



BIO4HUMAN

Scoping plan

Due date: 31/03/2024

Responsible partner: ITENE



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List of abbreviations

| | |
|---------|---|
| ACAPS | Author, Context, Audience, Purpose, and Significance |
| AIMPLAS | Asociacion de Investigacion de Materiales Plasticos y Conexas |
| BIC | Bio-based Industries Consortium |
| CAP | Common Agricultural Policy |
| CBE | Circular Bio-based Europe |
| CBE JU | Circular Bio-Based Europe Joint Undertaking |
| CEN | European Committee for Standardization |
| DG ECHO | Directorate-General for European Civil Protection and Humanitarian Aid Operations |
| DO | Direct Observation |
| DRC | Democratic Republic of Congo |
| EHA | Environment and Humanitarian Action |
| FGD | Focus Group Discussion |
| GA | Grant Agreement |
| IBF | Irish Bioeconomy Foundation |
| ICRC | International Committee of the Red Cross |
| IFRC | International Federation of Red Cross and Red Crescent Societies |
| ITENE | Instituto Tecnológico del Embalaje, Transporte y Logística Paterna |
| LCA | Life Cycle Assessment |
| MEAL | Monitoring, evaluation, accountability, and learning |
| MIRA | Multi-cluster / sector Initial Rapid Needs Assessment |
| OCHA | United Nations Office for the Coordination of Humanitarian Affairs |
| PAH | Polska Akcja Humanitarna Fundacja |
| PE | Polyethylene |
| PIN | People in Need |
| PP | Polypropylene |
| RCRC | Red Cross and Red Crescent Movement |
| SWM | Solid Waste Management |
| UC | Universidad de Cantabria |
| UN | United Nations |
| UNEP | United Nations Environment Program |
| UNICEF | The United Nations International Children's Emergency Fund |
| USAID | United States Agency for International Development |

| | |
|------|--|
| USDA | United States Department of Agriculture |
| WASH | Water, Sanitation and Hygiene |
| WFD | Waste Framework Directive |
| WHO | World Health Organisation |
| WP | Work Package |
| WREC | Waste Management Measuring, Reverse Logistics, Environmentally Sustainable Procurement and Transport, and Circular Economy |
| WWF | World Wide Fund for Nature |

1. Introduction

This document presents the deliverable D3.2 “Scoping plan” The objective of this deliverable is to outline the objectives, timetable, scoping phase methodologies and also methods that will be used to supply the information from project locations to the partners involved in scoping exercise in the most effective manner. It helps project partners but also key stakeholders identified in D3.1 understand the purpose and parameters of Bio4HUMAN and ensures that all partners and stakeholders have a clear understanding of what will be covered during the scoping process of identifying bio-based solutions for solid waste management in humanitarian applications. The deliverable also includes xxx.

2. Objectives and scoping statement

The overall objective of Bio4HUMAN is to provide sustainable bio-based solutions for solid waste management (SWM) with potential application to and suitable for humanitarian sector purposes. In this sense, in the first phase of the project, a scoping plan for Bio4HUMAN is defined and is the work exposed on this deliverable. This scoping plan includes the following: objectives, methods that will be used to collect and analyse data from the bio-based sector and humanitarian aid sector, a scope statement, a timeline for scoping, and how results will be reported and shared with key stakeholders identified in T3.1, as well as risks and mitigations measures. This plan is intended to be used as a guide throughout the duration of the project, primarily during WP4. **Error! Reference source not found.** outlines the conceptual flow of Bio4HUMAN, which identifies that the scoping exercise will be developed in four phases.

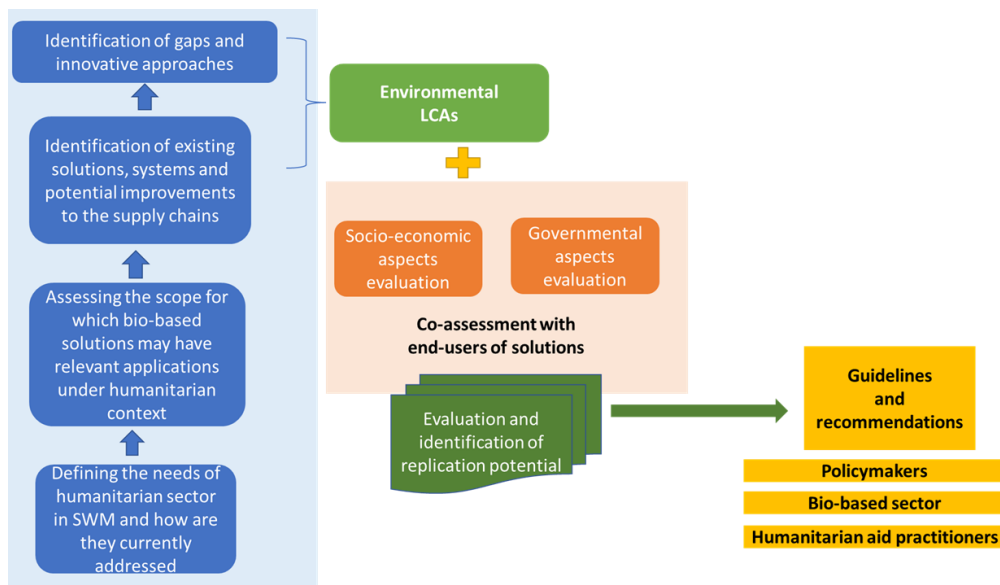


Figure 1. BIO4HUMAN conceptual flows

This deliverable is a prerequisite step that will feed the following tasks of WP5 (LCA of innovative bio-based solutions) and WP6 (Socio-economic and governance aspects evaluation). Work to accomplish the targets implies literature review, as well as field data collection (from humanitarian actors, governmental entities, local authorities, community members) in order to obtain and assess what the humanitarian sector needs in terms of Solid Waste Management.

Bio4HUMAN scoping exercise is divided into 4 phases (Figure 2):

1. Humanitarian needs assessment (T3.3);
2. Setting the scope of potential bio-based solutions and systems (T4.1);
3. Identification of existing solutions and supply chain gaps (T4.2); and
4. Gaps identification (T4.3).

For the development of the phases 2-4, a timeline for the scoping plan has been prepared, as well as the division of the work among the partners (see section 4).

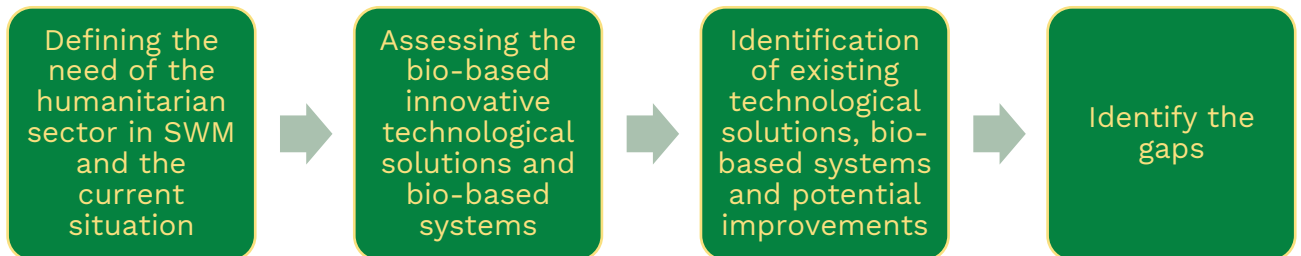


Figure 2. Scoping exercise

2.1 Phase 1: Defining the needs of humanitarian sector in SWM and how they are currently addressed (T3.3)

The first phase of the scoping exercise (T3.3) will be based on the analysis of relevant information that can help to set the needs of the humanitarian sector with regard to SWM and how they are currently addressed. The data collection will comprise both primary and secondary data collection methods. Primary data will include both qualitative and quantitative data whose sources will be a review of relevant literature as well as project, distribution, and procurement information from humanitarian actors and government representatives (if and where accessible). Secondary data will be primarily collected through qualitative KIIs, FGDs, and observations.

Firstly, a detailed literature review (including grey literature sources such as reports, working papers, government documents, speeches, and white papers from DRC, South Sudan, and EU) will be conducted on SWM in humanitarian settings. *Secondly*, qualitative data collection will be carried out by PAH and PIN in South Sudan, DRC, and Europe (focus group discussions, observations, KIIs) with community members, local authorities, government/policymakers, and humanitarian actors (e.g. international and national NGOs, UN agencies, clusters, donors). Where possible, the team will try to collect quantitative secondary data sources during KIIs with humanitarian actors and local authorities. The stakeholders for qualitative data collection, and also sources of grey literature and quantitative data, have already been identified and described in the Stakeholder analysis (D3.1), delivered in M3. The Stakeholder database (expansion of the Annex A of D3.1- List of stakeholders) is an internal tool, as it contains contact details of stakeholders, which will serve as a baseline for the future tailored work with key stakeholders from humanitarian and bio economy sectors. The Stakeholder analysis contains a) stakeholder

description within four main groups: academia, the humanitarian community, industry, and government/policymakers; *b*) stakeholder categorisation (based on the power-interest analysis) and *c*) strategies to engage the stakeholders at different phases of Bio4HUMAN. For the scope of the first phase of the scoping exercise (T3.3), PAH and PIN have mapped key stakeholders in DRC/South Sudan and Europe.

T3.3 will start with establishing a research strategy in order to select relevant sources (including grey literature at the EU and national level). This will include e.g.: Scopus, Web of Science, Google Scholar, ScienceDirect (technical sources), as well as UNEP, Reliefweb, EEcentre, EHAconnect, WHO, or European Commission (focusing on the humanitarian sector). These sources are already listed in the GA, but PIN and PAH will in the beginning of T3.3 identify additional sources as well.

More specifically, Bio4HUMAN will kick off its T3.3 work with the following grey literature included in Table 1:

Table 1: List of grey literature

| Literature |
|---|
| The Sphere Handbook: Humanitarian Charter and Minimum Standards in Humanitarian Response (Sphere Association) |
| Guidance on the operationalisation of the minimum environmental requirements and recommendations for EU-funded humanitarian aid operations (DG ECHO) |
| The Green Recovery and Reconstruction Toolkit (WWF) |
| ELHRA's Humanitarian Innovation Fund Gaps in WASH in Humanitarian Response (2021 Update) |
| ELHRA's Innovation Opportunities in Solid Waste Disposal in Humanitarian Settings (2022) |
| Managing Solid Waste: Sector Specific Guidelines for the Red Cross Red Crescent (IFRC) |
| Waste management and reverse logistics in the humanitarian context (WREC) |
| EHA Connect- the first comprehensive online repository of environment in humanitarian action (EHA) tools and guidance that was produced as part of the Coordination of Assessments of Environment in Humanitarian Action Initiative |

Secondly, PIN has prepared a detailed methodology matrix for T3.3 (including questionnaires for KIIs), based on consultations with other Bio4HUMAN partners (namely PROCIVIS, IBF, and ITENE), that will serve as the main leading document for the qualitative data collection. This document is available upon request and for internal use only.

Qualitative data collection will be conducted, using the following methodology:

1. Key informant interviews (KIIs)

KIIs (with humanitarian actors based in South Sudan, DRC, and Europe, and government representatives/local authorities). Relevant quantitative secondary data sources will be collected from relevant stakeholders during KIIs if available.

PIN Global MEAL Advisor has designed the KII questionnaires together with PAH MEAL and program teams, to be conducted face to face with humanitarian actors, government representatives/policy makers, local authorities and SWM businesses in South Sudan, and DRC (as identified during T3.1). For actors based in Europe the KIIs will be conducted remotely (using Teams/Zoom or phone). The tailored-made questionnaires were designed based on the comments and inputs from other Bio4HUMAN partners (mainly PROCIVIS and ITENE). The KII questionnaires will be adjusted, if needed, based on the pilot round of interviews and be conducted from the middle of April 2024.

For the data collection, PIN and PAH will be using a combination of computer/tablet and paper. The KIIs will be recorded and transcribed if needed.

2. Focus Group Discussions (FGDs) with the communities (with community representatives)

PIN and PAH will conduct FGDs with community members (rural communities, camps in DRC/South Sudan) in order to understand the following:

- a. The issues community members face with regards to SWM;
- b. The traditional SWM methods;
- c. Actual SWM methods.

FGDs will be used, if needed, to triangulate some data received through KIIs or DO.

FGDs will be conducted by an experienced facilitator and a notetaker (both fluent in local language or working with an interpreter). The FGDs are conducted with a group with maximum 10 participants, representing the community (men, women, community health volunteers etc.).

3. Direct Observations (Dos) in the communities

Direct observation will be used in communities and camps in DRC and South Sudan. Through direct observation, PIN and PAH's assessment teams will be able to a) collect data on waste pathways; validate secondary data (e.g. on types of waste); and also verify information provided from KIIs. PIN and PAH will observe the waste (type, quality, quantity), as well as waste pathways (including SWM) in communities/camps. Waste management at important structures in the communities/camps will be observed (e.g. health facilities, schools). PIN and PAH teams will walk around communities/camps and take notes, photographs/video, make sketches and record GPS to document the observation findings. PIN and PAH will conduct both structured (e.g. whether the waste is re-used/recycled) and unstructured DO (e.g. waste pathways in communities/types of waste). Humanitarian distributions will be also observed, focusing on how the waste generated from them is used, where possible.

PIN has prepared a tailored-made assessment matrix, including the description of data collection methodology and sampling considering the standards in PIN's Manual for Monitoring, Evaluation, Accountability and Learning, other internal PIN MEAL resources, such as quality improvement and verification checklists (QUIVCs)



for FGDs and KIIs, as well as PIN Data Protection Policy. Moreover, KIIs and DO were designed based on the ACAP's "Direct Observation and Key Informant Interview Techniques for primary data collection during rapid assessments" and FGDs based on IFRC's Community engagement and accountability toolkit (Tool 16: FGD Guide). The analysis of data received through KIIs, DO and FGDs will be done in line with those as well.

The following ethical issues were considered:

- **Informed Consent:** to inform the informants about the research purpose, how the information they provided will be used and about their rights (incl. right to withdraw at any point);
- **Confidentiality and Anonymity:** to ensure both confidentiality of the provided information and anonymity of the respondent (if requested);
- **Cultural Sensitivity:** to ensure PIN/PAH employees who will be doing the interviews/observations/FGDs will be culturally sensitive and respectful of the informant's background and beliefs (including languages).

Based on those considerations, necessary documents (e.g. informed consent) will be signed with each respondent. The assessment matrix will be reviewed by the Ethics Board and adjusted as needed to comply with necessary ethical standards.

Bio4HUMAN will also differentiate the needs according to the diverse types of **locations** in DRC and South Sudan, such as:

- 1) **Smaller municipalities and communities/villages**, where waste management system is rarely managed by the authorities which leads to uncontrolled waste disposal techniques.
- 2) **Big cities** with limited waste management systems.
- 3) **Camps**, being the typical settlement type for humanitarian context, usually organised/semi-organised and managed by an NGO/UN agency together with local authorities (camps will be targeted in South Sudan as explained in the GA).

2.1.1 Information to be collected in Phase 1

In order to carry out phases 2, 3, and 4 of Bio4HUMAN scoping, phase 1 (T3.3) requires collecting information about solid waste identification, methods for SWM (including traditional methods), identification of humanitarian supply chains and its leaders, and identification of needs of the humanitarian sector with regards to SWM.

- a. Solid Waste Identification in DRC and South Sudan will focus on:
 - Type of waste (e.g. plastics, corrugated board, wood, mixed materials (laminated, composites), metals, others);
 - Approximate quantity¹ of wastes produced, data can be considered from shipments or if possible, from questionnaire in the locations;

¹ PIN and PAH have informed other Bio4HUMAN partners about the challenges that they might face in order to estimate the quantity. This has been also identified by WREC as one of the main challenges of humanitarian actors when it comes to data related to SWM (as described in the GA). Appropriate methodologies have been assessed and are part of the methodology

- Approximate quality of wastes, indicating e.g. possible contamination, or other material issues; whether the waste is harmful to the environment (emission and pollution to the air, soil, or water) or for human health;
 - Waste production (after its use, produced during delivery, and its location);
 - Information whether it is possible to limit SW and how to do it;
 - Periodicity of SW (how often it does appear e.g. permanently, cyclical);
 - Entities or persons in charge of waste;
 - Protection of waste to prevent non-intended management (by rotting, by severe weather conditions, taken over by others);
 - Infrastructure availability (storage place is hardened, illuminated, fenced, availability of electricity – power available, water, sewage system, emission, and pollution monitoring systems).
- b. Traditional / up-to-date methods of SWM (re-use, re-cycling, applied ecological loop to raw materials or usable products, e.g. fertilizers), including SW sorting, grading, or composting,
- c. Identification of humanitarian supply chains and their leaders.
- d. Identification of needs of the humanitarian sector in SWM – problems which so far are not solved by the current methods.

By the end of the first phase of scoping, Bio4HUMAN should give an answer to the following question: “*What are the needs of the humanitarian sector in terms of Solid waste management?*”

2.2 Phase 2: Assessing the scope for which bio-based innovative technological solutions and bio-based systems may have relevant applications under humanitarian contexts

In this phase, Bio4HUMAN will conduct an analysis on the possibilities offered by bio-based solutions to cover the needs identified in the first phase of the scoping exercise.

In this phase, bioeconomy processes, products and systems that could offer a suitable alternative for SWM in humanitarian applications will be identified. This information will be extracted from definitions and domains provided mainly by the European Union, the Organization for Economic Cooperation and Development and the Food and Agricultural Organization, and Biobased industries consortium, among others. Bio-based producers and bio-based/bio-economy actors will be considered as well.

matrix, but there is a high risk that it will not be possible to estimate the quantity of the waste produced by humanitarian actors.

Table 2. Initial list of materials for the second phase of the scoping exercise

| Biobased information sources |
|--|
| <p>The strategic, programming, and legislative documents of the EU:</p> <ol style="list-style-type: none"> 1. A sustainable bioeconomy for Europe. The updated Bioeconomy Strategy, 2. Common Agricultural Policy (CAP) 2021 - 2027, 3. A new Circular Economy Action Plan For a cleaner and more competitive Europe, 4. Waste Framework Directive (WFD)² – EU Directive 2008/98/EC & <i>Guidance on the interpretation of key provisions of Directive 2008/98/EC on waste</i> (with its Annex “The European List of Waste”) 5. The European Green Deal, 6. The Green Deal Industrial Plan. |
| <p>EU standards for selected bio-products,</p> <ol style="list-style-type: none"> 1. Standardisation for Bio-polymers and Bio-plastics CEN/TC 249, 2. Standardisation for Bio-based products (CENTC411), 3. Composting standards for packaging and products such as EN 13432 (packaging) and EN 14995 (plastics) |
| <p>The reports and publications resulting from the EU-funded projects on the bioeconomy.³</p> |
| <p>National documents (e.g., national bioeconomy strategies: Austria, Finland, France, Germany, Ireland, Italy, Latvia, the Netherlands, Spain, and Portugal; non-EU countries with the bioeconomy strategies include Great Britain and Norway</p> |
| <p>The recently published reports and analysis</p> <ol style="list-style-type: none"> 1. A competitive bioeconomy for sustainable future by CBE JU 2. Circular bioeconomy: The business opportunity contributing to a sustainable world by Boston Consulting Group |
| <p>The Climate and Environment Charter for Humanitarian Organisations</p> |

It should be clear **that the minimization of solid waste in a humanitarian context can be tackled in three ways**, that should be approached in this phase of the scoping exercise:

- 1) The implementation of **new bio-based materials production or packaging solutions** by the suppliers of the products.
- 2) The **use of bio-based technologies** and systems that ensure the natural biodegradation of residues or their easy disposal.
- 3) The **use of bio-based technologies, if accessible**, that offer the possibility of further **use by the local community**.

² sets the basic concepts and definitions related to waste management, such as definitions of waste, recycling, and recovery. It explains inter alia 1) what is to be considered as waste 2) when the waste becomes a secondary raw material 3) how to distinguish between waste and side-products.

³ The list of relevant EU-funded projects is under construction through T7.4 Synergies and collaborations with other relevant project and initiatives led by project partner HUB.

2.3 Phase 3: Identification of existing technological solutions, bio-based systems, and potential improvements to the supply chains – all being of potential value to the humanitarian aid sector

2.3.1 Analysis of technological solutions and bio-based systems

The purpose of this phase of the scoping exercise is to identify the already existing technological solutions that should respond to the needs and expectations of the humanitarian actors. The identifications will take the following forms:

- 1) **The survey conducted with the bio-based companies that are members of the Bio-based Industries Consortium (BIC).**⁴ The survey will include questions relating to the actual product portfolio, but also to the ongoing R & D & I activities of the companies. Additionally, this survey will serve as a communication tool for the industry, aiming to capture the interest of such bio-based companies.
- 2) The **analysis of the bio-products and bio-services** delivered through **projects** financed by the Circular Biobased Europe Joint Undertaking (CBE JU).
- 3) The **product information on the web pages** of national and international organisations advocating for the bioproduct and bio-services (e.g., databases by the InnProBio, BioPreferred by the USDA, the Plant Based Products Council, State of Green). Information will be divided into different groups, technologies, products, and packaging. These groups will be further divided into food and non-food applications, and results will be summarised in a matrix to evaluate their suitability to the final application.
- 4) The **awards given to the exceptional products** at the biggest trade fair events relating to the bio-economic issues (i.e., International Trade Fair for Water, Sewage, Waste and Raw Materials Management (IFAT), Plastics Recycling Show Europe in the Netherlands, International Trade Fair for Waste Management, Recycling, Environmental Technologies in South Korea, ECOMONDO The Green Technology Expo in Italy, Resource Waste Management trade show in UK, Pollutec, World Bio Markets, Africa Waste Management Summit, WasteCon in South Africa).
- 5) The **analysis of the formal applications** submitted to the European Union Intellectual Property Office (industrial designs) and to the European Patents Office (patents) through their online databases.

2.3.2 Supply chain gaps

2.3.2.1 Humanitarian Actions Logistics

Logistics is the backbone of humanitarian aid, representing 60 to 80% of expenditure and a major starting point for improving humanitarian operations cost effectiveness. **The ‘humanitarian supply chain’ is defined as:** “*The planning,*

⁴ Letter of Support for survey conduct has been provided by BIC.

procurement, storage, transport and delivery of different forms of supplies, works & services used for projects and to respond to emergencies. This includes the flow of supplies from origin to destination but also more complex work of forecasting, optimising resources, value for money to ensure the most efficient process, and decreasing the carbon footprint of related operations”⁵.

Three main areas have been identified: logistics flow or supply chain, operational logistics and support logistics.

Table 3 Humanitarian Actions logistics areas and its functions

| Humanitarian Actions logistics areas and its functions | | |
|--|------------------------------|---------------------------------|
| SUPPLY CHAIN LOGISTICS | OPERATIONAL LOGISTICS | SUPPORTING LOGISTICS |
| Identification of needs | Distribution | Infrastructure (municipal type) |
| Planning | Water (tanks or bottled) | Technical equipment |
| Procurement | Rehabilitation works | ICT |
| Custom clearance | Constr. of shelters or camps | Security |
| Transportation | Sanitation, hygiene | Transport vehicles for persons |
| Storage | Health and vaccination | Energy supply |
| Waste collection, cleaning up residues, waste sorting, grading, and valorisation | | |

2.3.2.2 Humanitarian Actions wastes production and management

Each of the presented above logistic area is responsible for specific to its functions production of side products and wastes. Waste legislation and policy of the EU shall apply as a priority order to develop solutions and technologies to meet the waste management hierarchy: 1) prevention 2) preparing for re-use 3) recycling 4) other recovery (e.g. energy) 5) disposal (e.g. landfill).

This logic shall also apply and constitute a key approach in the BIO4HUMAN Scoping. We will pay most attention to solutions and technologies aiming on preventing, reuse, recycling and transformation to raw materials (ecological loop) - to minimize the waste disposal (SWM approach).

The supply chain gaps in SWM will be identified based on the analysis of different links in the supply chain, the techniques used to manage the supply chains and the current techniques to manage the solid waste generated at each supply stage.

⁵ <https://plan-international.org/eu/blog/2022/12/13/supply-chain/>

The supply stages that will be analysed according to the Grant Agreement, are included in **Error! Reference source not found.**

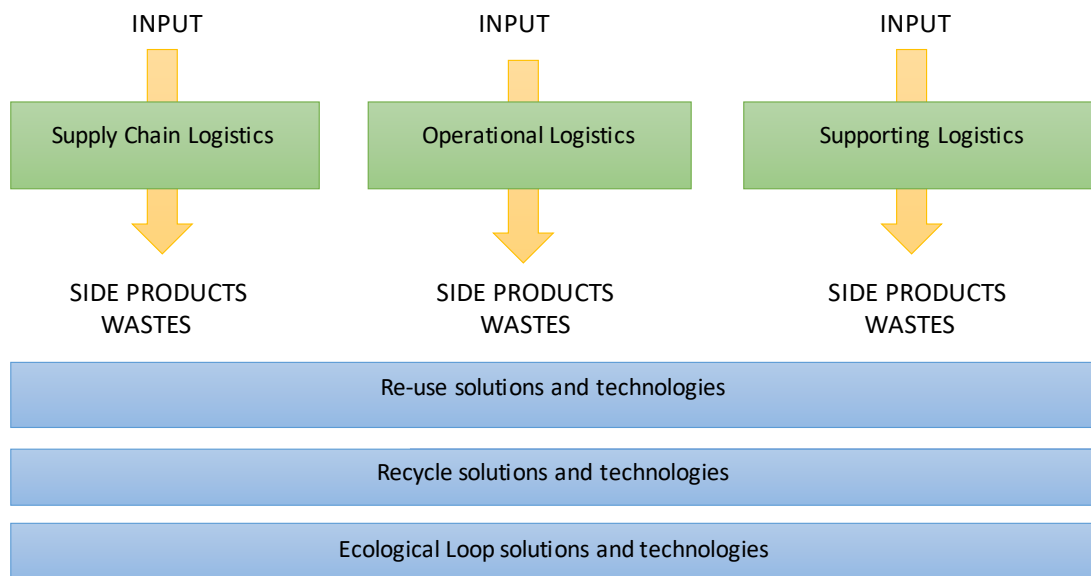


Figure 3: Humanitarian Actions logistics area: waste production and scoping for dedicated solutions and technologies

2.3.2.3 Identification of the supply chain gaps

The supply chain gaps in the SWM system for humanitarian action will be identified based on:

- 1) an analysis of the different links in the supply chains
- 2) the techniques used to manage the supply chains
- 3) the current techniques and technologies used to manage the solid waste that is generated at each supply stage.

The actual analysis of the supply chain gaps in the SWM system for humanitarian action will be conducted through the following forms:

1. EXPLORATORY PHASE

- review of literature on evolution on relevance of supply chain management in the humanitarian context
- interviews and discussions with humanitarian supply chains leaders
- data collection on SWM from humanitarian operations through multiply studies

2. INDUCTIVE PHASE

- analysis of SWM at supply chains stages
- gaining new insight into waste management to identify gaps for improvement
- provision of fact-based evidence to support SWM in humanitarian actions

A supply chain mapping will also be considered.

In this phase also the current SWM techniques and systems will be analysed for the following supply stages which have already been identified as of importance for the SWM occurring during the humanitarian actions:

- the sourcing/purchasing of products for the humanitarian action
- their collection in warehouses
- transport to the destination country (often multi-stage and using different modes of transport)
- transport to the final destinations
- storage at the final destinations
- distribution
- the clean-up of the residues after the action
- the in-situ reparation to be reused
- the capabilities of valorisation (home-compost or thermal processes) as fertilisers, energy, other
- increase the resilience of the soil against erosion or runoff by fixing plants using natural fertilisers and bio-based nets and other such solutions.

The techniques and systems will be analysed in the context of the potential use of bio-based components and their environmental and climate impacts.

2.4 Phase 4: The identified gaps

The purpose of this last phase of the scoping exercise is to identify where the gaps and the innovative approaches studied in phases 2 and 3 may lie. This scoping phase will start with definition of dimensions and point scales that will be devised and agreed specifically for this exercise. After that, a common data sheet (containing characteristics of gaps study such as methods, participants, outcomes) and simple rating scheme with predefined dimensions and point scales will be agreed. The base for the rating scheme will be created by the humanitarian sector priority areas that will be defined in T3.3 (phase 1 of the scoping). T3.3 will therefore plan its work to secure knowledge transfer to Phase 4 of the scoping. T3.3 and T4.3 leaders will secure this synchronisation. The results of the gaps identification will be translated into a gaps analysis that will take upon a form of a report (D4.2 due in M15).

3. Methods for data collection and analysis

For the data collection and analysis, the partners involved in scoping tasks will collect both primary and secondary data. While the secondary data will be collected from a literature review (including grey literature), as described in 2.1; the primary data collection in DRC and South Sudan will primarily consist of:

- a. Key informant interviews (KIIs)
- b. Direct observation (DO)
- c. Focus Groups Discussions (FGDs)

The primary data collection will be conducted in DRC and South Sudan in different locations: cities, rural communities and in camps and the methods of this data collection are in depth depicted in Chapter 2.1 of this deliverable.

3.1 Data analysis

The data collected from the different phases of the scoping plan will be qualitative or quantitative (no. of waste, no. of distributed items, no. of beneficiaries). Data collected through KIIs, FGDs and DO from DRC and South Sudan will be analysed by PIN and PAH teams. No personal data will be shared with others and the information provided will be analysed anonymously and used confidentially.

In Bio4HUMAN, the collected quantitative data will be analysed either in Excel or SSPS. The data will be manipulated to generate tables and graphs to summarize data. Statistical techniques like common descriptive statistics such as averages and frequencies will be generated.

Data collected qualitatively will be analyzed through a content analytic approach, Excel, or software (e.g. ATLAS.ti), where themes will be constructed, and data will be grouped or coded into meaningful categories to easily analyze them. Triangulation, which is the use of multiple research strategies in a single research project, by location/data collection method/stakeholder, can be used to ensure validity of the information collected. After coding the data, the coded data will be observed for emerging themes and patterns shall be used to explain or discuss the findings that are obtained through surveys.

4. Timeline of the scoping plan

A Scoping plan has been proposed for WP3, WP4, and WP5, and a version of this plan was generated as an Excel file uploaded to the project SharePoint folder. These tasks are divided into tables, which are presented below for each WP. The first activities of the scoping are starting in T3.3 (M4). Each of four phases of the scoping exercise will start with the revision of this initial scoping plan to accommodate findings of the preceding phase.

Table 4. WP3 tasks and proposed effort

| start month | Addition | end month | TASK DESCRIPTION | TASK TYPE | PRIORITY | OUTPUT | % completed | STATUS LOG | DELIVERABLE | Due date | COMMENTS |
|-------------|----------|-----------|--|----------------------|----------|--------------|-------------|------------|-------------|----------|----------|
| 1 | 2 | 3 | 3.1 Mapping the key stakeholders | Compile information | | Contact list | | | | | |
| 1 | 2 | 3 | 3.1 Review of literature | Analyze information | | | | | | | |
| 1 | 2 | 3 | 3.1 Deliverable, stakeholder analysis | | | Deliverable | | | D3,1 | mar-24 | |
| 2 | 1 | 3 | 3.2 Development of the scoping plan | Compile information | | Guideline | | | | | |
| 2 | 1 | 3 | 3.2 Timeline | | | | | | | | |
| 2 | 1 | 3 | 3.2 Method for data collection | Compile information | | Guideline | | | | | |
| 2 | 1 | 3 | 3.2 revision | Validate information | | Report | | | | | |
| 2 | 1 | 3 | 3.2 Deliverable | Analyze information | | Deliverable | | | D3,2 | mar-24 | |
| 4 | 3 | 7 | 3.3 Phase 1. Scoping exercise | | | | | | | | |
| 4 | 3 | 7 | 3.3 Search strategy for literature review | Organize information | | Procedure | | | | may-24 | |
| 4 | 3 | 7 | 3.3 Literature review | Analyze information | | Report | | | | june-24 | |
| 4 | 3 | 7 | 3.3 Data field analysis (PIN/PAH) from community members and local authorities | Compile information | | Report | | | | may-24 | |
| 4 | 3 | 7 | 3.3 Data gathering from government institution, non-government agencies, civil organisations | Compile information | | Report | | | | june-24 | |
| 4 | 3 | 7 | 3.3 Deliverable | Analyze information | | Deliverable | | | D3,3 | jul-24 | |

| DESCRIPTION | Enspire | ITENE | UC | PRO CIVIS | PIN | WeLoop | IBF | PAH | AIMPLAS | HUB |
|--|---------|-------|-----|-----------|-----|--------|-----|-----|---------|-----|
| Mapping the key stakeholders | | | | | 0,7 | | 2 | 1 | | |
| Review of literature | | | 1,2 | | 0,3 | | 1 | | | |
| Deliverable, stakeholder analysis | | | 0,5 | | 1 | | 1 | | | |
| | | | 1,7 | | 2 | | 4 | 1 | | |
| Development of the scoping plan | | | | | | | | | | |
| Timeline | | 0,5 | | | | | | | | |
| Method for data collection | | 0,6 | | | | | | | | 0,2 |
| revision | | 0,3 | 0,2 | 0,3 | 0,3 | | | 0,3 | 0,2 | 0,3 |
| Deliverable | | 0,3 | | | | | | | | |
| | | 1,7 | 0,2 | 0,3 | 0,3 | | 1 | 0,3 | 0,2 | 0,5 |
| Phase 1. Scoping exercise | | | | | | | | | | |
| Search strategy for literature review | | 0,1 | 0,1 | | 0,6 | | 0,4 | 0,3 | 0,2 | 0,1 |
| Literature review | | 0,1 | 0,1 | | 1 | | 0,2 | 0,4 | 0,1 | 0,1 |
| Data field analysis (PIN/PAH) from community members and local authorities | | | | | 1 | | | 0,7 | | |
| Data gathering from government institution, non-government agencies, civil organisations | | 0,1 | | | 0,5 | | 0,3 | 0,2 | | |
| Deliverable | | | | | 0,9 | | | | | |
| | | 0,3 | 0,2 | 0,7 | 4 | | 0,9 | 1,6 | 0,3 | 0,2 |



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Table 5. WP4 tasks and proposed effort.

| start month | Addition | end month | TASK DESCRIPTION | TASK TYPE | PRIORITY | OUTPUT | % completed | STATUS LOG | DELIVERABLE | Due date | COMMENTS |
|-------------|----------|-----------|--|-----------------------------|----------|-----------|-------------|------------|-------------|------------|--|
| 7 | 1 | 8 | 4.1 Setting the scope of potential bio-based innovative technological solutions and bio-based systems | | | Procedure | | | | | |
| 7 | 1 | 8 | 4.1 Identification and analysis of the main relevant documents on bioeconomy: | | | | | | | 31.07.2024 | |
| 7 | 1 | 8 | Investigation line i) strategical, programming and legislative documents of the EU | Compile/analyze information | | Report | | | | | |
| 7 | 1 | 8 | Investigation line ii) EU standards for selected bio-products | Compile/analyze information | | Report | | | | | |
| 7 | 1 | 8 | Investigation line iii) reports and publications resulting from the EU funded projects on the bioeconomy | Compile/analyze information | | Report | | | | | |
| 7 | 1 | 8 | Investigation line iv) national documents on the bioeconomy | Compile/analyze information | | Report | | | | | |
| 7 | 1 | 8 | Investigation line v) recently published reports and analysis on the bioeconomy | Compile/analyze information | | Report | | | | | |
| 7 | 1 | 8 | Investigation line v) Climate and Environment Charter for Humanitarian Organisations | Compile/analyze information | | Report | | | | | |
| 7 | 1 | 8 | 4.1 Delivering the definitions and scopes of bioeconomy processes, bioeconomy products, bioeconomy systems, incl. the schemes of value chains for the bio-based solutions | Validate information | | | | | | 31.07.2024 | |
| 7 | 1 | 8 | 4.1 Summarizing material, providing for an important introduction into the next phase. | Analyze information | | | | | | 31.08.2024 | the summarizing material does not constitute the Deliverable of the Project, but provides for an important introduction into the next phases |
| | | | | | | | | | | | |
| 9 | 6 | 15 | 4.2 Identification of the technological solutions and bio - based systems | | | | | | | | |
| 9 | 5 | 14 | 4.2.1 Investigation line i) Survey conducted with all the bio-based companies members of the Bio-based Industry Consortium | Compile/analyze information | | Report | | | | 31.12.2024 | |
| 9 | 5 | 14 | 4.2.1 Investigation line ii) An analysis of the bio – products and bio – services delivered through projects financed by the Circular Biobased Europe Joint Undertaking | Compile/analyze information | | Report | | | | 31.12.2024 | |
| 9 | 5 | 14 | 4.2.1 Investigation line iii) Gathering and analysing product information on the web pages of national and international organisations advocating for the bio-product and bio-services | Compile/analyze information | | Report | | | | 31.12.2024 | |
| 9 | 5 | 14 | 4.2.1 Investigation line iv) Gathering and selecting the awards given to the exceptional products at the biggest trade fair events relating to the bio-economic issues | Compile/analyze information | | Report | | | | 31.12.2024 | |
| 9 | 5 | 14 | 4.2.1 Investigation line v) The analysis of the formal applications submitted to the European Union Intellectual Property Office (industrial designs) and to the European Patents Office | Compile/analyze information | | Report | | | | 31.12.2024 | |
| 9 | 5 | 14 | 4.2.1 List of Bio - Based Solutions | Analyze information | | | | | | 28.02.2025 | the formal deliverable of the Project |
| | | | | | | | | | | | |
| 9 | 6 | 15 | 4.2.2 Identification of supply chains gaps in SWM system for humanitarian action | | | | | | | | |
| 9 | 6 | 15 | 4.2.2 Investigation line i) Reviewing the literature on evolution on relevance of supply chain management in the humanitarian context | 0 | | Report | | | | 31.01.2025 | |
| 9 | 6 | 15 | 4.2.2 Investigation line ii) Interviewing / discussing with humanitarian supply chains leaders | 0 | | Report | | | | 31.01.2025 | |
| 9 | 6 | 15 | 4.2.2 Investigation line iii) Collecting the data on SWM from humanitarian operations through multiply studies | 0 | | Report | | | | 31.01.2025 | |
| | | | | | | | | | | | |
| 13 | 2 | 15 | 4.3 Gaps identification | | | | | | | | |
| 13 | 2 | 15 | 4.3 Definition of dimensions and point scales that will be devised and agreed specifically for this exercise | Organize information | | | | | | 31.01.2025 | |
| 13 | 2 | 15 | 4.3 Common data extraction sheet and simple rating scheme, for gap analysis report | Validate information | | | | | | 28.02.2025 | |
| 13 | 2 | 15 | 4.3 Translating the results of the task into a gap analysis report. | | | | | | | | |
| 13 | 2 | 15 | 4.3 Gap Analysis Report (the formal deliverable of the Project, comprising the results of 4.2.2. and 4.3.) | Analyze information | | | | | | 31.03.2025 | the formal deliverable of the Project, comprising the results of 4.2.2. and 4.3. |

| TASK | DESCRIPTION | Enspire | ITENE | UC | PRO CIVIS | PIN | WeLoop | IBF | PAH | AIMPLAS | HUB |
|-------|--|---------|-------|------|-----------|------|--------|------|------|---------|------|
| 4.1 | Setting the scope of potential bio-based innovative technological solutions and bio-based systems | | | | | | | | | | |
| 4.1 | Identification and analysis of the main relevant documents on bioeconomy: | | | | | | | | | | |
| | Investigation line i) strategical, programming and legislative documents of the EU | | | | 0,25 | | | 0,25 | | | |
| | Investigation line ii) EU standards for selected bio-products | | 0,25 | | | | | | | 0,25 | |
| | Investigation line iii) reports and publications resulting from the EU funded projects on the bioeconomy | | 0,25 | | | | | 0,25 | | | |
| | Investigation line iv) national documents on the bioeconomy | | 0,25 | | | | | 0,25 | | | |
| | Investigation line v) recently published reports and analysis on the bioeconomy | | | | 0,25 | | | | | | |
| | Investigation line vi) Climate and Environment Charter for Humanitarian Organisations | | | | | | | | | 0,25 | |
| 4.1 | Delivering the definitions and scopes of bioeconomy processes, bioeconomy products, bioeconomy systems, incl. the schemes of value chains for the bio-based solutions | | | | | | | | | | |
| 4.1 | Summarizing material, providing for an important introduction into the next phase. | | | | 1,25 | | | | | | |
| | | 0,00 | 0,75 | 0,00 | 1,75 | 0,00 | 0,00 | 0,75 | 0,00 | 0,50 | 0,00 |
| 4.2 | Identification of the technological solutions and bio - based systems | | | | | | | | | | |
| 4.2.1 | Investigation line i) Survey conducted with all the bio-based companies members of the Bio-based industry Consortium | | 5,00 | 0,25 | 0,25 | | | 0,25 | | 0,25 | |
| 4.2.1 | Investigation line ii) An analysis of the bio – products and bio – services delivered through projects financed by the Circular Biobased Europe Joint Undertaking | | 0,25 | 0,25 | 0,25 | | | 0,25 | | 3,50 | |
| 4.2.1 | Investigation line iii) Gathering and analysing product information on the web pages of national and international organisations advocating for the bio-product and bio-services | | 0,25 | | 0,25 | | | 1,50 | | 0,25 | |
| 4.2.1 | Investigation line iv) Gathering and selecting the awards given to the exceptional products at the biggest trade fair events relating to the bio-economic issues | | 0,25 | | 1,00 | | | | | 0,25 | |
| 4.2.1 | Investigation line v) The analysis of the formal applications submitted to the European Union Intellectual Property Office (industrial designs) and to the European Patents Office | | 2,00 | | 0,25 | | | 0,25 | | | |
| 4.2.1 | List of Bio - Based Solutions | | | | 1,25 | | 0,50 | | | | |
| | | 0,00 | 7,75 | 0,50 | 3,25 | 0,00 | 0,50 | 2,25 | 0,00 | 4,25 | 0,00 |
| 4.2.2 | Identification of supply chains gaps in SWM system for humanitarian action | | | | | | | | | | |
| 4.2.2 | Investigation line i) Reviewing the literature on evolution on relevance of supply chain management in the humanitarian context | | 3,50 | 0,25 | 0,25 | 0,50 | | 0,25 | 0,25 | 0,25 | |
| 4.2.2 | Investigation line ii) Interviewing / discussing with humanitarian supply chains leaders | | 0,25 | 0,25 | 0,25 | 0,50 | | 0,25 | 0,25 | 2,25 | |
| 4.2.2 | Investigation line iii) Collecting the data on SWM from humanitarian operations through multiply studies | | 0,25 | 0,25 | 0,25 | 0,50 | | 2,00 | 0,25 | 0,25 | |
| | | 0,00 | 4,00 | 0,75 | 0,75 | 1,50 | 0,00 | 2,50 | 0,75 | 2,75 | 0,00 |
| 4.3 | Gaps identification | | | | | | | | | | |
| 4.3 | Definition of dimensions and point scales that will be devised and agreed specifically for this exercise | | 0,25 | 1,25 | 0,25 | 0,50 | 0,25 | 0,25 | 0,25 | 0,25 | |
| 4.3 | Common data extraction sheet and simple rating scheme, for gap analysis report | | 0,25 | 0,30 | 0,25 | 0,50 | 0,25 | 0,25 | 1,00 | 0,25 | |
| 4.3 | Translating the results of the task into a gap analysis report. | | | | 0,50 | 2,00 | | | | | |
| 4.3 | Gap Analysis Report (the formal deliverable of the Project, comprising the results of 4.2.2. and 4.3.) | | | | 1,25 | | | | | | |

Table 6.WP5 tasks and proposed effort

| start month | Addition | end month | TASK DESCRIPTION | TASK TYPE | PRIORITY | OUTPUT | % completed | STATUS LOG | DELIVERABLE | Due date | COMMENTS |
|-------------|----------|-----------|---|-----------------------------|----------|-------------|-------------|------------|-------------|----------|----------|
| 12 | 6 | 18 | 5.1 Data collection for pulp and paper and agricultural waste management | Compile information | | Report | | | | may-25 | |
| 12 | 6 | 18 | 5.1 Deliverable | Analyze information | | Deliverable | | | D5,1 | jun-25 | |
| 15 | 7 | 22 | 5.2 Hotspots analysis of the current and innovative solutions | | | | | | | | |
| 15 | 7 | 22 | 5.2 Analysis of data from T5.1 | Analyze information | | Report | | | | may-25 | |
| 15 | 7 | 22 | 5.2 Determination of the hotspots of the current and innovative bio-based waste management solutions. | Compile/analyze information | | Report | | | | sep-25 | |
| 15 | 7 | 22 | 5.2 Deliverable | Analyze information | | Deliverable | | | D5,2 | oct-25 | |
| 21 | 3 | 24 | 5.3 Identification of the best available innovative solutions based on environmental LCA | | | | | | | | |
| 21 | 3 | 24 | 5.3 Identification of best available innovative solutions for policymakers | Compile/analyze information | | | | | | oc-25 | |
| 21 | 3 | 24 | 5.3 Provide solutions considered nowadays but have not yet been implemented | Analyze information | | | | | | nov-25 | |
| 21 | 3 | 24 | 5.3 Deliverable | Analyze information | | | | | D5,3 | dic-25 | |

5. Communication of the results

The Communication of results of the scoping exercise plays an essential role both in the exercise per se, but also for Bio4HUMAN, as it sets the foundation for a clear understanding and alignment among all stakeholders involved in the design, development, and implementation of the identified solutions. By effectively conveying the scoping results, the consortium can ensure a shared vision, and communicate expectations to key stakeholders (identified in D3.1). Moreover, transparent communication of these results helps to manage stakeholders' expectations, mitigate misunderstandings, and foster a culture of trust and collaboration during the project as well as long-term. This is especially important in large-scale multi-actor projects where the scope can significantly influence timelines, costs, and the overall implementation success of the solutions across humanitarian settings.

Various communication activities and channels will be strategically utilized to ensure that the results of the scoping exercise are effectively communicated to stakeholders, catering to their diverse spectrum of needs and preferences. While preparing this deliverable, the following list of activities has been identified and will be subject to changes based on the feedback and monitoring of the stakeholder interactions but also the communication of the project as follows.

- **Stakeholder Presentations:** Tailored presentations (online or on-site) will provide an overview or deep dive into the scoping results, allowing for real-time feedback and Q&A sessions. The organization of the presentations will be offered to stakeholders after the end of each phase of the scoping exercise. The presentations will be organized once a critical mass is gathered and will be archived on the project website.
- **Thematic Workshops:** These workshops will aim to encourage active participation and discussion among stakeholders, helping to clarify any uncertainties related to the scoping of solutions. A specific series of thematic workshops for humanitarian sector actors will be organized with an aim to include them in the co-development of scoping results.
- **Policy brief:** This written document will serve as a reference, offering comprehensive details about the scoping exercise outcomes presented as evidence-based and high-quality information that can be used to create new or adjust existing SWM policies in humanitarian settings.
- **Infographics and Visual Summaries:** For stakeholders who may be overwhelmed by detailed reports, visual summaries will be prepared to highlight key points and findings in an accessible and engaging manner.

To ensure an effective communication strategy, communication of the scoping results will be included and aligned with the project's Dissemination, communication and exploitation plan delivered by M6. The following key communication channels will be used for communication and dissemination of results:

- **Project Web Page:** Providing a central place for all scoping-related information ensures that stakeholders have access to the latest updates and



resources at their convenience. The results of the different phases of the scoping exercise will have its dedicated resource page on project website. This is to ensure the open access of the publications and data gathered during the exercise. Furthermore, the dedicated website discussion forum (handled via LinkedIn discussion forum plug-in) will be the additional part of the website where the results will be communicated and discussed.

- **Project social media** – Project social media will vastly promote and inform on scoping results. They will allow reaching out directly to key stakeholders and increase the audience base throughout the scoping phases.
- **Multiplier platforms** – Scoping results will be uploaded on relevant EU platforms.
 - **For circular economy professionals**, platforms such as: a. European Circular Economy Stakeholder Platform Knowledge Hub b. Circular Cities and Regions Initiative support materials c. Circle Economy Knowledge Hub
 - **For humanitarian sector professionals**, platforms such as: a. European Civil Protection and Humanitarian Aid Operations (ECHO) b. ReliefWeb c. Humanitarian Data Exchange (when identified as relevant) d. Network for Humanitarian Action (NOHA)
 - **For bio-based sector professionals**, platforms such as: a. Bio-based Industries Consortium (BIC) b. Biobased Europe c. The European Bioeconomy Network d. Circular Biobased Europe Joint Undertaking

Additionally, the project will aim to leverage an additional mix of general project dissemination and communication activities, networks and channels that will be in detail presented in the Dissemination, communication and exploitation plan delivered in M6. These will constitute another means of communication enabling to cover the diverse preferences and needs of Bio4HUMAN stakeholders. All communication activities related to the communication and dissemination of the scoping results will be dully monitored, and adjustments in their communication and dissemination strategy will be made by the WP7&8 leader (Enspire), if the monitoring results showcase this need (e.g. low interest of stakeholders, misunderstandings, disagreements).

6. Risks and limitations and ways to mitigate them

When collecting information related to humanitarian context, the risk and mitigation measures that have been identified are indicated in Table 7.

Table 7. Risks and mitigation measures

| Risk | Mitigation measures |
|--|---|
| Lack of /limited access to information/locations | Working closely with OCHA and its Access Unit, and other humanitarian partners, to access targeted locations. For volatile areas, PAH gathers all necessary security information both from OCHA and partners on the ground before deciding to send staff. A contingency plan (provisional hire of a charter for evacuation of staff) is always put in place for volatile context. |

| | |
|--|---|
| Security issues | Monitoring the security situation in all the areas of activities, updating the context in areas of activities, and making reassessments and changes if needed, including rising violence in the towns and villages where PAH staff conducts activities; |
| Unwillingness of the stakeholders to participate in the interviews or FDGs | The involvement of local authorities and communities in implementing the intervention plan. Maintaining a close relationship with local communities, as well as informing local authorities and other stakeholders about our activities enhances the organisation's acceptance by communities and local authorities, and allows the teams to perform their duties in a relatively safe environment in the field. Ensuring all community members, stakeholders (including authorities) are clear about the purpose of the activities. Coordinating the NGOs discussions with support of Clusters and UN coordination structures. |
| Limited information identified on supply chain | Partners will involve suppliers that have longer cooperation with to ensure their involvement and reliability. Additional information will be cross referenced to ensure reliability. |
| Unreliable information provided by the stakeholders | Verification of information from interviews and FDGs will be done through additional observations. |

7. Conclusions

In summary, the Bio4HUMAN scoping plan plays a crucial role in ensuring the success and effectiveness of the scoping exercise within Bio4HUMAN. By providing a clear and comprehensive overview of the objectives, methods, timeline and communication of the scoping results, this deliverable in a form of a report serves as a guiding framework for the identification of the bio-based solutions for SWM in humanitarian actions. This deliverable also introduced potential risks and limitations when it comes to scoping part of the project and mitigation measures how to avoid them and successfully achieve the goals of the project related to scoping. Workplan has been proposed and tentative efforts have been assigned to each partner according to their foreseen participation.