Deliverable D7.3 – Practice Abstracts – batch 1

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*R — Document, report; DMP — Data Management Plan; DATA — data sets, microdata, etc; DEC —Websites, patent filings, videos, etc.

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Document history

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3.	10/02/2025	Andrea Motola (Enspire), Abi Glaser (Enspire), Gavin Moroney	Comments to PAs linked to T3.1 and T3.3
4.	12/02/2025	Artur Sobolewski, Agnieszka Bądel (PRO CIVIS)	PAs linked to T4.2.1 and T4.2.2 first draft
5.	12/02/2025	Gavin Moroney	Comments to PAs linked to T4.2.1 and T4.2.2
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7.	18/02/2025	Gavin Moroney, Artur Sobolewski, Agnieszka Bądel, Marie Šmídová, Anna Nejedlá	Final adjustments of PAs linked to T3.1, T3.3, T4.2.1 and T4.2.2
8.	21/02/2025	Gavin Moroney	D7.3 First complete draft
9.	26/02/2025	Abi Glaser, Andrea Motola, Lara Amariuti, Gavin Moroney	Final version of D7.3

Contents

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List of abbreviations

DRC	Democratic Republic of Congo
EIP-AGRI	European Innovation Partnerships for Agricultural Productivity and Sustainability
EU	European Union
EU CAP Network	European Union Common Agricultural Policy Network
IBF	Irish Bioeconomy Foundation
LCA	Life Cycle Assessment
LCC	Life Cycle Costing
PIN	People In Need
PLA	Polylactic Acid
SDG	Sustainable Development Goals
SWM	Solid Waste Management

Introduction

This document outlines the work completed under Work Package 7 in relation to dissemination activities, specifically the publishing of Practice Abstracts that provided a summary of the main findings, objectives, results, and implications/recommendations of completed tasks within the project so far. The following actions were taken to proactively bring the results of the project to the EIP-AGRI Project Database available online to boost innovation and knowledge exchange.

As was agreed in the Grant Agreement, this deliverable contains examples 'First Practice Abstracts' of the project in the EIP-AGRI format to allow end user (researchers, general public, rural areas and other EIP groups) to easily engage with Bio4HUMAN project and its future activities. The purpose of these practice abstracts contained in this deliverable is to answer to real needs from the field, stimulate knowledge exchange and spread innovative solutions across the EU. This should be as interesting as possible for end-users, using understandable language and pointing out elements which may be potentially beneficial and useful.

Deliverable 7.3 Practice Abstracts – batch 1 (M3 – M15)

This deliverable involved creating interesting and accessible Practice Abstracts that will be beneficial to end-users, researchers and the general public who want to acquire more details about Bio4HUMAN. IBF as deliverable leader, first identified in partnership with Enspire, key milestones of the project that the Practice Abstracts should capture and which would be informative for end users.

Practice abstracts in the EIP-AGRI common format are important to:

- Help projects share their results in an easily understandable way for farmers, foresters, rural communities and others from practice;
- Foster knowledge flows, and share project results more widely and at a faster pace;
- Support the development of project proposals with added value, avoiding duplication of ongoing or completed projects;
- Facilitate networking by connecting project partners with farmers, foresters, and others from practice;
- Answer to real needs from the field.

For this deliverable, four Practice Abstracts were chosen. These included the following themes and Work Packages and the associated task leads:

- T3.1 Summary of the mapping of the key stakeholders' exercise (PIN);
- Task 3.3 Defining the needs of the humanitarian sector in SWM (solid waste management) and the current status of how they are being addressed (PIN);

- T4.1 Setting the scope of potential bio-based innovative technological solutions and bio-based systems (PROCIVIS);
- T4.2.2 Identification of supply chains gaps in SWM system for humanitarian action (PROCIVIS);
- Before meeting PIN and PROCIVIS, the partners involved with the above milestones, IBF consulted the EU CAP Network to acquire a better understanding and definition of 'Practice Abstracts', which was then presented to the partners. The presentation to partners provided key requirements as part of the Practice Abstracts, including good examples of templates to consider and what type of information should be summarised as part of the 'Practice Abstract'. Instructions were given to partners to finalise and summarise their work in under 2,000 characters, along with specific objectives, methodologies, objectives, challenges, and opportunities provided in the below presentation.

Work Packages Explained

For context, Bio4HUMAN is an interdisciplinary project with the main objective to provide humanitarian and bio-based sectors´ stakeholders with science-based information on the application potential, sustainable performances, and circularity of bio-based products and systems, suitable for humanitarian purposes. The objective of Work Package 3 – Mapping the ground + Scoping exercise Phase 1 - was to map the key stakeholders in target areas, develop a detailed scoping plan and conduct the first phase of the scoping exercise which involved the needs assessment of the humanitarian sector in SWM and the review of the current status of these needs are being addressed. The purpose of the stakeholder mapping (T3.1) was to understand, identify and prioritise the stakeholders within humanitarian and bio-based sectors in target areas (DRC, South Sudan and in Europe) and to develop strategies to successfully and meaningfully engage with them.

For task T3.3, which is phase 1 of Scoping exercise, the main objective was to define the needs of the humanitarian sector in SWM and the current status of how they are being addressed. The first step was to conduct a detailed literature review on SWM in humanitarian settings. EU and national level sources were used, along with focus groups, community members and local authorities. Throughout the task, information was also collected from government institutions and non-government agencies, civil society organisations and one to one interviews and consultations.

Work Package 4 (Scoping exercise) was conducted to better understand which bio-based innovative technological solutions and bio-based systems are environmentally friendly that may be applicable under different humanitarian contexts. T4.2.1 (The identification process of solutions) aimed to identify the already existing bio-based solutions and examine which of them could can respond to the needs and expectations of the humanitarian actors and the beneficiaries of

humanitarian actions. T4.2.2 (Identification of supply chains gaps in SWM system for humanitarian action) consisted of analysis of the different links in the supply chain, the techniques used to manage the supply chains and the current techniques and technologies used to manage solid waste that is generated at each supply stage.

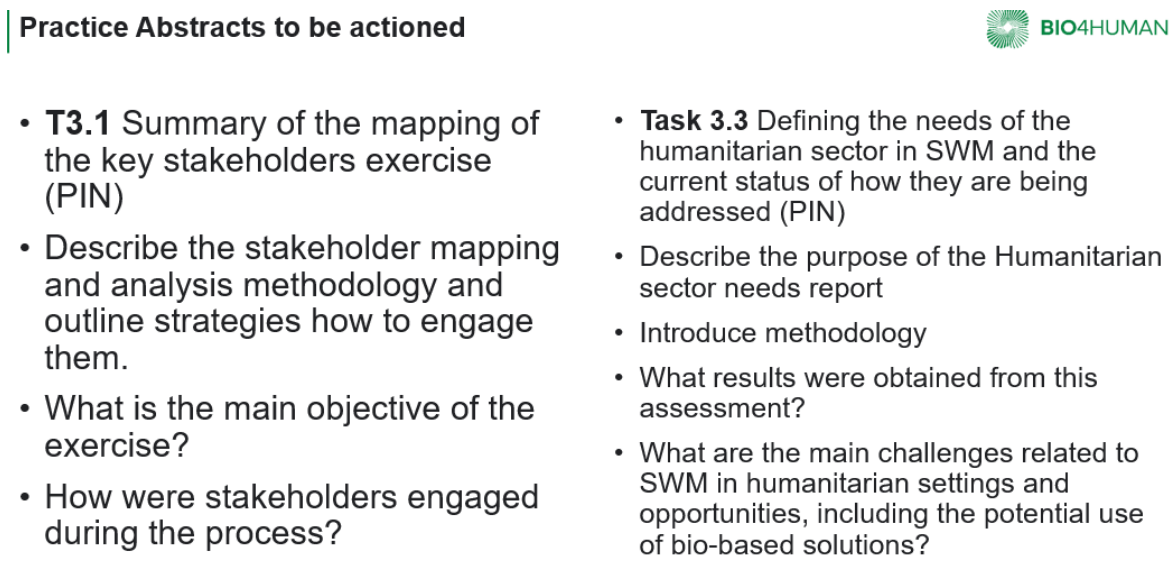

Figure 1. Example of key requirements and guidance on practice abstracts presented to partners

Figure 2. An example of other Practice Abstract examples available on the EU CAP Network Database

After reviewing and editing drafts from partners, IBF, along with Enspire, approved the final text of the Practice Abstracts, which can be viewed below. Enspire uploaded the final text, which can be viewed here as the first batch of Practice Abstracts to EIP-AGRI portal.

Practice Abstracts Content

Practice Abstract 1: Mapping Stakeholders to Explore Sustainable Bio-Based Solutions in Humanitarian Settings

Description of the Practice Abstract[1]: The project mapped 292 key stakeholders in the DRC, South Sudan, and Europe, creating a stakeholder database for research on bio-based solutions suitable for solid waste reduction and management in humanitarian contexts.

Summary:

The Bio4HUMAN project began by mapping key players in the Democratic Republic of Congo (DRC), South Sudan and Europe who could provide valuable insights to help identify bio-based solutions suitable for solid waste management (SWM) in humanitarian settings. Through this effort, a database of 292 stakeholders from academia, industry, community (including humanitarian actors) and government/policy makers was created and organised according to the Quadruple Helix model. This mapping laid the foundation for a collaborative approach that bridges humanitarian efforts and bio-based innovation.

Stakeholder mapping served two key purposes:

- Stakeholders were categorised by power and interest, informing tailored engagement strategies. The consortium continues to engage these stakeholders throughout the project using scoping exercises, feasibility studies and SWOT analyses.
- Identified stakeholders can serve as amplifiers of the project's results by promoting its findings, sharing best practices, and encouraging the adoption of bio-based solutions within their networks.

Bio4HUMAN aligns with Sustainable Development Goals (e.g., SDG6, SDG11, SDG13) by addressing the environmental impact of humanitarian operations, particularly in SWM. The project aims to offer evidence-based guidance on applying bio-based products for humanitarian purposes, focusing on their sustainability and circularity. By engaging bio-based sector stakeholders and circular economy experts, Bio4HUMAN fosters cooperation between humanitarian aid operators and the bio-based sector. The stakeholder mapping process is ongoing, with the database evolving as new stakeholders are identified. This collaborative approach helps develop innovative bio-based solutions to enhance the environmental outcomes of humanitarian action in crisis regions. Active stakeholder engagement is crucial to foster understanding of diverse perspectives, increase legitimacy and promote buy-in for successful implementation.

[1] Practice Abstract is linked to Bio4HUMAN T3.1.

Practice Abstract 2: Humanitarian Sector Needs Assessment Report

Description of the Practice Abstract[2]: The aim of this work was to provide stakeholders in the humanitarian and bio-based sectors with science-based information on the application potential, sustainable performances and circularity of bio-based products and systems suitable for humanitarian purposes.

Summary: The Bio4HUMAN project conducted a needs assessment in the humanitarian sector from January to July 2024, focusing on solid waste management (SWM) in the and South Sudan. The assessment aimed to identify challenges, opportunities, systems, and practices in SWM in humanitarian settings and explore the application of bio-based solutions and waste reduction strategies.

Key results included:

- Development of primary data collection tools, replicable in future SWM assessments targeting communities, governments, academia, businesses, and humanitarian actors.
- Generation of key findings to further inform the project goal of developing a set of bio-based solutions with positive impact on SWM and potential to be applied in humanitarian context.

The assessment revealed challenges such as inadequate infrastructure, low awareness, lack of funding and insufficient coordination among local actors. Opportunities for improvement were also identified, including waste reduction strategies, innovative recycling solutions and sustainable packaging alternatives. The report emphasizes the need to integrate bio-based solutions into SWM practices to enhance sustainability and reduce environmental impacts. Stronger coordination among governments, humanitarian organizations and the private sector is crucial for effective and scalable systems. Engaging local communities and authorities is essential, as well as improving data collection, monitoring, and fostering behavioural change. While implementing these solutions may involve initial costs (e.g., investment in materials or infrastructure), the long-term benefits include reduced environmental pollution, improved public health and more sustainable waste management systems.

The findings serve as a foundation for future initiatives aimed at enhancing SWM in humanitarian contexts. The identified stakeholders will be further engaged by Bio4HUMAN in the future to assess the feasibility of selected bio-based solutions.

[2] Practice Abstract is linked to Bio4HUMAN T3.3.

Practice Abstract 3: The preliminary list of bio-based solutions relevant to waste management in the humanitarian context

Description of the Practice Abstract[3]: This work is aimed at identifying the already existing bio-based solutions and indicating which of them could respond to the needs and expectations of the humanitarian actors and the beneficiaries of humanitarian actions.

Summary: The Bio4HUMAN consortium conducted an extensive scoping exercise for bio–based solutions having the potential to be applied under the humanitarian context, with the simultaneous positive effect on solid waste management (SWM). The scoping took the form of surveying companies, analysing the results of European projects, studying the various data sets, and viewing economical awards. The aim was to find solutions that contribute to a more circular bioeconomy and exercise features of recyclability, biodegradability, compostability and sustainability. Bio-based solutions with excellent functional properties, comparable with fossil-based solutions or even exceeding qualities, have been sought after.

The consortium catalogued 81 bio-based solutions potentially applicable in the humanitarian context. Based on their features and purpose, the innovative solutions have been grouped in six clusters, including multipurpose packaging, food and drinks packaging, construction related products and small-scale technologies.

The final list of 25 solutions was established after a diligent consultation process with the participation of humanitarian organizations. The list features inter alia solutions:

a) Following actual trends of the bio-economy, like packaging products utilising seaweed and corn;

b) Combining both the product side and the technology side, allowing for the installation to be easily transferred to the destination location (PLA bottles for water + small water bottling unit for blowing and filling PLA bottles);

c) Being of particular importance for humanitarian interventions in the protracted crisis/recovery phases (bio–based building insulation);

d) Allowing for the local valorisation of biomass and tailored to local availability of waste resources (different types of biogas digesters).

The solutions will undergo detailed LCA and LCC analysis. They will also form the basis for further reaching governance and societal considerations. It is expected that the Bio4HUMAN recommendations, which are still to follow, will strongly

[3] This Practice Abstract reflects the work under Bio4HUMAN T4.2.1.
Deliverable D4.1, linked to T4.2.1, will be submitted shortly after this Practice Abstract, and its content will be available in open access in Zenodo and on our project website.

advocate for the bio–based products and technologies to be included in the humanitarian supply chains and interventions in protracted crisis situations.

Practice Abstract 4: Analysis of the humanitarian supply chain for potential application of bio-based solutions

Description of the Practice Abstract[4]: This task looks at the identification of both existing solutions and supply chain gaps in the SWM system for humanitarian action consisting of analysis of the different links and techniques used to manage in the supply chain.

Summary: Maintaining the uninterrupted supply chain in humanitarian operations is a crucial factor in providing effective aid. In that context, sustainability might seem to be the secondary issue. However, from an environmental perspective, the humanitarian sector has already significantly contributed to environmental pollution and that is a challenge that should also be addressed. The more that can be done throughout the supply chain, the less amount of waste that is left in the destination countries.

For this purpose, in the last quarter of 2024, a multi-factor analysis of the humanitarian supply chain was conducted within the Bio4HUMAN project.

The idea behind the analysis was to investigate which tools and technologies are used to manage the supply chain, especially in context of Solid Waste Management (SWM), which led to the identification of gaps in waste treatment where bio-based solutions (products/technologies) could be potentially applied. The research involved a variety of tools: a literature review, interviews with the humanitarian supply chain leaders and collecting data on SWM from humanitarian operations through multiple studies.

The challenges of the investigation related to some stages of the supply chain being underrepresented in the analysed sources. Nevertheless, it can be concluded that the longer the supply chain is, the more difficult it is to manage, and consequently, the more quantity of waste that is produced.

For this reason, it is important to note that sufficient attention should be given to the conceptualisation and planning of supplies, as this may help to reduce waste, e.g. the use of plastic, which is one of the greatest waste challenges in humanitarian operations. There are also other challenges in SWM that should be considered, like insufficient funding, the absence of comprehensive waste data and standardised reporting and proper monitoring systems. Coordination mechanisms among NGOs, governments and private entities need to be strengthened to avoid duplication of efforts.

[4] This Practice Abstract reflects the work under Bio4HUMAN T4.2.2.
Deliverable D4.2, linked to T4.2.2, will be submitted in March 2025 and its content will be available in open access in Zenodo and on our project website.

In short, the environmental awareness and application of relevant bio-based solutions should start at the very first stage of the supply chain, because the environment of many destination countries does not allow the introduction of new solutions, especially small and big scale technologies.

Annex 1 - EIP-AGRI database extract

EU CAP NETWORK

PROJECT - RESEARCH AND INNOVATION

Identifying bio-based solutions for waste management applicable to humanitarian sector

PROJECT IDENTIFIER: 2024HE_101135144_BIO4HUMAN

Discover website

Innovation, knowledge exchange & EIP-AGRI

ONGOING | 2024 - 2026

Other, Democratic Republic of Congo and South Sudan

Objectives

As the solid waste management crisis is growing in its urgency, humanitarian aid practitioners are faced with the question of how to manage environmental challenges linked with aid that is being shipped across various humanitarian settings.
One of the sound solutions how to address this challenge is to open up a streamline of cooperation between humanitarian aid operators and the bio-based sector allowing them to explore the application potential of bio-based products, systems, and innovative technological solutions.

Bio4HUMAN aims to contribute to the identification of bio-based solutions for solid waste management that have the potential to be applicable in various humanitarian settings. To achieve this goal, Bio4HUMAN will conduct a scoping exercise that will come up with a list of solutions but also identify existing supply chain gaps. Following that, it performs life cycle assessments of the proposed solutions and evaluates their applicability with regard to socio-economic and governance aspects. To explore if solutions fit the purpose of key solid waste management stakeholders and to explore the possibility of their acceptance by the community, local businesses, and local authorities, Bio4HUMAN conducts a feasibility evaluation process in

2 African locations. Simultaneously, the project will develop a replication roadmap that will contribute to the future replicability of the solutions identified.

Altogether, all of the Bio4HUMAN’s actions will help to improve ways of addressing waste management challenges under humanitarian contexts and to the reduction of waste littered in the environment. In the long run, Bio4HUMAN is expected to contribute to the development of innovative and sustainable value chains that will benefit consumers and citizens in Europe and beyond.

Activities

Bio4HUMAN's list of activities includes:

1. Conduct a scoping exercise to develop a list of solutions and identify existing supply chain gaps in solid waste management. So far, there is no study on the topic.
2. Perform life cycle assessments of the proposed solutions and evaluate their applicability regarding socio-economic, and governance aspects.
3. Explore if solutions fit the purpose of key solid waste management stakeholders and explore the possibility of their acceptance by the community, local businesses, and local authorities. Bio4HUMAN will conduct a feasibility evaluation process in 2 African locations.
4. Develop and disseminate a set of replication tools for humanitarian actors (funding and supporting organisations) willing to explore and implement innovative bio-based solutions to perform sustainably and offer circularity when delivering humanitarian aid.

Project details

Main funding source
Horizon Europe (EU Research and Innovation Programme)

Type of Horizon project
Multi-actor project

Project acronym
Bio4HUMAN

CORDIS Fact sheet

Project contribution to CAP specific objectives

- Climate change action
- Environmental care
- Fostering knowledge and innovation

Project contribution to EU Strategies

Achieving climate neutrality

EUR 1 509 809.00

Total budget

Total contributions including EU funding.

EUR 1 509 809.00

EU contribution

Any type of EU funding.

Project keyword(s)

Circular economy, incl. waste, by-products and residues

Climate change (incl. GHG reduction, adaptation and mitigation, and other air related issues)

Resources

Links

LinkedIn

Audiovisual Material

Project Video

4 Practice Abstracts

1. Mapping Stakeholders to Explore Sustainable Bio-Based Solutions in Humanitarian Settings

The project mapped 292 key stakeholders in DRC, South Sudan, and Europe, creating a stakeholder database for research on bio-based solutions suitable for solid waste reduction and management in humanitarian contexts.

Summary

Bio4HUMAN project began by mapping key players in the Democratic Republic of Congo, South Sudan, and Europe who could provide valuable insights to help identify bio-based solutions suitable for solid waste management in humanitarian settings. Through this effort, a database of 292 stakeholders from academia, industry, community (including humanitarian actors), and government/policymakers was created and organized according to the Quadruple Helix model. This mapping has laid the foundation for a collaborative approach that bridges humanitarian efforts and bio-based innovation.

Stakeholder mapping has served two key purposes:

- Stakeholders were categorized by power and interest, informing tailored engagement strategies. The consortium continues to engage these stakeholders throughout the project using scoping exercises, feasibility studies, and SWOT analyses.
- Identified stakeholders can serve as amplifiers of the project's results by promoting its findings, sharing best practices and encouraging the adoption of bio-based solutions within their networks.

Bio4HUMAN aligns with Sustainable Development Goals (e.g., SDG6, SDG11, SDG13) by addressing the environmental impact of humanitarian operations, particularly in solid waste management. The project aims to offer evidence-based guidance on applying bio-based products for humanitarian purposes, focusing on their sustainability and circularity. By engaging bio-based sector stakeholders and circular economy experts, Bio4HUMAN fosters cooperation between humanitarian aid operators and the bio-based sector. The stakeholder mapping process is ongoing, with the database evolving as new stakeholders are identified. This collaborative approach helps develop innovative bio-based solutions to enhance the environment.

D3.1 Stakeholder Analysis

2. Humanitarian Sector Needs Assessment Report

The aim of this work is to provide stakeholders in the humanitarian and bio-based sectors with science-based information on the application potential, sustainable performances and circularity of bio-based products and systems suitable for humanitarian purposes.

Summary

The Bio4HUMAN project conducted a needs assessment in the humanitarian sector from January to July 2024, focusing on solid waste management (SWM) in the Democratic Republic of Congo and South Sudan. The assessment aimed to identify challenges, opportunities, systems and practices in SWM in humanitarian settings and explore the application of bio-based solutions and waste reduction strategies.

Key results included:

- Development of primary data collection tools, replicable in future SWM assessments targeting communities, governments, academia, businesses and humanitarian actors.
- Generation of key findings to further inform the project goal of developing a set of bio-based solutions with positive impact on SWM and potential to be applied in humanitarian context.

The assessment reveals challenges in waste management, including poor infrastructure, low awareness, insufficient funding, and weak local coordination. It also identifies opportunities like waste reduction, innovative recycling, and sustainable packaging. The report urges integrating bio-based solutions to enhance sustainability and reduce environmental impacts. It calls for better collaboration among governments, humanitarian organizations, and the private sector, along with community engagement, improved data collection, and behavioral change. Although initial investments are needed, long-term benefits include reduced pollution, better public health, and more sustainable systems, forming a foundation for future initiatives.

D3.3 Humanitarian Sector Needs Assessment Report

D3.3 Annex 1 – Bio4HUMAN KII – Businesses

D3.3 Annex 2 – Bio4HUMAN KII – Camp representatives

D3.3 Annex 3 – Bio4HUMAN KII – Community leaders

D3.3 Annex 4 – Bio4HUMAN KII – Government and Academia

D3.3 Annex 5 – Bio4HUMAN KII – Health Staff

D3.3 Annex 6 – Bio4HUMAN KII – Humanitarian Actors

D3.3 Annex 7 – Bio4HUMAN KII – EU Based Humanitarian Actors

D3.3 Annex 8 – Bio4HUMAN KII – Local governments

D3.3 Annex 9 – Bio4HUMAN NA FGD – Community Health Volunteers

D3.3 Annex 10 – Bio4HUMAN NA FGD – Community

Additional information

To view Annex 11 – Survey – Humanitarian Ogranisations Needs Identification and Annex 12 – Observation tool please visit our resource page .

For guidance on annexes tools please reach out to **kld@peopleinneed.net.**

3. The preliminary list of bio-based solutions relevant to waste management in the humanitarian context

This work is aimed at identifying the already existing bio-based solutions and indicating which of them could respond to the needs and expectations of the humanitarian actors and the beneficiaries of humanitarian actions.

Summary

The Bio4HUMAN consortium conducted a thorough scoping study to identify bio-based solutions for humanitarian contexts that can also improve solid waste management. They surveyed companies, analyzed European projects, reviewed datasets, and examined economic awards to find solutions that support a circular bioeconomy with features like recyclability, biodegradability, compostability, and sustainability. In total, they catalogued 81 potential solutions, which were organized into six clusters, including multipurpose packaging, food and drinks packaging, construction-related products, and small-scale technologies.

The final list of 25 solutions has been established after diligent consultation process with the participation of humanitarian organizations. The list features inter alia solutions:

- Following actual trends of the bio-economy, like packaging products utilising seaweed and corn;
- Combining both the product side and the technology side, allowing for the installation to be easily transferred to the destination location (PLA bottles for water + small water bottling unit for blowing and filling PLA bottles);
- Being of particular importance for humanitarian interventions in the protracted crisis/recovery phases (bio-based building insulation);
- Allowing for the local valorisation of biomass and tailored to local availability of waste resources (different types of biogas digesters)

The solutions will be rigorously evaluated using LCA and LCC analyses, and will inform broader governance and societal discussions. Upcoming Bio4HUMAN recommendations are expected to strongly promote incorporating bio-based products and technologies into humanitarian supply chains during prolonged crises.

4. Analysis of the humanitarian supply chain for potential application of bio-based solutions

This task looks at the identification of both existing solutions and supply chain gaps in the SWM system for humanitarian action consisting of analysis of the different links and techniques used to manage in the supply chain.

Summary

Effective humanitarian aid relies on an uninterrupted supply chain, yet the sector significantly contributes to environmental pollution. Enhancing sustainability throughout the supply chain can help reduce waste in destination countries.

For this purpose, in the last quarter of 2024, a multi-factor analysis of the humanitarian supply chain was conducted within the Bio4HUMAN project.

The analysis examined the tools and technologies used in managing the supply chain, particularly for Solid Waste Management (SWM), to identify waste treatment gaps where bio-based solutions could be applied. The research utilized a literature review, interviews with humanitarian supply chain leaders, and data from multiple studies on SWM in humanitarian operations.

The challenges of the investigation related to some stages of the supply chain being underrepresented in the analysed sources. Nevertheless, it can be concluded that the longer the supply chain is, the more difficult it is to manage, and consequently, the bigger the quantities of waste that are produced.

For this reason, it is important to note that sufficient attention should be given to the conceptualization and planning of supplies, as this may help to reduce waste, e.g. the use of plastic, which is one of the greatest waste challenges in humanitarian operations.

The environmental awareness and application of the relevant bio-based solutions should start at the very first stage of the supply chain, also because the situation of the destination countries sometimes simply does not allow the introduction of new solutions, especially small and big scale technologies.

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Website Other

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Project partner

Website Other

Polish Humanitarian Action (PAH)

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Website NGO

AIMPLAS

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