4. Final conclusions

The BIO-Save project partnership summarized the ***key findings from the evaluation of the results,*** launched the ***lessons learned,*** established the ***best practices,*** and determined the ***areas for improvement*** to achieve ***sustainability of the programme results***.

Applying the strategic management technique – SWOT analysis, the potential Strengths, Weaknesses, Opportunities and Threats are identified and presented.

4. Final conclusions

Strengths:

- ✓ Learning approach based on EQF/NQF/HE tools;
- ✓ Cloud-based learning platform integrating digital technologies;
- ✓ Training content in Modern Biotechnology for Climate Change Mitigation;
- ✓ Recognition of green & digital skills for learners & workers in Modern Bio-technology;
- ✓ Innovative model for qualifications description;
- ✓ Programme results, enabling the knowledge exchange between HE and biotech businesses.

Weaknesses:

- ✓ Lack of enough funds after project expiration to support the ECTS-integrated prospects for the mobility of working biotech power;
- ✓ Lack of sufficient flexibility in the administrative management of the current higher education system, which could hinder the process of official recognition of the educational opportunities created by the project.

4. Final conclusions

Opportunities:

- ✓ Upgrading HE in Modern bio-technology by developing an innovative LO-based curriculum;
- ✓ Assurance of project sustainability through dissemination and exploitation actions;
- ✓ Expanding the professional performance and opportunities of the target groups;
- ✓ Project results impacting several areas, including environmental, social, and economic ones;
- ✓ Enhanced users` chance to acquire new biotechnological and digital skills for further career development.

Threats:

- ✓ External events or factors (risks) beyond the project consortium control (e.g., *force majeure* circumstances) that can affect the project results impact negatively.

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