BETTER Life

Project acronym: BETTER Life

Title: Bringing Excellence to Transformative Socially Engaged Research in Life Sciences through Integrated Digital Centers

Project number: 101071314

Deliverable 3.1

Standards for Socially Engaged Research in Life Sciences

Description: The standards should be used when designing the tools supporting to conduct of socially engaged research in life sciences: the tools should align with the standards to assure they will be used in an appropriate way.

Lead party for deliverable: ACEEU

Document type: Report (R)

Due date of deliverable: 30. 06. 2023

Dissemination level: PU

Authors: Hugo Buitrago, Adekola Ashonibare, Arjan de Groot, Michal Lošťák, Patrik Toula

Funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

BETTER Life PARTNERS:

CESKA ZEMEDELSKA UNIVERZITA V PRAZE (CZU)
PIC 999912570, established in KAMYCKA 129 SUCHDOL, PRAHA 165 00, Czechia

MARTIN-LUTHER-UNIVERSITÄT HALLE-WITTENBERG
PIC 999871539, established in UNIVERSITÄTSPLATZ 10, HALLE 06108, Germany

UNIVERSITA DEGLI STUDI DI CAMERINO (UNICAM)
PIC 999845737, established in PIAZZA CAVOUR 19F, CAMERINO 62032, Italy

ACEEU GMBH (ACEEU)
PIC 896865008, established in WILHELM-SCHICKARD-STR 14, 48149, MÜNSTER, Germany

EESTI MAAULIKOOL (EMU)
PIC 999857280, established in KREUTZWALDI 1, TARTU 51014, Estonia

DAUGAVPILS UNIVERSITATE (DU)
PIC 999830702, established in VIENIBAS STREET 13, DAUGAVPILS 5401, Latvia

UNIWERSYTET PRZYRODNICZY W POZNANIU (PULS)
PIC 999880463, established in ULICA WOJSKA POLSKIEGO 28, POZNAN 60 637, Poland

HELIXCONNECT EUROPE SRL (HELIXCONNECT)
PIC 893409868, established in 282A CAMERA 1, BUCOVAT 307352, Romania

UNIVERZITET EDUCONS U SREMSKOJ KAMENICI PRIVATNE USTANOVE (EDUCONS)
PIC 973147263, established in VOJVODE PUTNIKA 87, SREMSKA KAMENICA 21208, Serbia

Funded by the European Union

Deliverable Information	
Title	Standards for Socially Engaged Research in Life Sciences
Deliverable number	3.1
WP number	3
Lead beneficiary	ACEEU
Author(s)	Hugo, Buitrago, Adekola Ashonibare, Arjan de Groot, Michal Lošťák, Patrik Toula
Type	R
Dissemination Level	PU
Delivery date	30. 06. 2023

Project information	
Title	Bringing Excellence to Transformative Socially Engaged Research in Life Sciences through Integrated Digital Centers
Acronym	BETTER Life
Project no.	101071314
Type of Action	HORIZON Coordination and Support Actions
Website	www.betterlifehorizon.eu

History of Changes

Version	Date	Comment	Revised by
Version 0.1	30. 04. 2023	First draft	Hugo, Buitrago, Adekola Ashonibare
Version 0.2	15. 05. 2023	Second draft	Hugo, Buitrago, Adekola Ashonibare
Version 0.3	23. 05. 2023	Third draft	Gordana Racic, Victoria Takacs
Version 0.4	14. 06. 2023	Fourth draft	Hugo, Buitrago, Adekola Ashonibare
Version 0.5	21. 06. 2023	Fifth draft	Arjan de Groot, Sussane Winge
Version 1.0	30. 06. 2023	Final version	Arjan de Groot, Michal Lošťák, Patrik Toula, Hugo Buitrago

TABLE OF CONTENTS

1. INTRODUCTION 5

1.1 The BETTER Life Project 6

1.2 Key Definitions 7

1.3 Overview of Existing Frameworks and Standards on Socially Engaged Research 9

1.4 Purpose of the Standards for SER in Life Sciences 11

1.5 Overview of the Framework for SER in Life Sciences 13

1.6 Standard Development 15

2. OVERVIEW AND STRUCTURE OF THE STANDARDS 16

2.1 Standards for Socially Engaged Research in Life Sciences 17

Sub-dimension 1.1 Support Structures 18

Sub-dimension 1.2 Research Capacities 19

Sub-dimension 1.3 Contextual Knowledge 20

Sub-dimension 2.1 Involvement of Societal Stakeholders 21

Sub-dimension 2.2 Networking and Collaboration 22

Sub-dimension 2.3 Shared Power 23

Sub-dimension 3.1 Contextual Relevance 25

Sub-dimension 3.2 Scientific Relevance 25

Sub-dimension 3.3 Quality Assurance Measures 26

Sub-dimension 4.1 Instrumental Benefits 27

Sub-dimension 4.2 Conceptual Outcomes 28

Sub-dimension 4.3 Enhanced Local Capacities 29

3. CONCLUSIONS 30

REFERENCES 31

1. INTRODUCTION

This report aims at introducing and explaining the standards that will guide the implementation of socially engaged research in life sciences on an interinstitutional level. The report builds on the framework for SER in LS in the BETTER Life project. It sets the scene for developing evidence of the standards (toolkits), which will be developed at the later stage as following deliverable *D3.2 BETTER Life Toolkits.*

These standards aim at serving as a barometer to assess, measure and recommend actionable "items" for SER in LS. This report is organised in two sections. The first section presents background information, including key concept definitions, while also discussing the purpose of the standards and the methodology used for their development. Additionally, it provides an overview of the framework for socially engaged research in life sciences, which served as the foundation for developing the standards. The second section presents an overview of the standards, providing background information about their structure and guidelines for implementation.

Furthermore, it includes a set of indicators to determine how these standards can be met. The standards outlined in this report will be further developed and operationalised into the tools the project will create. These toolkits will serve as practical resources and transform the standards into adaptable resources, aiming at fostering SER in life sciences.

One of the pressing issues we aim to address through the development of these standards is the lack of a comprehensive and standardised approach to socially engaged research. During our consultations, we discovered that communication issues and the absence of a general framework were significant challenges hindering the effective implementation of SER in life sciences. By establishing these standards, we intend, among the others, to provide guidance and address these issues by promoting consistent practices and facilitating better communication among stakeholders.

To ensure the quality and effectiveness of the toolkits, it is crucial to consolidate the tools and activities into a cohesive framework. By developing these standards, we aim to guarantee the integrity and value of the toolkits that will be created as a major output of the project. These toolkits will serve as practical resources, offering tangible support to researchers, institutions, and other stakeholders involved in SER in life sciences. With the toolkits, we envision empowering end users to apply the standards in a way that suits their specific needs and contexts.

1.1 The BETTER Life Project

BETTER Life "Bringing Excellence to Transformative Engaged Research in Life Sciences through Integrated Digital Centres" is a project funded by the European Commission under the Horizon Europe (Widening Participation and Spreading Excellence) Programme. BETTER Life is based on the quadruple helix model of innovation, where the interaction of academics, research, industry, government, and civil society generate mutually beneficial partnerships. The specific objectives of the project are to:

- consolidate a strategic vision for the BETTER Life DCoE oriented to stand as a world reference in SER in LS and committed to long-term sustainability;
- build intra- and inter-institutional capacities to foster SER in LS through resources, guidelines, network cooperation, and policy designs at regional and international levels;
- build individual capacities for boosting the social impact of the research developed by early career researchers by providing support to design, develop, and valorise research engaged with the surrounding ecosystems;
- consolidate the BETTER Life DCoE as a global reference point in developing and pioneering transferable tools to foster SER in LS at individual, institutional, regional, and international levels.

In addition to these objectives, the BETTER Life project also aims to assist ECRs in designing and conducting research in collaboration with and between Quadruple Helix actors. This aspect emphasises the importance of involving ECRs in meaningful engagement with academia, industry, government, and civil society to enhance the impact of their research. By supporting ECRs in navigating and leveraging the Quadruple Helix model and equipping them with the necessary tools and guidance, the project seeks to empower them to create research that aligns with real-world needs, contributes to community involvement in research, and ensures that the research initiatives have a tangible impact on addressing pressing challenges.

In the long term, the project will generate scientific impacts by designing transferable policies and tools, economic impacts by effectively attracting funding, and societal impacts by embedding local ecosystem needs and enhancing the real-life impact of academic institutions.

1.2 Key Definitions

Ecosystem: Being a consortium comprising numerous life sciences universities, we recognise the conventional definition of the term "ecosystem" as referring to "all the living things in an area and the way they affect each other and the environment," as defined by the Cambridge dictionary. However, for the project and its socially engaged research content, we employ a broader interpretation of the term aligned with the concept of a complex network or interconnected system, adhering to established standards.

Framework: A framework refers in the understanding of this project to a set of formal structures necessary for service provision and fostering the development of a specific topic. It envisions consistency in the conception, implementation, evaluation and follow-up of strategies. Such a framework is the precondition for the implementation and management of intervention tools. A framework shapes the scope and efficacy of interventions (Garrett & Moarif, 2018) and is composed of sub-dimensions that constitute the building blocks of a

policy or institution. Under each dimension, there are standards and indicators that act as the specific goals reflecting a general strategy. The framework for SER in Life Sciences developed in the project focuses on the key aspects that need to be fostered for the advancement of SER in LS.

Life Sciences: The study of living organisms and ecosystems (micro-organisms, plants, and human beings), which has applications in health, agriculture, medicine, biotechnology, environmental protection, pharmacy, and food, among others.

Socially Engaged Research: The BETTER Life Project understands SER as a strategic approach to the definition, planning, management, and execution of a research agenda in which there are meaningful interactions between diverse societal stakeholders. SER engages higher education institutions, local communities, governments, SMEs, and organisations for the development of mutually beneficial relationships. SER is undertaken in collaboration with community partners, as opposed to being conducted for or about them. SER brings together the stakeholders framed in the quadruple helix model of research and innovation, namely academia, industry, government and civil society. The interaction and collaboration among these stakeholders allow for the inclusion of non-traditional research paths related to non-technological and technological improvements, service creation, social entrepreneurship, and creativity exploitation (Carayannis & Campbell, 2009; European Committee of the Regions, Volpe, M., Friedl, J., Cavallini, S., et al. (2016)). The aim of SER is to address relevant societal challenges to increase the accountability, responsibility, contributions, quality, relevance, and positive impact of research on society at the regional, national, and international levels.

Standard: a standard refers to a set of guidelines, criteria, or specifications that are widely accepted and recognised as a benchmark of quality, consistency, safety or performance. From a multisectoral standpoint, the International Organisation for Standardisation offers a comprehensive definition of standards as a document that provides requirements, specifications, guidelines or characteristics that can be used consistently to ensure that materials, processes and services fit for their purpose (ISO, 2004). Looking at it from the

technical perspective, the European Committee for Standardization and the European Committee for Electrotechnical Standardization (CEN-CENELEC) define a standard as "a technical document designed to be used as a rule, guideline or definition. It is a consensus-built, repeatable way of doing something" (CEN-CENELEC, 2021). For this report, the BETTER Life Consortium defines 'standard' as a set of requirements and guidelines for conducting socially engaged research in life sciences.

1.3 Overview of Existing Frameworks and Standards on Socially Engaged Research

In developing the standards for SER, the consortium participating in the BETTER Life Project draws upon various frameworks and standards on engaged research. The Status Quo Report in SER extensively discusses the existing frameworks and theoretical context of engaged research.

From the standpoint of research processes and the opportunities for involving diverse stakeholders, the framework for engaged research developed by CampusEngage (Bowman et al., 2018) and the National Coordinating Centre for Public Engagement (NCCP, 2020) highlighted the key stages of a research project and the strategies to be implemented before, during, and after the research project to engage stakeholders. This approach ensures the relevance of research and its impact. However, this perspective primarily focuses on the researchers themselves and does not consider the institutional context or strategies for developing approaches to measuring impact from both a project and institutional perspective.

When viewed from the lens of institutional conditions, frameworks such as the Engaged Participation framework (Ferguson et al., 2022) or the Partnership Building Framework (Jagosh et al., 2015) focus on establishing and growing relationships within the higher education institution ecosystem. However, these frameworks do not entirely address the research projects and their impacts.

Wiek et al., (2014), in a study on the 'societal effects of participatory sustainability research', primarily focuses on the instrumental impacts of engaged research within innovation ecosystems. While this type of framework is valuable for providing assessment elements for SER, it overlooks conceptual impacts, institutional conditions, and the development of research projects.

In a comprehensive scoping review conducted by Beaulieu et al. (2018), a set of essential principles pertaining to standards for engaged scholarship were identified. These principles serve as a guide for engaged research, ensuring its effectiveness and impact. The five key principles that emerged from their study are as follows.

- **High-quality scholarship**: Engaged research must adhere to rigorous scholarly standards, ensuring the reliability and validity of the findings. This principle underscores the importance of employing robust methodologies and maintaining scholarly integrity throughout the research process.
- **Reciprocity**: A crucial element of engaged scholarship is the establishment of mutually beneficial relationships between researchers and the communities they work with. This principle emphasises the need for a reciprocal exchange of knowledge, resources, and benefits, ensuring that all stakeholders involved in the research process are valued and respected.
- **Identifies community needs**: Engaged research must be rooted in a deep understanding of the specific needs and priorities of the communities being studied. This principle highlights the significance of actively involving community members in shaping the research agenda, ensuring that the research outcomes are relevant and address the identified needs.
- **Boundary-crossing**: Engaged scholarship encourages interdisciplinary collaboration and the integration of diverse perspectives. This principle emphasises the importance of breaking down disciplinary silos and fostering collaborations across different sectors, disciplines, and stakeholders. By transcending traditional

boundaries, engaged research can generate innovative solutions and address complex societal challenges more effectively.

- **Democratisation of knowledge**: Engaged scholarship seeks to democratise knowledge by making research accessible and useful to a wider audience. This principle underscores the importance of disseminating research findings in a manner that is understandable and applicable to diverse stakeholders, including policymakers, practitioners, and community members. By sharing knowledge in an inclusive and accessible manner, engaged research can facilitate positive societal change.

Considering the features of these frameworks and standards, as well as the existing gaps, the BETTER Life Project consortium developed a set of standards for SER. The details of this standard will be further explored in the subsequent sections of this report.

1.4 Purpose of the Standards for SER in Life Sciences

The purpose of the standards for SER in LS is to promote a collaborative approach to research in life sciences that considers societal needs. By aligning with transdisciplinary approaches, EU policies, and strategic planning of research and innovation, these standards aim to enhance the relevance and impact of research in life sciences. The key characteristics of the standards are:

- **Alignment with transdisciplinary approaches**: Societal challenges require the integration of knowledge from various disciplines and categories of knowledge, mirroring the transdisciplinary research approach of the SER (Felt et al., 2016). It goes beyond traditional disciplinary boundaries and encourages collaboration among researchers, policymakers, practitioners, and the public, to invent real-world solutions (Hölsgens et al., 2023) and address societal challenges (OECD, 2020). The standards for SER in LS aim to emphasise the importance of transdisciplinary approaches to address societal and environmental issues such as health inequalities, environmental sustainability, and contribution to people's livelihood,

among other topics related to the quality of life in general. These challenges require a holistic understanding and engagement of multiple stakeholders to develop comprehensive and sustainable solutions.

- **Alignment with EU policies**: The standards for SER in LS also seek to align with European Union (EU) policies, which emphasise practices that address societal challenges and contribute to sustainable development. Take, for instance, Horizon 2020 Programme (H2020), to which the European Commission allocated about €80 billion for the 2014-2020 funding period. The commission highlighted responsible research and innovation (RRI) as a priority across all the H2020 activities to deepen science and societal relationships and be responsive to societal challenges (Novitzky et al., 2020). By adhering to EU policies, SER standards ensure that research in the life sciences aligns with EU priorities, such as the European Green Deal, the Digital Agenda, the Sustainable Development Goals, EU Biodiversity Strategy 2030 and the European Sustainable Development Strategy, to name a few examples. This alignment enhances the potential for research outcomes to have a positive societal impact and supports the EU's efforts to promote responsible and sustainable research practices.
- **Strategic planning of research and innovation**: The standards for SER in LS consider the strategic planning of research and innovation. This involves aligning research priorities with broader strategic goals, such as national research agendas, regional development plans, and global initiatives. In Germany, for example, the Federal Ministry of Education and Research (BMBF) has developed the "Future Research and Innovation Strategy" across all ministries. With this strategy, the federal government outlines the objectives, targets, and priorities of its research and innovation policy for the forthcoming years (BMBF, 2023). By integrating SER standards into strategic planning processes, decision-makers can support life sciences and other disciplines to address major social and global challenges such as environmental pollution, climate change, poverty, and the biodiversity crisis.

1.5 Overview of the Framework for SER in Life Sciences

The framework for socially engaged research in life sciences has four dimensions (numbered 1 to 4) and twelve sub-dimensions, as shown in Figure 1. The elements of the framework and its sub-dimensions are briefly discussed below.

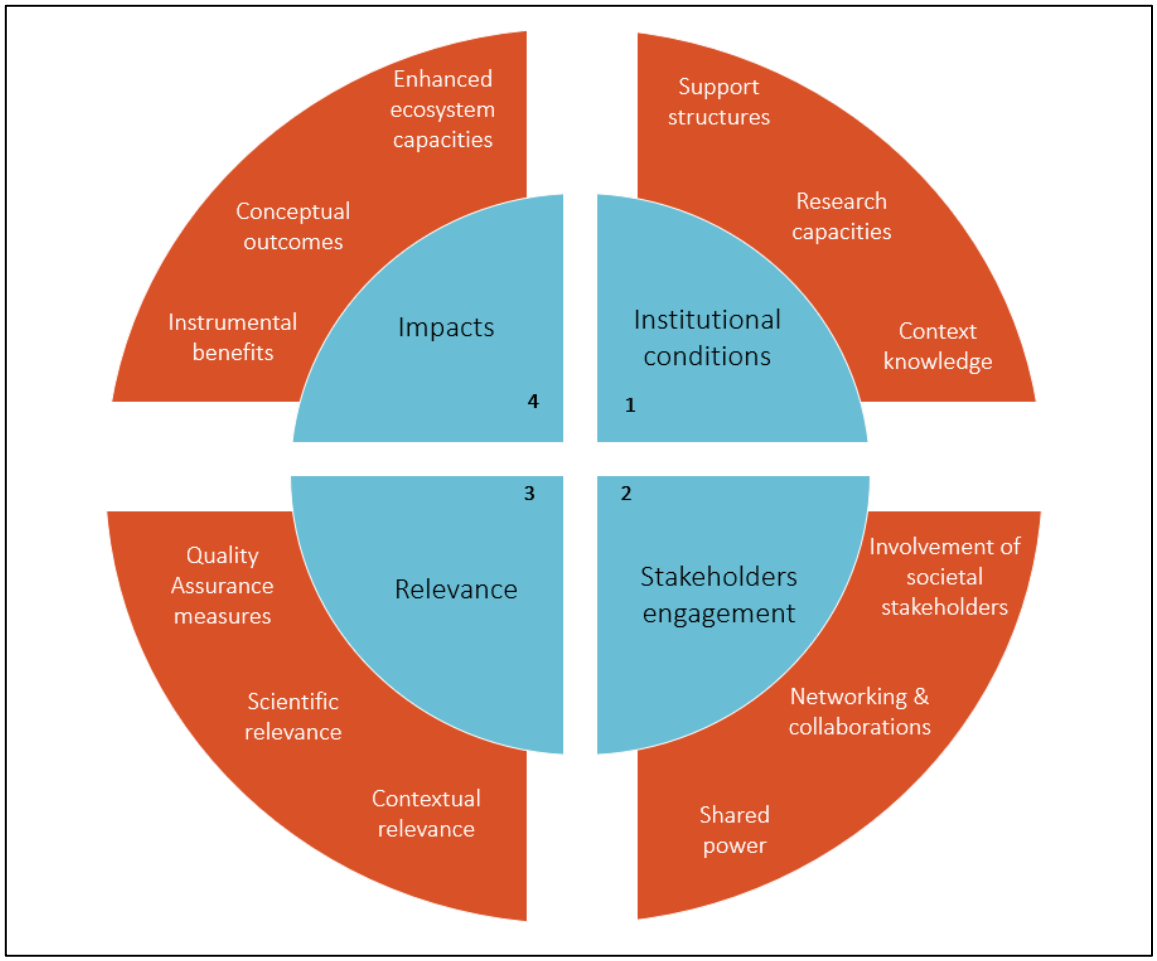

Fig 1. Framework for SER in Life Sciences

1. **Institutional Environment** examines organisational capacities for supporting SER, including available resources and accumulated experiences with external stakeholders. The subdimensions are:
   a. **Support structures** refer to the availability of organisational structures, such as funding, policy frameworks, tools, and administrative support, that enable and foster SER.

b. **Research capacities** address necessary skills and expertise of researchers to engage in SER, including opportunities for participating in institutional and personal capacity building.

c. **Contextual knowledge** points out to the organisation of previous experience, existing impacts, knowledge on the regional challenges and factors that shape research interventions.

2. **Stakeholders Engagement** focuses on the involvement of relevant stakeholders in the research process.

   a. **Involvement of societal stakeholders** in SER processes through co-creation of research questions and methods, collection of data, and sharing of knowledge and expertise.

   b. **Networking and collaboration** emphasise building and maintaining networks and collaborations with stakeholders.

   c. **Shared power** denotes the need for power-sharing among stakeholders, including equitable distribution of resources, decision-making, and recognition of diverse perspectives and contributions.

3. **Relevance** is subdivided into the following.

   a. **Contextual relevance** emphasises that research must be meaningful to stakeholders, focusing on community or societal challenges to make a significant impact.

   b. **Scientific relevance** represents the need for scientifically rigorous research methods and data analysis techniques.

   c. **Quality assurance measures** highlight the importance of incorporating quality assurance, ethics, data management, and stakeholder input into the research process.

4. **Impacts** are centred on the outcomes and effects of the research on society. The subdimensions are as follows.

a. **Instrumental benefits** refer to the tangible benefits that the research brings to society, such as improved health, education, or economic outcomes.

b. **Conceptual outcomes** allude to the new insights, understanding, and conceptual frameworks that the research generates, contributing to the development of new knowledge.

c. **Enhanced ecosystem capacities** focus on enhancing systems and processes for community development, policymaking, and innovation, encompassing social, economic, and environmental aspects.

1.6 Standard Development

The methodology employed in developing the standards for SER closely mirrors the methodology used in creating the framework for SER, as the former builds upon the latter. Hence, the standards outlined in this report were developed using a two-stage participative methodology combined with a desk research approach. In the initial stage of the participative method, a co-creation workshop was organised, bringing together the BETTER Life project consortium partners with experience in life sciences. Through the utilisation of brainstorming and mind-mapping exercises, the consortium partners identified the standards that align with the pre-established framework for SER within the BETTER Life Project. These standards were refined according to a review of existing studies and relevant information. In the second stage of the participative methodology, another workshop involving the consortium partners was held to finetune and validate the developed standards. The methodology employed facilitated the collaborative co-creation of standards by consortium partners from nine institutions, drawing on existing knowledge and validating their alignment with the objectives of the BETTER Life project. The institutions involved in designing the standards include CZU, MLU, UNICAM, ACEEU, EMU, DU, PULS, HELIXCONNECT, and EDUCONS.

2. OVERVIEW AND STRUCTURE OF THE STANDARDS

The formulation of the standards was accomplished through collaborative workshops involving participatory brainstorming sessions and comprehensive mapping exercises among the consortium partners. These efforts culminated in the creation of the standards, which are visually represented in the yellow stickers shown in Figure 2.

The standards are organised according to each of the sub-dimensions of the core framework, followed by guiding questions and examples of evidence of the standards. The insights gathered during the standard development workshops were carefully consolidated and synthesised into comprehensive standards, which will be expounded upon in the subsequent section.

Although the following general overview lacks readability, we include it here to provide an understanding of the overall structure. More detailed information regarding the individual dimensions is presented below (in terms of graphics and content).

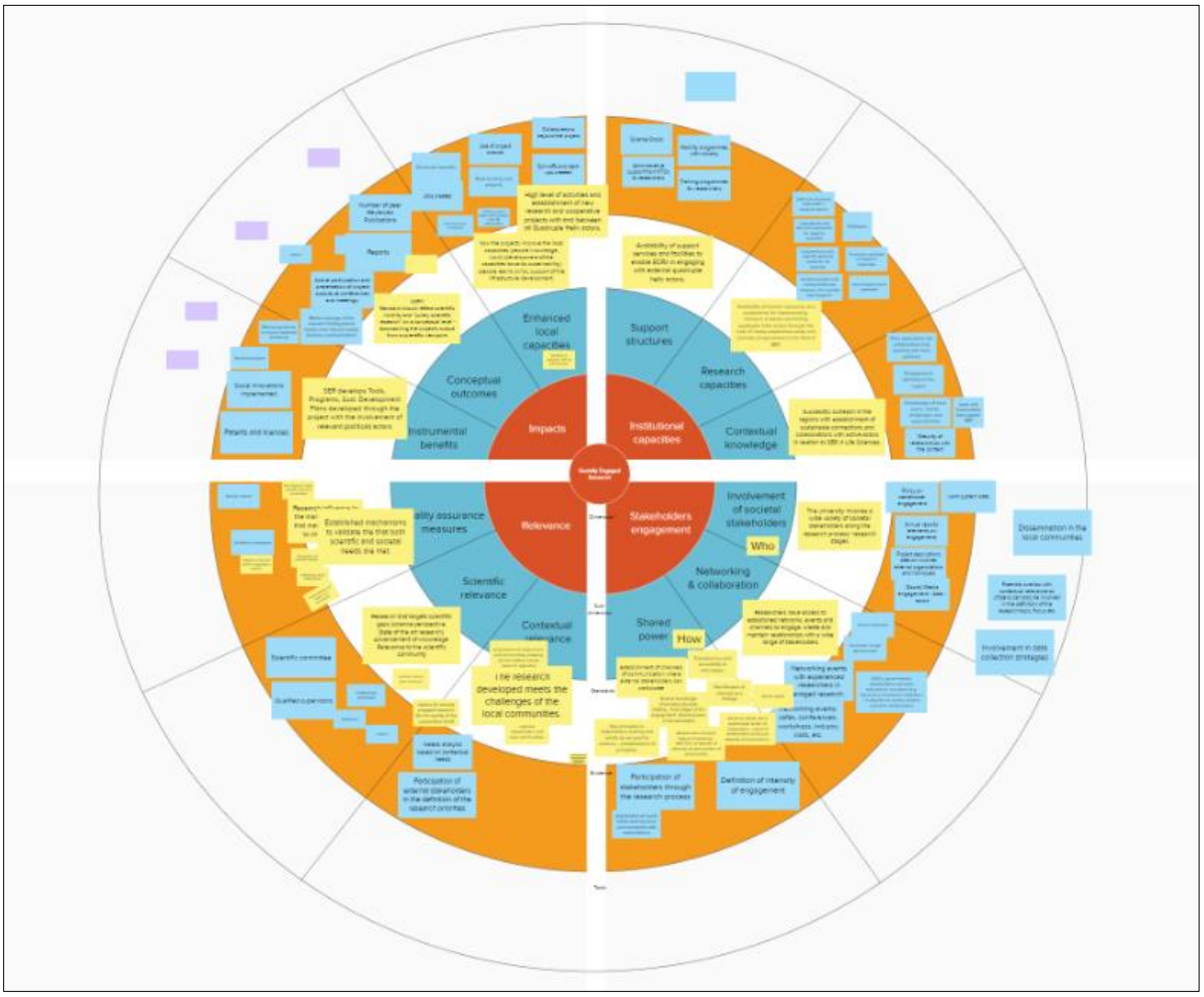

Fig 2. General overview of the result of the workshops conducted with the consortium of the BETTER Life Project drafting the standards for SER in Life Sciences.

2.1 Standards for Socially Engaged Research in Life Sciences

The standards for socially engaged research were conceived as a general guide that will adapt and evolve alongside the development of new needs in life science research and the society. These standards should be interpreted as the 'trunk' establishing the skeleton structure from which a number of 'branches' develop and grow. These branches represent the delivery methods and versatile approaches for conducting research in the field of life sciences. The standards encompass essential aspects such as "what," "who," and "how,"

addressing key questions and offering examples of evidence that can assist early career researchers in evaluating their research methods and strategies.

Dimension 1: Institutional Capacities

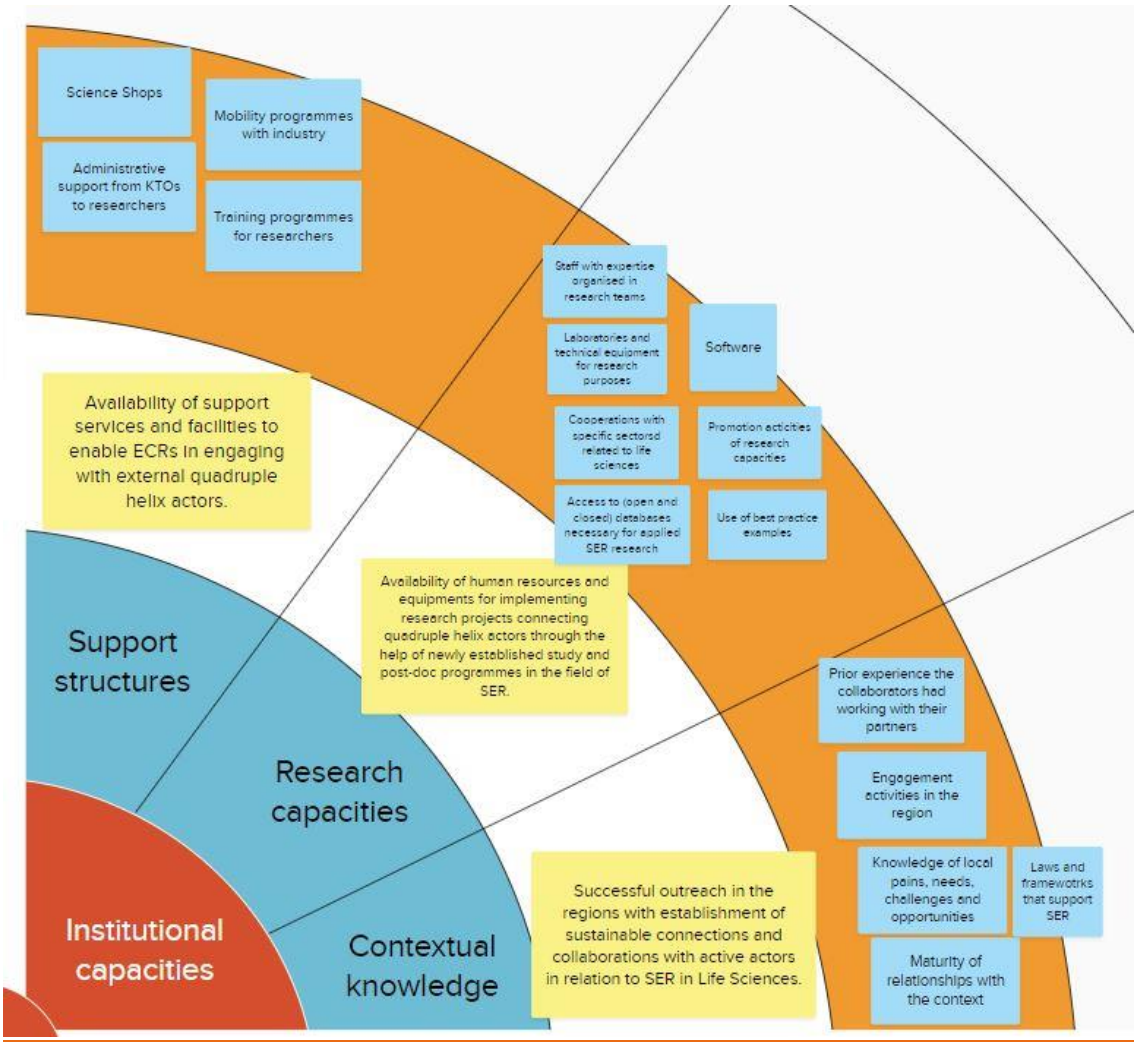

Fig 3. Detail view of the Institutional Capacitites dimension.

Sub-dimension 1.1 Support Structures

STANDARD

Availability of a coherent system of support services and facilities to enable early career researchers to develop the capacity to conduct socially engaged research in life sciences and engage with quadruple helix stakeholders.

GUIDING QUESTIONS	(I) Which support services and facilities are available to support SER implementation, development, and assessment? (II) How do the diverse support staff and researchers contribute to the provision of support services for early career researchers (ECR)? (III) How are internal support services and facilities communicated to ECR?
EXAMPLES OF EVIDENCE	Evidence for this standard includes short training programmes in SER, mobility programmes with industry, science shops, knowledge transfer offices, and facilities for meeting external stakeholders, special office for SER support, existing funding schemes for SER, among others.

Sub-dimension 1.2 Research Capacities

STANDARD	Availability of competent human resources and suitable equipment for implementing SER projects in LS in partnership with quadruple helix stakeholders.
GUIDING QUESTIONS	(I) Which research equipment and facilities are currently available to support SER in LS? (II) What human resources are actively involved to implement SER in LS projects? (III) How can the available human resources and research equipment be utilised in a collaboratively effort to involve the quadruple helix stakeholders?

EXAMPLES OF EVIDENCE	Evidence for this standard includes capacity building programmes related to SER in LS; access to open and closed databases for applied SER; best practice guidelines; staff with expertise and publications within area of SER; laboratories & technical equipment utilised for SER; relevant software; sector-specific cooperation related to life sciences, implemented projects with SER dimension, among others.

Sub-dimension 1.3 Contextual Knowledge

STANDARD	Existing outreach/knowledge and experience on established collaborations and partnerships in the regional ecosystem with stakeholders related to life sciences.
GUIDING QUESTIONS	(I) What is the scope of the existing outreach/knowledge and experience on collaborations and partnerships in the regional ecosystem related to life sciences? (II) Who were/are the key stakeholders involved in the established collaborations and partnerships in the regional ecosystem related to life sciences? (III) How is the outreach/knowledge and experience on collaborations and partnerships in the regional ecosystem systematised and disseminated?
EXAMPLES OF EVIDENCE	Evidence for this standard includes prior experiences collaborators have working with their partners; engagement activities in the region; knowledge of local needs, challenges and opportunities; maturity of relationships with the context;

knowledge of laws and frameworks that support SER, among others.

Dimension 2: Stakeholders Engagement

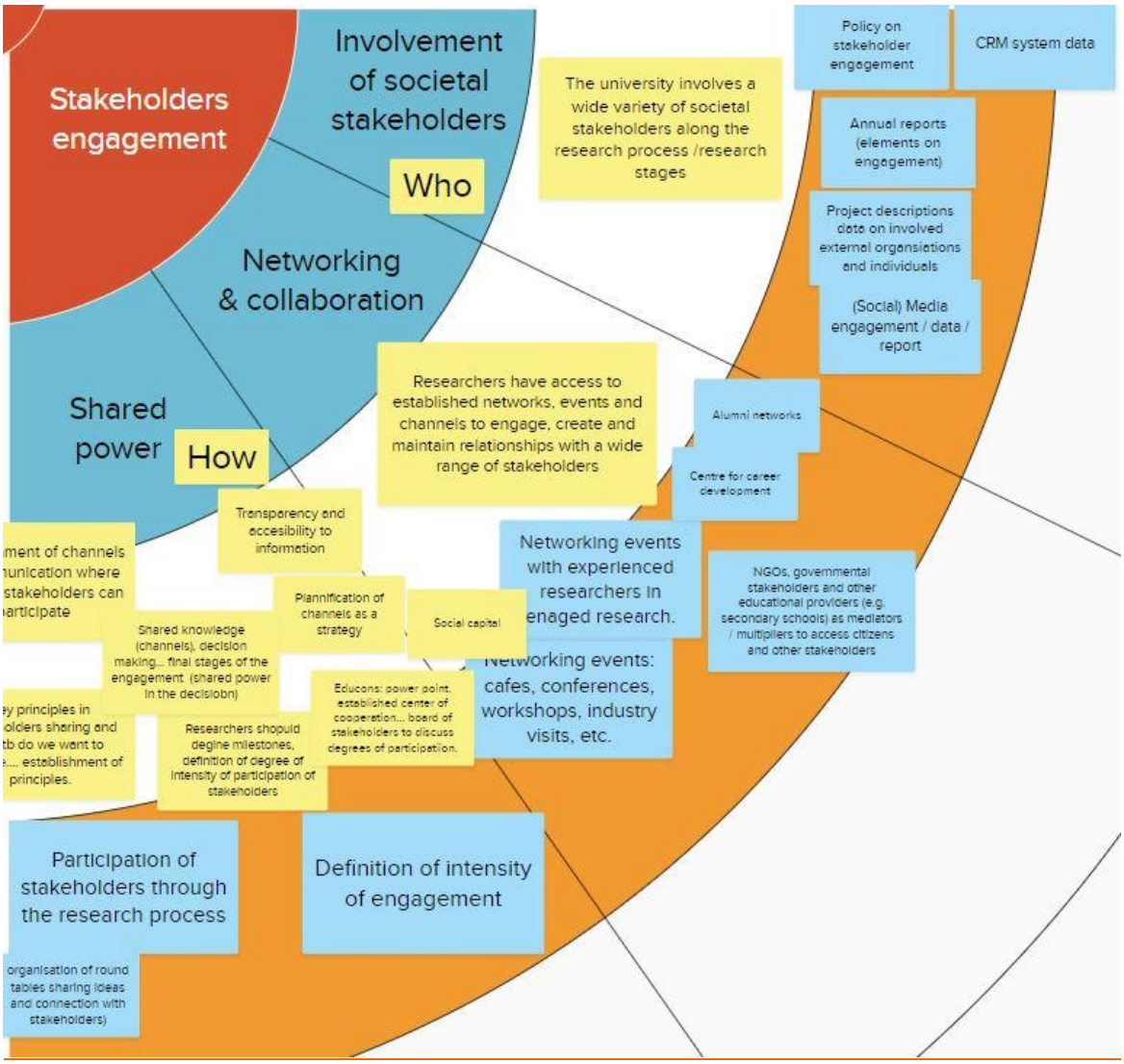

Fig 4. Detail view of the Stakeholders Engagement dimension.

Sub-dimension 2.1 Involvement of Societal Stakeholders

STANDARD

The research conducted in the institution involves a wide variety of societal stakeholders along the research process or stages.

GUIDING QUESTIONS	(I) What are the engagement strategies currently involving societal stakeholders? (II) Who are the societal stakeholders involved in the research conducted in the institution along the research process or stages? (III) How does the institution engage and collaborate with diverse societal stakeholders throughout diverse research stages?
EXAMPLES OF EVIDENCE	Evidence for this standard includes policies on stakeholder engagement; Customer Relationship Management (CRM) systems; annual reports on elements of engagement; project descriptions (data) on involved external organisations and individuals; social (media) engagement data reports, data sharing, among others.

Sub-dimension 2.2 Networking and Collaboration

STANDARD	Researchers have access to established networks, events and channels to engage, create and maintain relationships and cooperation with a wide range of stakeholders.
GUIDING QUESTIONS	(I) What are the established networks, channels or events supporting SER in LS? (II) Who is in charge of managing and enhancing these partnerships?

(III) How does the research project benefit from the networks and established partnerships throughout the research stages or processes in life sciences?

EXAMPLES OF EVIDENCE

Evidence for this standard includes availability and role of: alumni networks and centre for career development; NGOs, government stakeholders and other educational providers (e.g. secondary schools) as mediators/multipliers to access citizens and other stakeholders; networking events with experienced researchers in engaged research; networking events: cafes, conferences, workshops, and industry visits, among others.

Sub-dimension 2.3 Shared Power

STANDARD

The research projects of the institution define the degree of the intensity for the engagement of stakeholders considering their decision-making power along the diverse stages of the process, the communication channels, and the flow of information.

GUIDING QUESTIONS

(I) What are the strategies to define the levels of intensity of engagement with societal stakeholders?

(II) How do the research projects identify the key stakeholder groups and the level of power they have in the projects?

(III) How is the intensity of engagement managed, communicated and executed within the institution?

EXAMPLES OF EVIDENCE	Evidence for this standard includes clearly defined intensity of engagement; participation and responsibilities of stakeholders in the research process/stages; round-table ideas exchange with stakeholders, Gender Equality Plans, antidiscrimination policies, diversity support policies, among others.

Dimension 3: Relevance

Fig 5. Detail view of the Relevance dimension.

Sub-dimension 3.1 Contextual Relevance

STANDARD	The research projects are strategically aligned with the specific challenges faced by local communities, thereby establishing shared research agendas.
GUIDING QUESTIONS	(I) What is the relationship between the research project and specific challenges faced by the local society that the research projects strategically align with? (II) Who is involved in establishing shared research agendas that are aligned with the challenges faced by the local society? (III) What strategies are involved in aligning the research project with specific challenges or needs of local communities to establish shared research agendas?
EXAMPLES OF EVIDENCE	Evidence for this standard includes need analysis reports, evidence of stakeholder participation in defining research problem/priorities, and stakeholder meetings, reflections (feedback) of the local stakeholders as for the meaning of the research, among others.

Sub-dimension 3.2 Scientific Relevance

STANDARD	The research projects target scientific gaps and contribute to the advancement of knowledge relevant to the scientific community.
GUIDING QUESTIONS	(I) What new knowledge or research gaps does the research project contribute to, or fill, respectively, in the scientific community?

	(II) Who bears the responsibility for ensuring that research projects target scientific gaps and propel the advancement of knowledge relevant to the scientific community?
	(III) How do the research projects target scientific gaps and advance knowledge relevant to the scientific community?
EXAMPLES OF EVIDENCE	Evidence for this standard includes scientific committees; qualified supervisors; number of publications; number of citations; conferences, workshops, research strategies of the organisation, among others.

Sub-dimension 3.3 Quality Assurance Measures

STANDARD	The research projects and the research unit include mechanisms to validate that both scientific and societal needs are met.
GUIDING QUESTIONS	(I) What quality assurance mechanisms are available to ensure scientific and societal needs/requirements are met?
	(II) Who is responsible for validating scientific rigour and upholding societal/ethical considerations?
	(III) How are the quality assurance mechanisms utilised to ensure the validation of scientific and societal needs in the research projects and research unit?
EXAMPLES OF EVIDENCE	Evidence for this standard includes quality checks; validation strategies; level of originality (plagiarism software); recognition/research awards; stakeholder satisfaction survey;

availability of quality assurance unit/expert, indicators of university rankings focusing on research, among others.

Dimension 4: Impacts

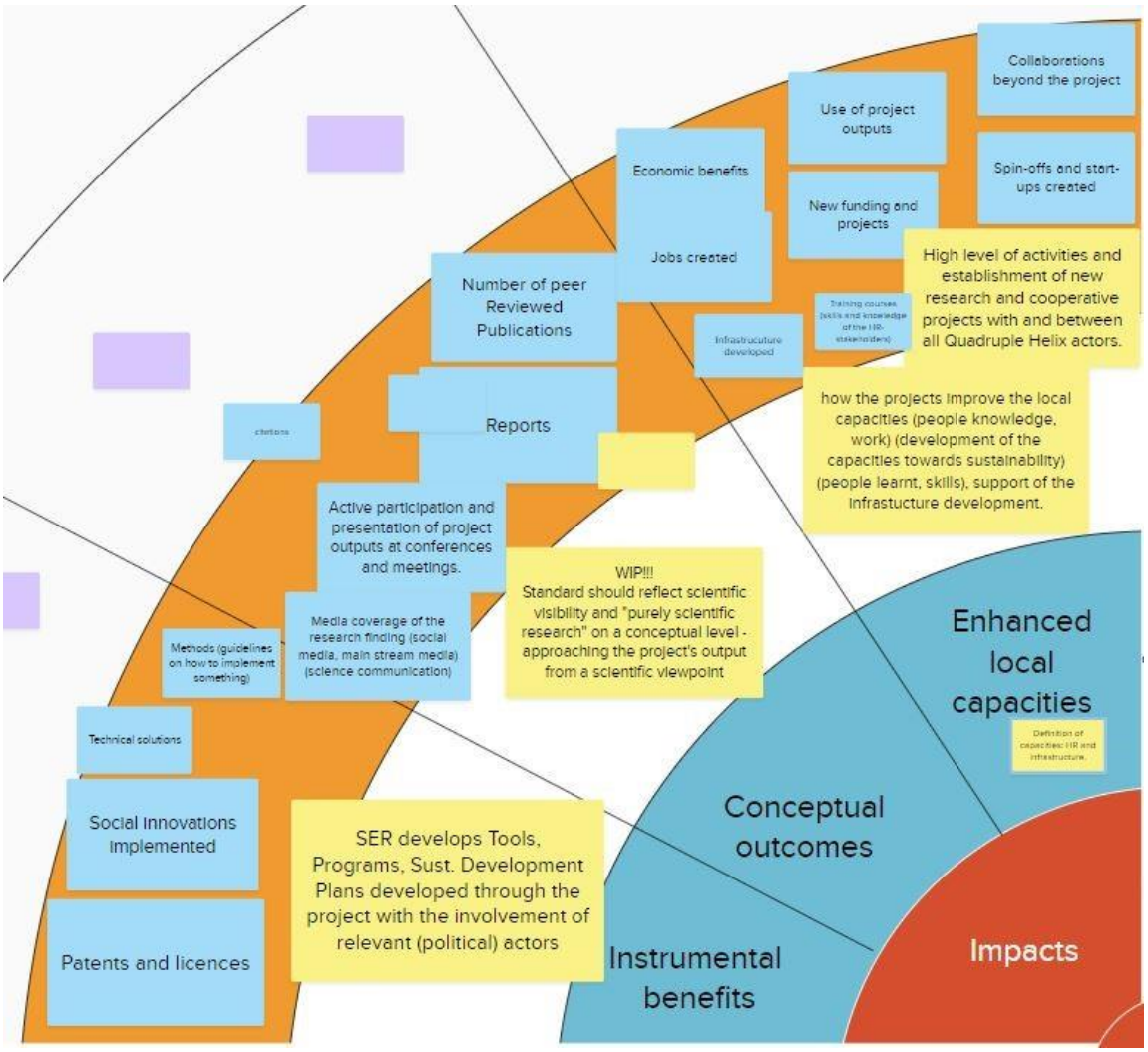

Fig 6. Detail view of the Impactsdimension.

Sub-dimension 4.1 Instrumental Benefits

STANDARD

The research contributes to the collaborative development of various tools, programs, plans, policies, and more, through active engagement with relevant regional stakeholders in a co-creative process.

GUIDING QUESTIONS	(I) What tools, programs, plans, and policies are being collaboratively developed through the research? (II) Who are the key target groups using the instrumental benefits? (III) How does the research actively ensure that their innovation is transferred into usable benefits for society?
EXAMPLES OF EVIDENCE	Evidence for this standard includes patents and licenses; social innovations implemented; technical/non-technical solutions; methods (guidelines on how to implement), data from local societies (regions) about their development linked to innovations brought by the project of SER, among others.

Sub-dimension 4.2 Conceptual Outcomes

STANDARD	The research produces sound and robust scientific outputs visible in scientific publications, conferences, and media which are properly communicated to the public, among others.
GUIDING QUESTIONS	(I) What are the examples of scientific outputs that result from the research? (II) Who is the intended target audience for the scientific outputs arising from the research? (III) How are the scientific outputs, planned, promoted, supported and disseminated?

EXAMPLES OF EVIDENCE	Evidence for this standard includes media coverage of research findings (social media, mainstream media, science communication); citations; active participation and presentation of project outputs at conferences and meetings; reports; number of peer-reviewed publications, presentations for local stakeholders and local societies, among others.

Sub-dimension 4.3 Enhanced Local Capacities

STANDARD	The research fosters regional development by bolstering local capacities through the development of knowledge, skills, infrastructure, and improved working conditions, among others.
GUIDING QUESTIONS	(I) What specific benefits does the research generate to enhance local capacities (development of knowledge and skills, infrastructure, improved working conditions)? (II) Which specific target groups within the local community benefit from enhanced capacity building? (III) How are the capacity building actions implemented to enhance local capacities and foster regional economy?
EXAMPLES OF EVIDENCE	Evidence for this standard include economic benefits; jobs created; infrastructure developed; training courses (skills and knowledge enhanced); new funding projects; use of project outputs; collaborations beyond the project; spin-off, and start-ups created.

3. CONCLUSIONS

The objective of this report was to describe guiding standards for socially engaged research in life sciences within the scope of the BETTER Life project. The standards were developed through a comprehensive approach that integrated desk research with a collaborative two-stage methodology featuring co-creation workshops conducted among consortium partners.

In the first workshop, consortium partners identified standards corresponding to the pre-established SER framework. Subsequently, in the second workshop, the partners refined and validated the developed standards. Twelve standards were meticulously developed, with three dedicated to each of the core framework components of SER in LS. These components encompass institutional capacities, stakeholder engagement, relevance/adequacy, and impact.

Each standard comprises guiding questions and concrete examples of substantiating evidence, which facilitate the interpretation and utilisation of the standards. The standards should be interpreted as the 'trunk' establishing the skeleton structure from which 'branches' develop and grow. In essence, the standards are intended to serve as a guide for conducting socially engaged research in life sciences.

Furthermore, the standards above serve as a framing construct for the design a set of specific toolkits as a separate deliverable to be developed under the project's umbrella. As such, these toolkits will be aligned with the standards and will provide ECR and quadruple helix actors with a set of informative and interactive tools to promote communication amongst the actors and foster engaging and responsible social research in life sciences. Digital centres for excellence will be established in the research regions through which the various toolkits will be developed, managed and implemented in cooperation with relevant stakeholders in the region.

REFERENCES

Beaulieu M, Breton M, & Brousselle A. (2018). Conceptualising 20 years of engaged scholarship: A scoping review. PLOS ONE 13(2): e0193201 https://doi.org/10.1371/journal.pone.0193201

BMBF. (2023). Future research and innovation strategy. The Federal Ministry of Education and Research. https://www.bmbf.de/bmbf/en/research/future-research-and-innovation-strategy/future-research-and-innovation-strategy_node.html

Bowman, S., et al. (2018). A framework for engaged research: Society and higher education addressing grand societal challenges together. https://www.campusengage.ie/wp-content/uploads/2018/12/Framework_for_Engaged_Research_May_18_Web.pdf

Carayannis, E. and Campbell, D. (2009). 'Mode 3' and 'Quadruple Helix': Toward a 21st century fractal innovation ecosystem. International Journal of Technology Management 46, pp. 201–34. https://doi.org/10.1504/IJTM.2009.023374

European Committee for Standardization (CEN) and European Committee for Electrotechnical Standardization (CENELEC). (2021). European Standards. https://www.cencenelec.eu/european-standardization/european-standards/

European Committee of the Regions, Volpe, M., Friedl, J., Cavallini, S., et al. (2016). Using the quadruple helix approach to accelerate the transfer of research and innovation results to regional growth. Committee of the Regions. https://data.europa.eu/doi/10.2863/408040

Felt, U., Igelsböck, J., Schikowitz, A., & Völker, T. (2016). Transdisciplinary sustainability research in practice: Between imaginaries of collective experimentation and entrenched academic value orders. Science, Technology, & Human Values, 41(4), 732–761. http://www.jstor.org/stable/24778197

Ferguson, D.B., Meadow, A.M. & Huntington, H.P. (2022). Making a difference: Planning for engaged participation in environmental research. Environmental Management 69, 227–243. https://doi.org/10.1007/s00267-021-01585-5

Garrett, J., & Moarif, S. (2018). Reporting on capacity-building and technology support under the Paris Agreement: Issues and options for guidance. OECD/IEA Climate Change Expert Group Papers 2018/01, OECD Publishing. https://doi.org/10.1787/f5330a47-en

Hölsgens, R., Wascher, E., Bauer, C., Boll, J., Bund, S., Dankwart-Kammoun, S., Heese, I., et al. (2023). Transdisciplinary research along the logic of empowerment: Perspectives

from four urban and regional transformation projects. Sustainability, 15(5), 4599. MDPI AG. Retrieved from http://dx.doi.org/10.3390/su15054599

Jagosh, J., Bush, P.L., Salsberg, J. et al. (2015). A realist evaluation of community-based participatory research: partnership synergy, trust building and related ripple effects. BMC Public Health 15, 725. https://doi.org/10.1186/s12889-015-1949-1

National Coordinating Centre for Public Engagement – NCCP. (2020). Tools for talking… about public engagement. https://www.publicengagement.ac.uk/sites/default/files/publication/tools_for_talking_about_public_engagement_-_final_version_0.pdf

Novitzky, P., Bernstein, M., Blok, V., Braun, R., Chan, T.T., Lamers, W., Loeber, A., Meijer, I., Lindner, R., & Griessler, E. (2020). Improve alignment of research policy and societal values. Science 369,39-41. https://doi.org/10.1126/science.abb3415

OECD. (2020). Addressing societal challenges using transdisciplinary research. OECD Science, Technology and Industry Policy Papers, No. 88, OECD Publishing, Paris, https://doi.org/10.1787/0ca0ca45-en

Wiek, A., Talwar, S., O'Shea, M., & Robinson, J. (2014). Toward a methodological scheme for capturing societal effects of participatory sustainability research. Research Evaluation, 23, 117-132. https://doi.org/10.1093/reseval/rvt031

BETTER
Life