

D6.2. Website



**PHYtomanagement as a sustainable feedstock
source of lignocellulosic-based high-value Bio-based
products for textile applications**

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EXECUTIVE SUMMARY

This deliverable provides a comprehensive overview of the pHYBi project website, which has been available at www.pHYBi.eu since January 2025. The document outlines the structure and content of the website, detailing its various pages and sections. It describes the main features, including the home page, project information, case studies, partners section, news and events, resources and the pHYBi wiki. The website serves as a central hub for stakeholders, providing easy access to project updates, publications, deliverables and collaboration opportunities, and is therefore an important channel for the communication and dissemination activities of pHYBi. The layout and content are designed to ensure user-friendly navigation and facilitate knowledge sharing between project partners, researchers and the public.

1. INTRODUCTION

1.1 DESCRIPTION OF THE DOCUMENT AND PURSUE

The aim of D6.2 - Website is to describe the project website created for the pHYBi project. The website serves as one of the main communication tools and is often the first point of contact for people interested in the project. It provides a user-friendly platform with detailed information about the project's objectives, activities and results, making it accessible to a wide audience. Developed by a graphic design agency in collaboration with SEZ, the website has been available since January 2025 at the address: www.pHYBi.eu. The website serves all stakeholders by providing information on relevant events, promoting networking opportunities, providing key project updates and showcasing its results and achievements (e.g. publications). SEZ is responsible for continuously updating the website with the latest project news and results. New articles highlighting project milestones, showcasing partners' work and research, and reporting on events and workshops will be uploaded regularly. Even after the project has finished, the website will remain accessible for at least two years to ensure the dissemination of the project results.

The website is structured into 6 pages:

- **Project Homepage** – General overview of the project
- **About** – Background, Objectives, Concept and Impact of the project; Information on Case Studies.
- **Partners** – Brief descriptions of the project partners, their roles, and contributions, alongside contact details and links to collaborations and related projects.
- **pHYBi-Wiki** – Explanations of project-related topics such as phytoremediation, monitoring, and product applications.
- **News and events** – News around the project, updates on the project's progress, reports on workshops and events.
- **Ressources** – Public deliverables, publications and communication materials
- **Contact** - Information for reaching out to the project team.

1.2 WPS AND TASKS RELATED WITH THE DELIVERABLE

This deliverable refers to Task 6.1, 6.2, 6.3 and 6.3 included in WP6: Communication, dissemination and exploitation. The website serves as a key communication and dissemination tool, as outlined in the project's communication and dissemination plan (D6.1) and will support the main objectives of WP6:

- I. To raise awareness, ensuring project visibility via effective communication actions.
- II. To engage with key stakeholders, creating the conditions for effective mobilization and engagement of end users.
- III. To foster an effective outreach of the project results and findings across Europe through the development of a large community around the project objectives, maximizing the impact of the project work and outcomes.
- IV. To influence decision makers by sharing and transferring relevant conclusions derived from the activities and project outcomes.

2. NAVIGATION BAR

The navigation bar of the pHYBi project website provides easy access to the main sections of the site. Prominently displayed at the top of each page, the navigation bar contains the pHYBi project logo and links to the Home, About, Partners, pHYBi Wiki, News & Events, Resources and Contact pages. Each of these links helps visitors to quickly navigate to relevant information about the project and its activities.

Icons linking to the pHYBi project's social media channels, LinkedIn and BlueSky, are included on the right-hand side of the navigation bar, allowing users to easily connect with the project on these platforms for further updates and engagement.

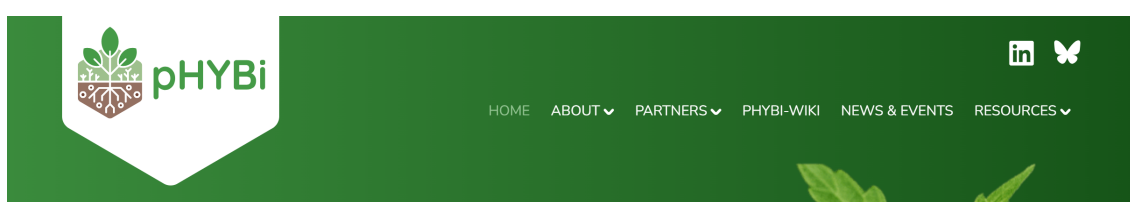


Figure 1 – Screenshot of the navigation bar of the pHYBi project website.

3. HOME

The first page visible when visitors access the pHYBi project website is the 'Home' page. It is designed with a clear and user-friendly structure to provide visitors with key information at a glance. This layout ensures that essential details are easy to find, without the need to search through the entire site.

At the top, visitors are introduced to the project's concept and objectives. This section offers a brief summary and highlights the most important facts about pHYBi. Afterwards, current news and upcoming events are prominently displayed, allowing visitors to stay up-to-date with the latest developments and activities related to the project.

At the bottom of the page, the logos of the project partners are showcased, highlighting the collaborative nature of the project.



Figure 2 – Screenshot of the homepage of the pHYBi website.



Figure 3 – Screenshot of the pHYBi key facts presented on the pHYBi website.

4. ABOUT

The 'About' section offers detailed information about the pHYBi project, giving visitors a deeper understanding of its background, objectives, and overall concept. This section also highlights the innovative approaches being explored, the case studies that demonstrate the project's

application, and the broader impact it aims to achieve. The content within the 'About' section is organized into individual pages, allowing users to explore each aspect of the project in more detail.

3.1 Background

This section provides an overview of the background of the pHYBi project, explaining the significance of phytomanagement in today's context. It addresses key questions such as why phytomanagement is critical to sustainable development and the challenges it seeks to address. This section sets the stage for understanding the importance of the project and its potential to drive positive change in different industries.

BACKGROUND

The transition to a sustainable bioeconomy faces a critical challenge: sourcing feedstocks without competing for arable land needed for food production. This issue is particularly pressing in Europe, where around 80% of land is allocated to settlements, agricultural and forestry production, and infrastructure. The scarcity of land requires innovative approaches to feedstock cultivation. Degraded, polluted, and saline soils unsuitable for food crops offer a promising alternative for industrial crop cultivation. However, the widespread adoption of industrial crops on such soils is limited by several key challenges:

Figure 4 – Explanation of the background of the pHYBi project.

3.2 Objective

This section outlines the objectives of the pHYBi project. The main objective of pHYBi is to develop an integrated circular economy approach by growing industrial crops on degraded and polluted soils. The biomass from these crops will then be used to produce high quality materials for textile applications. This innovative approach aims to simultaneously address soil regeneration and promote sustainable material production, contributing to both environmental and economic benefits.



Figure 5 – Screenshot of the pHYBi objectives, summarised on the pHYBi website.

3.3 Concept

This section describes the concept of the pHYBi project through different steps and their associated key activities:

- Site selection and monitoring
- Optimisation of phytomanagement strategies
- Biomass extraction and valorisation
- Scaling and replication

To enhance understanding, these steps are visually represented in a concept graphic, illustrating how each activity fits into the overall project framework.

CONCEPT



Starting at Technology Readiness Level (TRL) 3-4, the pHYBi project partners test, optimise and develop several phytomanagement strategies and biomass extraction processes in laboratory settings. These phytomanagement strategies are then validated in pilot field trials, while the biomass extraction processes are tested in a small to medium scale pilot plant. The project aims to reach TRL 5 by the end of the project, following the outlined methodology:

Figure 6 – Screenshot of the project website section explaining the pHYBi concept.

3.4 Innovations

The 'Innovation' section of the pHYBi website showcases the innovative aspects of the project. It provides an overview of the novel approaches and technologies being developed, emphasizing how pHYBi stands out in addressing soil regeneration, biomass valorisation, and sustainable textile production.

- 
 1. pHYBi uses **symbiotic inoculants** including endophytic fungi, plant growth promoting bacteria (PGPBs) and mycorrhizae to improve the plant growth and health, enhancing phytoremediation and generating more lignocellulosic biomass.
- 
 2. pHYBi proposes a novel hybrid concept named **nanobiophytoremediation**, using Fe- or C-based nanoparticles, the reintroduction of autochthonous microorganisms (bioaugmentation) into the soil, and the phytoextraction action of trees.
- 
 3. pHYBi proposes the use of modified nanocellulose and enables the production of **novel and innovative bio-based multifunctional protective coatings**.

Figure 7 – Overview of the innovative contribution of the pHYBi project on the project website.

3.5 Case Studies

The pHYBi project has selected several case studies as phytomanagement trials to explore diverse strategies for managing contaminated sites and to collect data. In this section of the project website, an overview of each case study, including its location, pollution history, and the specific phytomanagement strategies proposed by pHYBi, is provided. To provide further insight,

photos from the case study sites are also featured, giving visitors a visual perspective of the trials.

SALT-AFFECTED AGRICULTURAL SOILS



Keywords: Salt-affected agricultural site, Miscanthus & hemp, Bio amendments, Bacteria, Mycorrhiza, GEM models

Location: Burgos, Spain (42° 49' 2.14" N, -3° 9' 41.68" W)

Pollution History:

In the municipality of Cerezo industrial activity related to sodium sulfate production from glauberite mineral has directly impacted approximately 150 hectares of land. Additionally, agricultural soils in the surrounding area are experiencing salinity issues. Saline soils are defined by electrical conductivity values in saturated paste exceeding ECe > 4 dS/m.

Phytomanagement strategies proposed by pHYBi:

- Organic amendments (biochar, compost) to improve soil chemistry, fibre crops and rhizobacterial inoculation
- Salt-tolerant crops such as miscanthus and hemp (high lignin and fibre)
- Salt-tolerant crops such as miscanthus and hemp (high lignin and fibre)

Figure 8 – Screenshot of the overview of the pHYBi case studies that are presented on the project's website.

3.6 Impact

The 'Impact' section of the pHYBi website showcases the project's long-term objectives and the transformative potential of its innovative approaches. It highlights the environmental, economic, and social benefits of pHYBi, including soil restoration, sustainable resource use, and support for bio-based industries. This section provides a clear overview of how the project aims to drive positive change across multiple domains.

5. PARTNERS

This page of the website provides detailed information about the project partners involved in the pHYBi project, showcasing their expertise and contributions. Additionally, it highlights collaboration partners, including related projects, initiatives, and clusters that pHYBi is actively working with. This space emphasizes the importance of partnerships in achieving the project's goals and fostering innovation through collective efforts.

4.1 Consortium

In this section, the pHYBi consortium partners are presented with a comprehensive profile that includes their logo, the country where they are based and their area of expertise. Each partner's profile also includes a brief company description, an overview of their role and responsibilities within the pHYBi project, and direct links to their website and social media accounts. This format highlights the diverse expertise and contributions of each partner and demonstrates their integral role in the success of the project.



Figure 9 - Short description of the project partners on the pHYBi project website.

4.2 Collaborations

This section will be updated throughout the implementation of the pHYBi project. It is designed to highlight related projects, initiatives, and clusters by showcasing their scope and objectives, while also providing direct links to their respective websites. This space aims to foster visibility and collaboration within the wider research and innovation community.

6. PHYBI-WIKI

To provide a clear understanding of the background and foundation of the pHYBi project, the page 'pHYBi-Wiki' serves as an accessible resource for those less familiar with topics such as phytomanagement, lignocellulosic biomass, polluted soils, and the circular economy. This

section offers detailed explanations of these concepts, helping stakeholders and visitors better grasp the scope and significance of the project.

Phytomanagement

– What do the terms phytomanagement, phytoremediation and bioremediation mean?

Phytoremediation refers to the use of plants to remove, degrade, or stabilize contaminants in the environment, such as polluted soil, water, or air. It is primarily focused on cleaning up or remediating contaminated sites. Phytoremediation can involve various processes like:

- Phytoextraction: plant uptake of contaminants
- Phytodegradation: breakdown of pollutants
- Phytostabilization: immobilization of harmful substances, reducing their spread

Bioremediation is a broader term that involves using living organisms—plants, microbes, or fungi—to clean up pollutants in the environment.

Phytomanagement, on the other hand, is a broader concept that not only focuses on remediating pollutants (like in phytoremediation) but also on utilizing plants for land management and recovery purposes, such as biomass production. Phytomanagement might involve planting specific crops or vegetation to restore soil fertility, prevent erosion, or promote sustainable land use practices in addition to cleaning up contaminants. It offers a cost-effective alternative to traditional cleanup methods and provides possible applications for a bio-based economy. However, it can be time-consuming and limited by the plants' growth rate and root depth.

+ What mechanisms do plants use to remove contaminants from soil or water?

+ What role does phytomanagement play in the pHYBi project?

+ What technologies does pHYBi use to enhance phytoremediation?

+ How do soil microorganisms improve phytoremediation efficiency?

+ How does phytoremediation contribute to sustainable land use?

+ What role does phytomanagement play in bioeconomy (e.g., using biomass for industrial purposes)?

Figure 10 – Screenshot of the pHYBi-wiki included in the project website.

7. NEWS & EVENTS

This page serves as a hub for updates on the pHYBi project, with news on project progress, results, milestones, recently completed deliverables and upcoming events. It will also include updates from related projects and initiatives. In addition, blog posts on specific project-related topics will be published here, providing deeper insights and engaging content for visitors.

pHYBi at the European Mission Soil Week 2024

📅 20 December 2024 ⌚ 11:29 ➡ [News](#)

In December 2024, the EU Mission Soil Week took place in Brussels, highlighting the crucial role of soil in mitigating climate change and supporting biodiversity. Key discussions revolved around food security, ecosystem resilience and sustainable soil management. The pHYBi project, which focuses on phytomanagement for a bio-based textile industry, participated in the discussion and was represented by two of its project partners: Idener and the University of Burgos (UBU).



Figure 11 – Screenshot of the first news article uploaded to the pHYBi website.

8. RESOURCES

This page contains public resources produced by the pHYBi project, including deliverables, publications and promotional materials that will be uploaded and made available for download.

7.1 Deliverables

This section will feature all public deliverables produced by the pHYBi project partners, uploaded after review and approval. This ensures effective knowledge sharing and accessibility for stakeholders.

7.2 Results & Publications

This section will provide links to all publications produced during the pHYBi project. Additionally, other project materials and results, such as promotional materials (flyers, roll-ups, etc.) and learning resources, will be made available here.

Communication materials

pHYBi Logo in SVG-Format



This version is optimized for use on dark or black backgrounds.



This version is optimized for use on light or white backgrounds.

Figure 12 – Screenshot of the pHYBi logo integrated into the website for downloading.

9. CONTACT

This section provides contact details for reaching out to the pHYBi consortium, offering a direct way to connect with the project team for inquiries or collaboration opportunities.

10. FOOTER

The footer of the project website contains links to the contact details, icons linking to the pHYBi social media channels, as well as links to the imprint, privacy policy, funding statements, and logos.

11. CONCLUSION

The pHYBi project website is designed to be an informative and accessible platform, showcasing the project's objectives, innovative approaches, and ongoing progress. With a clear structure and user-friendly navigation, it provides detailed insights into the consortium's work, case studies, and expected impacts. By providing resources, news updates and opportunities for collaboration, the website serves as a hub for stakeholders, researchers and the public to engage with the project's vision of sustainable plant management and circular economy practices. It reflects the collaborative and forward-looking spirit of the pHYBi initiative, ensuring transparency and promoting knowledge sharing. Project partner SEZ is responsible for keeping the website up to date and ensuring that it contains the latest information from all project partners.