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Executive Summary

This document represents an inventory of 43 RRI Governance Innovation Practices (RRIGIPs), detected in RRI projects conducted in Europe and beyond. This inventory has been created within the context of TeRRItoria EU project (WP3, Task 3.2) and with the aim to identify useful and innovating RRIGIPs, which can provide valuable insights for designing and implementing the five Transformative Experiments that the projects foresees. These practices have been selected within a solid thematic and theoretical framework and through a thorough methodological procedure. This procedure has been comprised of four complementary to each other steps, where from the initial 80 projects, the final 15 projects and corresponding 43 practices were placed in the inventory. These 43 practices have been critically analysed mainly through desk research, as well as through interviews with the promoters of some of these practices. The variables that contributed to their analysis were namely: general description, objective, policies/strategies, synergies and correlations, barriers (and incentives), impact (inside and outside the ecosystem). After the analysis, certain conclusions were reached in relation to tendencies and 'trends' identified within the aforementioned practices for the implementation (or even institutionalisation) of the RRI approach and any of each basic tenets - keys. The tendencies and accompanying conclusions do not represent a set of universal guidelines for implementing RRI, since context is a major parameter that always needs to be taken into account. Their value lies in critically elaborating on some policies that can aid institutions ameliorate even their most intimate mechanisms through an efficient RRI uptake (based on their own aims), as well is in providing a valuable input for the consequent construction of a map of approaches, policies and tools for Territorial RRI (Task 3.3) and the execution of the envisaged experiments.



1. Introduction

1.1. This deliverable

This document represents **TeRRItoria Project Deliverable (D3.2)** *Inventory of RRI governance innovation practices*, where the knowledge already produced by SwafS - RRI projects has been capitalised in order to identify 'useful' means of RRI Governance Innovation, so as to afterwards develop the project's transformative experiments. To this end, an analysis of the intermediate and final results of various projects and corresponding practices has been conducted.

This deliverable is the outcome of **Task 3.2** – *Mapping Governance Innovation Practices in Europe and beyond* (led by SEERC), and is structured around five chapters. The introductory chapter represents the main content and objectives of TeRRItoria, WP3 and Task 3.2, while the second chapter comprises the thematic and theoretical framework underlying Task 3.2. Afterwards, the third chapter refers to the methodological framework applied for creating the RRI inventory and, concurrently, chapter 4 depicts the actual analysis of RRI practices and the inventory. The fifth and final chapter constitutes the summary of this deliverable, where the valuable insights that have been gained on RRI practices are being reported.

1.2 The TeRRItoria project

The vision of the TeRRItoria project is to tackle a double challenge: to bring RRI at the forefront of the debate for developing local and regional R&I capacities; and to use RRI as a springboard for broadening the number of stakeholders involved in the process, for enhancing the regional research and innovation strategies under the framework of S3. The overall objective of the project is to experiment with the adoption of Responsible Research and Innovation (RRI) approach in European regional and territorial R&I systems. TeRRItoria is based on the idea that RRI approaches, policies and practices, developed so far at the level of research institutions, may be adapted to that of regional and territorial governance. Thus, the project will contribute to developing what can be called **"Territorial RRI"** by developing a set of

transformative experiments in five European selected territories – four regions and one municipality.

TeRRItoria is led by the European Science Foundation (ESF) and responds to the Topic "Supporting the development of territorial Responsible Research and Innovation" of the Call "Science with and for Society", included in the H2020 WP 2018-2019. Proposals under this topic are intended to contribute to the strategic orientation of "Building the territorial dimension of SwafS partnerships" (SO3). The project is structured in nine work packages and in three different and consecutive strands; **Analytic, Reflexive and Pro-active Strand.** Work Pachage 3, in which Task 3.2 and D3.2 are included in, belongs to the Analytical Strand, which provides a set of organised information maps for supporting the design of the five experiments.

1.3 WP3 and Task 3.2 – Aims and structure

As mentioned above, WP3 belongs to the analytical strand of the TeRRItoria project. The activities under the analytical strand have different objectives, and especially WP3 refers to



mapping governance innovation approaches. This map of governance innovation has as output a "menu" of tools, approaches and policies useful for the reflection phase and for the definition of the TeRRItoria experiments.

WP3 is led by Knowledge and Innovation (K&I) and sees the active participation of SEERC in guiding part of the activities. The WP is divided into three tasks, dedicated respectively to the creation of the inventory of bottom-up governance practices (Task 3.1, K&I), to the inventory of RRI governance innovation practices (Task 3.2, SEERC), and to the creation of a map of approaches, policies and tools for territorial RRI (Task 3.3, K&I). More specifically, during Task 3.2 the main activities to be conducted are:

- a) singling out RRI governance innovation practices
- b) developing, for each governance innovation practice, a standardised presentation grid
- c) establishing contacts with the promoters of such experiences in order to fill in information gaps
- d) developing and formalising the inventory (D3.2).



2. The core thematic and theoretical aspects of Task 3.2

2.1 Thematic framework

The project highlights the aim of RRI to involve society in science and innovation 'very upstream' in the processes of R&I so as to align its outcomes with the values of society, as well as the need to increase the capacity of regional R&I systems to be inclusive, anticipatory, reflexive and responsive (Marschalek, 2017). Concurrently, it places the theme of territorial RRI within the critical context of the profound transitions underway in contemporary societies; reference is made to the phenomenon of weakening the structures that regulated and ordered life in modernity (including institutions, norms, values, etc.) and to the growth of autonomy and relevance of social actors (whether they are individual and collective).

In particular, the project refers to the process that questions the role of traditional institutions, including those in charge of scientific and technological research and those responsible for territorial management, as well as to the growing urgency for development plans and practices that will encourage us to "rethink the linear model of science, the innovation policies and the social contract for science" (Owen et al, 2012, p.752). Therefore, two concrete phenomena would be dealt with: on the one hand the crisis in research systems, not only in their relations with society but also in the intimate dynamics of doing science. On the other hand, the de-territorialization processes connected with globalization, digitization, etc. that undermine social cohesion and local development (i Martí, 2006).

Within this context, **the Governance Innovation Practices on Territorial RRI** are understood as those practices in which new configurations of actors are developed, in order to cope with the two aforementioned criticalities and to activate processes of reterritorialisation and re-socialization of scientific and technological research. TeRRItoria tries to benefit of the experiences accumulated by governance innovation for the development of its 5 transformative experiments. This is done by identifying and analysing in depth a set of practices, approaches and policies developed within the context of the most promising RRI projects in Europe which, through the configuration of the actors involved and through these actors' dynamics of changing social schemes and processes, can lead to inclusive, reflective and transparent societies.

2.2. Theoretical framework

According to the project's proposal, the map of governance innovation at the territorial level (WP3) will take into consideration two types of governance innovation: a) bottom-up experiences connected with the R&I societal challenges (energy, mobility, climate change, security, etc.) not necessarily labeled under RRI; b) the explicit RRI practices developed under EU Research and Innovation framework (in particular SwafS projects).

Therefore, the map focuses on two different theoretical strands, but in a certain sense complementary and convergent:

-> A theory of bottom-up governance innovation (Task 3.1)

-> A processual theory of Responsible Research and Innovation (Task 3.2)



Bottom-Up Governance Innovation

The assumption underlying this approach is that it is possible to identify in reality some emerging social or governance configurations capable of responding to the challenges and transformations taking place at the general level. These emerging experiences have been defined in the project as bottom-up governance innovation practices (BUGIP), and they are analysed by K&I in Task 3.1.

> A processual theory of Responsible Research and Innovation

The processual RRI theory develops an "introverted" perspective, in which the responsibility of R&I is within the institutions. This theory is based on the idea of reading the different RRI keys not so much as a set of good practices to be adopted, but as a "key" to access those emerging processes and transformative forces (and related actors) that already have a series of effects directly within research institutions, changing even their most intimate mechanisms. These ongoing transformations are a source of risks and controversies but also of opportunities, and they risk remaining unmanaged, or poorly managed, if there's not an innovation in the governance of R&I systems. It is only through this innovation that the building blocks of R&I systems can be responsively altered towards being truly aligned to society's needs.

In a stylized way, this series of processes and actors can be identified starting from the 5 keys of the RRI.

- <u>Gender Equality</u> > Affirmation of women in science and in society; Women in science; women's groups as stakeholders; end users (men and women)
- <u>Education</u> -> Crisis of hierarchical culture; Students, youth groups and associations, teachers, schools, etc.
- <u>Open Access</u> -> *Digital transition*; Publishers, Libraries, IT companies, companies, etc.
- <u>Ethics</u> -> *Emergence of new ethical demands*; religious groups, various types of associations, animal rights activists, environmentalists, businesses, etc.
- <u>Public engagement</u> -> *Emerging of the knowledge society*; citizens, other actors on the territory [this is in some way overlapped with the BUGIP approach]
- RRI Unified Approach -> Some processes and actors may also refer to an inclusive, unified RRI approach, where the aim is to develop and integrate RRI holistically (the focus is not on a specific key or keys)

The RRI approach, already experimented in the scientific field, can be adapted to the territorial R&I systems such as smart specialization strategy, clusters and other different innovation ecosystems (e.g. for the RRI key "gender equality", considering the involvement of women entrepreneurs, etc.).

The fact that the policies have focused on these issues is indicative of the fact that it has been attempted so far to develop governance strategies and innovations to deal with these



processes. The experiences developed so far in this field can be called RRI Governance Innovation Practices (**RRIGIP**). In such experiences, the emphasis is on the governance of emerging processes and the involvement of the related actors, rather than on a prescriptive vision (where the solutions have already been worked out and the whole problem lies only in their application).

What we are interested in	What we are not interested in
All those RRI Governance Innovation	The application of good practices as an end
Practices (RRIGIP) that are oriented to the	in itself, the box ticking exercise, the
governance of ongoing processes,	application of practices (even innovative
emphasizing the internal, institutional	ones) but which do not impact on the
changes (and also the broader changes that	governance of research institutions and
occur outside the ecosystem and are hints of	systems.
true innovation)	



3. Methodological framework

Based on the theoretical framework described above, the creation of the RRIGIP inventory entails the following a) the selection of RRIGIP to be included in the inventories; b) a first analysis of the identified practices and their cataloging in an inventory; c) the drawing up of the "map" through the analysis of the RRIGIP inventory and the BUGIP inventory.

3.1. The selection of Governance Innovation Practices

The realization of the inventory has been based on: examination of the experiments; identification of sources; selection criteria and selection process. Concurrently, the idea is to use, as far as possible, the same tools for the RRIGIP inventory and the BUGIP inventory. Where differences are expected, these is explicitly mentioned.

3.1.1. Summary of the experiments

Given the limited time and resources for the implementation of the map of Governance Innovation Practices on territorial RRI, it would be impossible to provide an exhaustive picture of this phenomenon in Europe. So, the map has focused on the objective of providing useful tools for carrying out the transformative experiments envisaged by the project. On the basis of the information already produced by the territorial partners, a very short and preliminary summary of the experiments draft has been carried out, aimed at identifying for each experiment:

- the field of application (agriculture, energy, etc.)
- the disciplinary areas involved
- the types of interventions planned on the territory
- the types of institutional change envisaged
- the RRI key/keys
- the main players involved

This information has allowed to orient the next steps: the selection of the sources, and the selection criteria (see 3.1.2. And 3.1.3.).

3.1.2. Sources

- RRIGIP: programmes on RRI financed by SWAFS; other RRI programmes at territorial level, e.g. in INTERREG; projects related to S3 and to the RRI keys.
- Useful sources for detecting RRI practices were, for instance, <u>Cordis EU research</u> <u>results</u>, <u>RRI Tools</u>, <u>FOSTER</u>, <u>Interreg Europe</u> etc.



3.1.3. Selection criteria

The first set of selection criteria referred to the 5 keys of RRI + Governance.

- <u>Governance</u>: the project's relevance to *Governance practices*. *Governance of RRI* implies any form of coordination designed to foster and mainstream RRI (or any of its keys) within an organization or in the interaction with other stakeholders. The criterion of *Governance* consists of five other sub-criteria:
 - <u>Innovativity</u>: RRIGIPs identified should correspond to the mentioned theoretical framework and to the innovativity criteria (change is needed to cope with new challenges).
 - <u>Stake</u>: the identified RRIGIPs should have a clear stake, that is that of territorial development and innovation, but also that of the governance of research and innovation processes and systems.
 - <u>Impact</u>: the selected RRIGIPs must have had impact, actual or potential (in terms of economic, institutional, regulatory, social or equality progress), in the territory or within the involved research institutions.
 - <u>Transparency</u>: the selected RRIGIPs must be well documented, and must "tell" what has been done. Besides being a methodological criterion (without transparency it would be difficult to make the selection and gather information), this criterion also indicates a high degree of reflexivity of the selected innovations. In the case of RRIGIPs, this criterion can be applied with greater flexibility, given that the sources can be deepened by direct consultation.
 - <u>Relevance</u>: the selected RRIGIPs should be useful for carrying out the transformative experiments of the project. In this regard, the reference point will be the summary of the experiments (3.1.1.)
- <u>RRI Unified approach:</u> the project's relevance to an RRI unified approach (all the RRI keys combined to an inclusive, unified and holistic approach there is no explicit focus on a specific key or keys)
- <u>Gender Equality:</u> the project's relevance/focus on the RRI key of *Gender Equality*
- <u>Public Engagement:</u>the project's relevance/focus on the RRI key of *Public Engagement*
- <u>Science Education</u>: the project's relevance/focus on the RRI key of *Science Education*
- <u>Ethics</u>: the project's relevance/focus on the RRI key of *Ethics*
- <u>Open Access</u>: the project's relevance/focus on the RRI key of *Open Access*
- <u>Smart Specialization Strategy (S3)</u>: Since the RRI approach can be adapted to the territorial R&I systems, the interrelation between RRI practices and *S3* is also be valued. *S3* is perceived as an innovation policy concept that aims to boost regional innovation, contributing to growth and prosperity by helping and enabling regions to focus on their strengths and regional competitive advantages.
- <u>Regional policies</u>: In the case of absence of a concrete S3 policy, RRI may be linked to other regional policies that foster the region's development and growth.
- <u>Related territory:</u> Certain practices/projects selected to be included in the inventory may have a very specific application area (e.g. health or agro-food sector), that coincides with an equally specific application area of the future experiment of a region participating in the project. In this case, this correlation has been highlighted, so as to provide the partners with additional information on practices relevant to their future experiments.



All these selection criteria were assigned an evaluation score, that allowed to conduct a quantitative analysis of the RRI projects. The evaluation score was formed as follows;

- RRI keys + Governance, RRI Unified approach: from 0 to 3
 - 0 = no relevance to the specific approach/key
 - 1 = a discrete interconnection to the specific approach/key
 - 2 = the project is relevant to the specific approach/key
 - 3 = the project is strongly relevant to the specific approach/key
- Five sub-criteria for Governance (Innovativity, Stake, Impact, Transparency, Relevance): from 1 to 3

1 = low score 2= medium score 3 = high score

- For the rest of the selection criteria (Smart Specialization Strategy-S3, Regional policies), as well as for certain other variables that were employed for listing and describing the projects (e.g. Level of completion) different values/scores were assigned: from 0 to 1
 - S3, Regional policies: 0 = no
 - 1 = yes
 - Level of completion: 0 = ongoing project
 - 1 = closed project

3.2 Selection procedure and creation of the inventory

The RIGIPs are very often already ongoing practices, or cannot be given for granted that the successful practices can be singled out through document analysis. For this reason, a selection procedure by using RRI project as observation platform for singling out the practices has been developed. The RRIGIPs were selected and analysed through a <u>four-stage process</u>.

- <u>First-stage selection</u>: During this preliminary stage, approximately 80 interesting RRIGIPs were selected and analysed (see attached excel file, *List of RRI projects first stage*), based upon the basic, publicly available information detected for them.
- <u>Second-stage selection</u>: Afterwards, approximately 50 experiences that had a high evaluation score and mainly the ones that were more **relevant** and **potentially useful for TeRRItoria's future experiments** were selected and further analysed (see attached excel file, *List of RRI projects_second stage)*. The selection criteria mentioned in section 3.1.3. were employed. Besides the section above, these criteria and their evaluation scores are also described in the corresponding excel file.
- <u>Third-stage selection</u>: This was the stage where the actual creation of the **inventory** and the cataloguing of the experiences began. During this stage, approximately 15 projects were selected according to the information compiled, their evaluation scores applied in



the second stage and mainly their **relevance** towards TeRRItoria's future experiments. They were then placed in the inventory. It should be mentioned that some projects with a considerable evaluation score and relevance to the future experiments were not listed, since they were being executed at the time period of compiling the inventory (this would consequently lead to several information gaps and fewer practices for analysis).

Regarding the projects of the inventory, the practices included in each project were analysed, and different variables contributed to their analysis. Each project was seen as a container of practices and in each project one could find several practices (e.g. related to the different RRI keys); in other words, each project was considered as a source, while the practices as the units of analysis. It is also worth highlighting that at this stage, there was a shift from a quantitative to a qualitative analysis and this in-depth qualitative analysis of the 15 projects' practices also entailed interviews with the promoters of the experiences. Finally, for the 15 projects of the inventory, 43 practices were identified and analysed. While it was planned to conduct interviews with the promoters of all the 15 projects that had been selected for analysis, the project team managed to get in contact with approximately half of them, since during this specific time period some of them were unavailable or out of their offices. Nevertheless, the information they provided on the RRI practices proved to be a valuable input; it allowed to fill in any information gaps, as well as to better comprehend the rationale of the RRI mechanisms that they had developed.

Template A below depicts the analysis grid and the aspects examined for each practice of the inventory.

A1	A2	A3	A4	A5	A6
General description (project, leader, country, time frame, RRI key, S3 etc.)	Objective (<i>why</i> these activities were promoted)	Policies / Strategies (<i>how</i> these activities were implemented)	Synergies and Correlations	Barriers (and incentives)	Impact (inside and outside the ecosystem)

Template A. Analysis grid and aspects examined for the practices of RRIGIPs

These six variables contributed to thoroughly analysing the practices of RRIGIPs, and are described in more detail below. It should be once again underlined that the same project could be assigned a number of practices.

A1: This aspect examined referred to the basic information for the practice. First of all, the project to which the practice was included was mentioned. Then, the leader of the project and the leader of the practice were reported (and the country where they were based). The leader/coordinator of the project as a whole and the leader of the practice might have been different and, in this case, the leader of the specific practice under analysis should have been identified (if possible). When it comes to the time frame, if the practice was included in a closed project, it should be mentioned during which period it had been applied (e.g. during which WP). If the practice was included to an ongoing project and had not yet been applied (or was being applied at that time) this should be explicitly mentioned. Finally, since we were dealing with RRIGIPs, it was indicated to which RRI key(s) the practice was related to (*Governance*,





Gender Equality, Public Engagement, Science Education, Ethics, Open Access). An RRI Unified approach may have also been applied. Any relation of the practice with Smart Specialization Strategy (S3) or other regional policies that contributed to the region's development and growth were highlighted as well.

A2: This aspect focused on the rationale behind these practices, attempting to interpret why these practices were applied (e.g. for innovation, for public engagement, for solving particular problems on demand, for responding to particular demands within the project etc.). The **objective** of the practice was indicated.

A3: The "methodology" applied within the practice was analysed. In terms of methodology, we referred to the **policies/strategies** adopted for reaching the objectives of the practice (e.g. creation of specific platforms when the objective is public engagement). The individuals behind these strategies were also indicated (e.g. research groups, stakeholders etc.).

A4: The synergies (with whom the practices were implemented) that had taken place during the practice were analysed. In terms of synergies, the collaborations with various external actors (such as social groups, stakeholders, industrial representatives, research organizations etc.) were indicated. It was also possible to mention the correlations of a practice with previous projects or frameworks -if any- (e.g. when a practice was the based upon the methodology or the conclusions/tools of a previous project).

A5: Barriers and obstacles to the implementation of the practice were analysed. These barriers might have been legislative, economic/lack of resources, might refer to mentalities and lack of support/individuals promoting the practice, time limitations etc. Along with the barriers, if there was a very specific **incentive** for implementing the practice, this could be indicated as well.

A6: The **impact** of the practice was thoroughly analysed. First of all, there was a reference to <u>the impact inside the ecosystem</u>, referring to the **institutional changes** that had emerged inside the ecosystem itself that had promoted the practice (e.g. a research center/ RFPO). Then, <u>the impact outside the ecosystem</u> was taken into account, in other words the **broader** (or even unexpected) impact that had emerged out of this practice, which was actually a hint of true innovation. For instance, in the case of a gender equality practice, the impact inside the ecosystem might have been the structural changes in RFPOs that were involved in the practice and had adopted the proposed gender equality plan. Regarding the impact outside the ERA objectives for more women having access to high authority positions. Finally, with respect to *impact*, some tools that had emerged out of the practice could be reported, as well as some innovative dissemination methods, but only in the case that there was an actually remarkable dissemination method (i.e. not the mainstream workshops and newsletters).

Once all the above processes were completed, and especially when the practices of each project had been thoroughly analysed (in correspondence to the information provided by the promoters of the practices when this was feasible), the RRIGIP inventory was finalised. This



subsequently led to a **fourth stage**, where the finalised inventory lead to a new synthesis, with a summary of the results and the conclusions drawn about the RRI practices (chapter 5).

3.3. Additional procedures for the RRIGIP inventory

Once the 15 projects had been selected and some of them had already been analysed by SEERC, the inventory was disseminated to the partners. Besides these 15 projects, 5 additional projects (projects 16-20, see Table 1) were listed, since they were also worth analysing in case the primary fifteen projects created any information gaps. This actually occurred in the case of *Thinking Smart* project which was selected to be analysed for its heavy reliance to RRI and S3. There was no publicly available information (relevant websites were no longer active) and the project team did not manage to come in contact with any individuals involved in the project. Therefore, *Thinking Smart* was replaced with the *EnRICH* project that was listed among the additional five projects.

Moving further, project partners were also able to examine which projects had been selected for the inventory and, if they wished, they could also undertake the analysis of a project that they had been strongly involved in, that was relevant to a future experiment, or that had been coordinated/promoted by an institution they had already collaborated with. It should be underlined that if partners wished to examine in detail another project that had not been listed within the RRIGIP inventory (e.g. in case there was an existing cooperation with the promoter of another experience that would facilitate the interview process, or in case they considered that the analysis of another project would prove to be more useful for a future experiment), they had the ability to consult the list of the 50 projects (second stage selection). Then, they could propose to replace one project from the third-stage inventory with the one they wished to analyse from the second-stage list. It should be underlined that this analysis on behalf of the partners was by no means necessary and a prerequisite in the task. It was only a suggestion so as to be included and more engaged in the task, if they wished to.

No	Project name	RRI key/approach
1.	EQUAL-IST	Gender Equality
2.	STAGES	Gender Equality
3.	GENERA	Gender Equality
4.	ENGAGE	Science Education
5.	CREATIONS	Science Education
6.	INHERIT	Public Engagement
7.	PE2020	Public Engagement
8.	BigPicnic	Public engagement
9.	RESPONSIBLE INDUSTRY	Governance (RRI unified approach)
10.	JERRI	Governance (RRI unified approach)
11.	FOTRIS	Governance(RRI unified approach)
12.	RECODE	Open Access
13.	MARIE	Governance (RRI unified approach) and S3

The table below depicts the projects that were selected to be included in the inventory. The ones highlighted in red colour are the ones that were after all analysed.



14.	Thinking Smart	Governance (RRI unified approach) and S3
15.	FIT4RRI	Open Science and RRI in general
16.	PROSO	Public Engagement
17.	SYNERGENE	Public Engagement
18.	NUCLEUS	Governance (RRI unified approach)
19.	RESPONSIBILITY	Governance (RRI unified approach)
20.	ENRICH	Science Education / RRI teaching

Table 1. The inventory of the 15 RRI projects that were analysed (and focus on RRI key/approach)



4. Analysis of Practices – RRI Inventory

This chapter represents the analysis of the 15 RRI projects and their correponding practices (43 in total). Within each project, the practices are analysed separately and are labeled through the following abbreviations: *P1* (Practice 1), *P2* (Practice 2), *P3* (Practice 3) etc.

4.1 EQUAL-IST - Gender Equality Plans for Information Sciences and Technology Research Institutions

Project summary: EQUAL-IST project aims at introducing structural changes in research organizations to enhance gender equality within ICT (Information and Communications Technology) institutions by creating a basis for increasing the share of Gender in IST research (e.g. by creating a crowdsourcing platform to promote a participatory approach and enable public discussion, or by implementing Gender Equality Plans in 7 IT partner institutions, amplifying Gender in education).

Number of innovation practices: 4

P1: Creation of National Mini reports

A1: Within the context of EQUAL-IST project, the first practice applied was the **creation of National Mini reports and engagement strategies**, in relation to the **RRI key of gender**. The practice was completed in M5. While the project was led by ViLabs (Greece), this practice was **undertaken by all the partner RPOS**;

- University of Muenster, School of Business and Economics
- University of Liechtenstein, Institute of Information Systems
- University of Turku, Institute of Information Systems Science
- Kaunas University of Technology, Faculty of Informatics
- University of Modena and Reggio Emilia, Department of Engineering 'Enzo Ferrari'
- University of Minho, Information Systems Department
- Simon Kuznets Kharkiv National University of Economics

A2: The **objective** of this practice was **the investigation of the national policy framework for gender equality in the countries of the RPOs**. Minireports had to present relevant and available existing information and documentation on policies, procedures, and practices related to gender (in)equality in the RPO countries.

A3: So as to perform the practice and deliver these national reports with a common high-level structure, within each RPO *GEPs Working Groups* were formed, which were defined as "the groups of people to be involved in the process impacting gender equality operations". Working groups collected data regarding the following aspects:



- National regulations and legislation on gender equality in a respective target country
- RPO statistics on the gender distribution among students and staff members
- **RPO initiatives for promoting gender equality** (Gender Equality Plans, policies, and programs)
- Other relevant gender equality issues (if found)
- RPO engagement strategy

A4: No information available.

A5: No information available.

A6: The impact of this practice was firstly related to the **internal ecosystem of each RPO**, since these reports were the **starting point to design the next stages of the project**, in other words the Gender Audit in each RPO and the actual Gender Equality Plans (GEPs).

Regarding the **impact outside the ecosystem of the RPOs**, the national mini reports functioned as **a means to reflect and "assess" the gender equality conditions in each country** and the corresponding **public deliverables can prove to be a valuable source of documentation** for each corresponding country.

P2: Gender Audit in RPOs

A1: Within the context of the EQUAL-IST project, the 6 RPOs proceeded, from February until end of April 2017 to **implement Participatory Gender Audits at their organizations**. The lead beneficiary of the practice was the University of Modena and Reggio Emilia (UNIMORE) in Modena, Italy.

A2: The gender audits were conducted **to get a complete picture based on existing available data of the internal situation of gender (in)equality in each IST/ICT Department Faculty**.

A3: During the gender audits, there was a first round of internal consultations by way of an audit, both with research purposes (collect information and assess perceptions, beliefs, resistances) and with action oriented goals (initiate a consensus building process about the more urgent challenges to be tackled, stimulate bottom up participation in collecting and discussing proposals, ideas and solutions).

There were two main approaches for gender audit: a quantitative approach to the problem, based on measurable indicators, and a qualitative approach, based on participatory techniques and tools.

Quantitative indicators are computed on gender disaggregated data; they provide measurable information that supports monitor and evaluation processes, and facilitate a comparison between:

- Different institutions (e.g., EQUAL-IST partner RPOs)
- Different geographical levels (local RPOs vs. national and European situation)

Participatory techniques and tools (i.e. the qualitative approach) make use of intense interactions with the staff of an organization to carry out a qualitative reflection on individual



and collective **rules**, **behaviors**, **and beliefs**, as well as their impact on gender equality; these techniques are essential because they allow the auditors to:

- Investigate areas where quantitative data are not available to analyze
- Probe staff's perception about gender (in)equalities
- Start a self-reflection process and promote learning about gender audit process and outcomes

The main components of the EQUAL-IST gender audit methodology (including both approaches) were:

1. Set of quantitative indicators

- a) Assessment of Gender Equality Degree amongst Students
- b) Assessment of Gender Equality Degree in Academic Staff
- c) Assessment of Gender Equality Degree in Non Academic Staff
- d) Assessment of Gender Equality in Governance
- e) Assessment of Work-life Balance Degree within the Institution
- f) Evaluation of Equal Opportunity Policies and Machineries
- g) Regional and National Gender Equality Indicators

2. Participatory tools

- a) Individual semi-structured interviews
- b) Workshops

The internal gender audit following the EQUAL-IST methodology was **carried out at each RPO** belonging to the EQUAL-IST consortium. Specifically, the **GEP Working Groups** (defined at P1) of each RPO were **responsible for conducting the internal gender audit**. To this purpose, the UniMORE research unit **trained** the RPOs Working Group members during the First Capacity Building Session, which took place in Venice on December 1 - 2, 2016. This **first Capacity Building Session** aimed at training the individuald conducting the audit process and presented the methodological guidelines for internal gender audit within IST-ICT research organizations. There was an additional session as well, the **second Capacity Building Session**, which supported the audit process itsel with discussions on the qualitative data collected.

A4: The gender audit methodology within the EQUAL-IST project was designed **according to already existing gender audit approaches and specific reference items**. In other words, there was a correlation with the **following gender approaches**:

- Manual for participatory gender audit of the ILO International Labour Office (ILO Manual, 2012)
- Guidelines and tools for institutional change Genis Lab FP7 Project (Genis Lab Project, 2014)
- GEAR Tool for gender equality in academia and research EIGE European Institute for Gender Equality (EIGE GEAR Toolkit, 2016)
- She Figures Handbook The main source of European, comparable statistics on the state of gender equality in research and innovation (She Figures Handbook, 2015)
- Assessment toolkit of the European FP7 INTEGER project (INTEGER Project, 2015)
- EURAXESS Initiative (EURAXESS, 2016)



A5: No information available.

A6: The impact of the Gender Audit process was mainly related to **the internal ecosystem of the RPOs**:

- This process offered the chance to **depict the current situation in terms of gender equality in each RPO**. This is a critical step to **identify gender bias** at the departmental and organizational level, and **advice accordingly the required measures** and actions for enhancing gender equality, something that can lead to internal change.
- Furthermore, the Gender Audit process contributed to the **realization of the following step/practice within the project**, in other words the development of the crowdsourcing platform "CrowdEquality".

P3: Creation of the crowdsourcing platform "CrowdEquality"

A1: The next practice applied within the context of the EQUAL-IST project, was the **creation of the crowdsourcing platform "CrowdEquality"**, in relation to the **RRI key of Gender**. The practice was completed in M10, and the lead beneficiary of this practice was the Westfälische Wilhelms-Universität Münster (WWU) in Germany, the Department of Information System.

A2: The rationale behind the crowdsourcing exercise was to collect ideas and trigger interesting discussions about the emerging challenges that were identified at each partner RPO during the internal audits.

A3: Regarding the development of the platform, it was hosted by the Department of Information Systems of the University of Münster (the Department). The Platform was developed by the team of eight Bachelor students studying Information Systems at the University of Münster as part of their project seminar in Winter Semester 2016/17. The Department academic staff members and system administration team performed Platform testing and improvement and ensured further Platform maintenance for the entire duration of the EQUAL-IST project.

In more details, the platform provided an opportunity for the 7 European universities implementing tailored GEPs within the EQUAL-IST project to collect, disseminate, and discuss the specific challenges related to gender equality that each RPO faces, as well as the promising initiatives to address each Challenge (Ideas). The Platform targeted at both Internal Users and External Users who had different contribution rights.

Internal Users included all members belonging to or closely collaborating with respective RPOs (students, academic and non-academic staff members etc.), as well as the members of the European Commission or the EQUAL-IST Advisory Board. External Users included the general public ("the crowd") not directly related to the RPOs or the EQUAL-IST project, e.g. policy makers, gender experts, members of relevant NGOs (Non-Governmental Organisations), national/international networks, as well as all individuals interested in the design and implementation of GEPs. Internal Users could submit Challenges and Ideas to the Platform, as well as leave comments to each Challenge/Idea and choose, whether it should be visible only to the other Internal Users (in the *private* area of the Platform, Internal Users could only 'Like' and leave comments on the content visible in the *shared* area of the Platform, as well as to vote for Ideas during the Voting phase (see below). Involvement of a wider audience ensured the crowdsourcing character of the Platform.



In order to facilitate the identification of the most suitable and feasible Ideas to be included into each tailored GEP, the crowdsourcing process follows **the Ideation**, **Review**, **Voting**, and **Implementation phases**;

- The goal of the **Ideation phase** was to **identify all existing Challenges and brainstorm** all possible Ideas addressing these Challenges.
- The goal of the **Review phase** was to **pre-select the feasible and promising Ideas** collected during the Ideation phase for the further Voting phase.
- The goal of the **Voting phase** was to **identify the winning ideas** that would be considered **for the inclusion in the GEPs** to be further implemented in practice.
- The goal of the Implementation phase was to preserve information about the winning Idea(s) for each Challenge, and to provide an area where each RPO could post updates about the implementation of the winning Ideas or sharing experiences if for any reason such implementation did not work.

There was also an opportunity for each Platform user (including those who were not logged-in) to get in contact with the Platform moderators at the Department using the **"Feedback"** section of the Platform. **Users could communicate the issues they had faced** or suggestions on how the Platform could be improved. The users were also asked to **rate their overall user experience** with the Platform. This feedback form was secured with the CAPTCHA test. All user feedback was then delivered to the Platform mailbox and further considered and addressed by the Platform moderators on a regular basis.

Finally, the Platform foresaw a non-monetary rewarding mechanism to motivate all its users to contribute to it. For each contribution (submission of an Idea or Challenge, commenting on or 'Liking' existing content etc.) a user received points displayed in the "Rankings" section of the Platform, which was accessible to logged-in users.

A4: No information available.

A5: No information available.

A6: The impact of the platform within the ecosystem of each RPO refered to the **facilitation of the participatory co-design of tailored GEPs** (during the crowdsourcing exercise 57 challenges were revealed, 111 ideas were introduced as solutions to the identified challenges). Concurrently, the creation of the crowdsourcing platform "CrowdEquality" had an impact outside the ecosystem of the RPOs. It managed to be to be an inclusive community that empowers men and women all over the world to freely discuss the issues of gender equality at research institutions. Consequently, the discussions emerging out of this are expected to encourage more females to advance their careers, to get involved in decision making and governance structures, to improve their working conditions and cultivate interest towards the IST sector.

This practice finally led to **the creation of the EQUAL-IST tooklit**, where one will find **selected inspirational examples to achieve gender equality in research organizations:** there are good practices and examples coming from ICT/IST Departments/Schools, but whereas this was not possible, there are also cases where the initiative was taken by central offices of the research institution. EQUAL-IST, therefore, targeted at a wider societal impact by increasing **the number of RPOs and RFOs implementing GEPs**, as well as **by increasing in the long term the number of female researchers** advancing their careers mobility, and, consequently, their



research intensity, by **improving the social value of innovations integrating the gender dimension in research programmes and content**.

P4: GEPs – Gender Equality Plans in IST – ICT Insitutions

A1: Within the EQUAL-IST project **6 GEPs – Gender Equality Plans were developped**, one for each project partner RPOs IST-ICT institution (WWU, UTU, KTU, UNIMORE, UMINHO, KHNUE). VILABS was the lead beneficiary for the development and the implementation of tailored GEPs. The first GEP implementation phase lasted from M16 till M24, while the second phase took place between M26-M36.

A2: The six RPOs developed these GEPs after carrying out extensive research activities in the context of EQUAL-IST project, **so as to**:

- enhance gender equality in their departments
- influence IST-ICT institutions outside the consortium at a later stage
- support ERA objectives in relation to gender equality in research (long-term objective)

A3: The six Gender Equality Plans (GEPs) may have been **tailored to each RPOs needs** and internal structures, but **followed the same design and methodology**. Firstly, the National mini reports were compiled (P1) and then there was the development and the implementation of a Gender Audit methodology (P2) combined with two Capacity Builiding Sessions. Finally, there was the creation of the platform "CrowdEquality" (P3).

After the results of the crowdsourcing exercises in the platform, all partner RPOs had to conduct meetings with the senior management actors at their departments/universities to initiate the process about the design of the strategic plans. Two sets of meetings were suggested, while at some cases a third meeting was also needed:

- **1st preliminary meeting** with the senior management actors for initial challenges and Ideas approval to have some initial discussions towards the measures that need to be taken for each RPO.
- **2nd meeting** with the senior management actors for initial GEP approval.
- **3rd meeting**, (if needed) to get the final approval.

During this period, the RPOs received help from UTU, from ViLabs and from UNIVE:

- UTU prepared the templates for the presentation of Ideas and Challenges to the senior management actors at each RPO along with guidelines for the partners.
- ViLabs was preparing the template for the formulation of GEPs in close cooperation with UNIVE.
- UNIVE prepared a toolkit with examples of good practices and concrete initiatives for IST-ICT institutions to facilitate the overall process of GEPs design and shared it with the Consortium.
- Finally, in order to complete the designing process of GEPs, the RPOs received individual consultation to develop the indicators for the evaluation of GEPs. The Gender expert of the consortium (University Ca'Foscary in Venice) in collaboration



with the University of Modena organised capacity building sessions to provide such consultation.

The following table depicts the **goals** for enhancing gender equality and the corresponding **actions** that were decided to be undertaken within each RPO **within the context of the Gender Equality Plans**. These actions were designed as "answers" to the specific challenges that were identified within each RPO.



RPO	Goals and Corresponding Actions of the GEPs
ols) any	Goal 1 - Increase the share of young women among Information Systems Bachelor students
Iniversity of Munster Department of Information Systems (DIS) WWU - Germany	 Goal 1 - Increase the share of young women among Information Systems Bachelor students. 1. Identification of the promising activities and communication channels to promote the Information Systems study programme (especially to young women). 2. Revision of existing marketing materials promoting the Information Systems study programme. 3. Promotion of the Information Systems study programme at existing interventions for female pupils. 4. Promotion of the Information Systems study programme at surrounding schools. 5. Improvement of the activities promoting the Information Systems study programme at the annual information days for secondary-school students. Goal 2 - Raise awareness about the topic of gender equality and interest in it. Goal 3 - Raise awareness about the goals and content of existing actions promoting women. 6. Raising awareness via marketing materials about the importance of gender equality and the value of gendersensitive language. 7. Improvement of communication of the content of existing actions promoting women and the reasons behind them.
	Goal 5 - Critically analyse existing actions promoting women and propose
	suggestions for their improvement.
	 Formulation of suggestions for improvement of existing regulations related to gender equality.
	Goal 6 - Enhance inclusion of international students.
	Development and implementation of a strategy for connecting international students with local students.
	Goal 7 - Improve work-family balance of academic staff members.
	 Improvement of communication of the expectations from academic staff members during the hiring process.
	 Development and implementation of a strategy for supporting staff members and students who have children.
	Goal 8 - Improve gender balance at higher academic ranks.
	academic careers.
	General Actions
	13. Dissemination of the Gender Equality Plan.
	 Development of the sustainability plan for all actions within the Gender Equality Plan.



aly	Goal 1: Improve the work-life balance of staff (academic and non-academic)
± ∣	1 Increase visibility of all information about leaves and work flevibility
RE	1. Increase visibility of all information about leaves and work nexibility
ę	regulation (e.g., teleworking).
- Lin	2. Feasibility study about the setting up of a child care service in the
))	university facilities.
ari	Goal 2: Discover and Promote Collaboration Among Existing Resources for
in en	Gender Equality
о Н	3. Competences and resources on gender equality in different
Enz	departments are communicated and given visibility.
ຸ ພ	4. Identification of a reference person for gender equality in each
erin	Department.
nee	Goal 3: Create a permanent monitoring system about gender equality
Jgi	5. Collection of gender disaggregated data and publication of statistics
Ē	about the ICT departments.
it o	6. Design of a system of gender indicators for monitoring and evaluation.
ner	Goal 4: Counteract gender stereotypes and gender segregation in ICT/IST
rtn	studies
pai	7. Inclusion of an educational module on gender equality and stereotypes
De	in the activities with the high schools.
ilia	8. Replication and extension of the ICT summer Camp "Digital Girls".
Ë	Goal 5: Empower young female researchers with dedicated networking and
io I	training activities
88	9. Organization of networking events and workshops for female
N N	researchers.
and	Goal 6: Improve the gender neutrality of the institutional communication
na	10. Guidelines for gender neutral communication at the institutional level.
qe	11. Seminars on gender neutral communication for UniMORE staff
δ	members.
of	Goal 7: Raise awareness about gender equality needs
ity	12. Identification and promotion of existing expertise and initiatives about
ers	gender dimensions in UniMORE.
vi	13. Organization of workshops and seminars on gender equality
2	
su	Goal 1: Support individual career development
ten	1. Creating individual career plans.
ŝyst	2. Set up peer support program in working unit.
5 7	3. Tutoring and encouraging all younger researchers to apply research
ntio	funds.
in in	4. Possibilities for Younger researchers to be leaders of projects.
ЪГ	5. Balance (the emotional labor) work between employees in ISS unit.
Ē	Goal 2: ISS as a gender-neutral unit
rku U	6. Support Institutional communication about equality.
Tu ISS	7. Promote both women and men in ICT field.
of it (8. More social activities for students in ISS.
Ľ Ľ	9. Give voice for females in ISS.
ersi	Goal 3: More Gender balanced staff
ien	10. Gender balanced recruiting.
N Sc	Ť

lia	Goal 1 – Create Mentoring Network for Women
Jar	 Involvement of female students to scientific Researches.
thu	2. Involvement of female students into teaching assistance and in informal
	education activities.
∍	3. Creation of Mentoring network of Research Professionals and PhD
Т	students.
ltγ	Goal 2 – Help Women to create their Career Roadmaps
ICU	4. Creation of a long-term Gender Sensitive Career Planning Template.
Ë	5. Adaptation of the Career Planning Template according the specifics of
tica	IT specialties
Ja	6 Individual Counselling and Monitoring to Women in designing their
.o.	Career Plans
<u></u>	Cool 2 To involve women to expenization decision making process by
gy	curnerting women leadershin
00	7 A workshop on Loadership development for Wemen
ц	7. A workshop on Leadership development for women.
Tec	Goal 4 – to present more good practices of women working in fr
of	8. A set of Weblinars for Girls.
ťζ	9. Organizing a special session women in ICT in International
ersi	Conference on Advanced Learning Technologies (ALTA).
ž	10. An organization of special session "Women in ICI" in International
5	Conference on Information and Software Technologies (ICIST).
Jas	11. Creation of social network for Women's Good Practice exchange.
aur	Goal 5 – to encourage men to stand for Gender Equality
¥	12. A workshop with experienced professors for IF students on Gender
	Equality (to encourage men to get involved with Gender Equality Issues)
	Equality (to encourage men to get involved with Gender Equality Issues)
ज्ञ ।	Equality (to encourage men to get involved with Gender Equality Issues) Goal 1: To achieve the periodic integration of considerations of diversity and
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University of Minho School of Engineering UMINHO – Portugal	 Goal 1: To achieve the periodic integration of considerations of diversity and gender equality in decision-making processes at all levels of University management, and in particular in the field of HR management 1. Diagnosis (so as to support and implement diagnosis to the situation of men and women in the institution). 2. Workshop (scientific and technical events on a bi-annual basis). 3. Meetings (meeting with Rectory, Organics Units and Commission for Citizenship and Gender Equality / CIG). 4. Book of life stories (documenting the experiences of the various organizational protagonists regarding their successful approaches to overcome gender inequalities). 5. Code of Conduct (for diversity and gender equality). 6. Awareness raising and support. Goal 2: To increase the recognition of Gender Equality Projects / Publications in organic sub-units 7. Meeting with Research Centers. Goal 3: To achieve higher levels of Gender Parity in Research Groups and Projects 8. Participation in the General Assembly of Research Centers. Goal 4: To promote the involvement with the EURAXEES initiative and network on gender equality and diversity
University of Minho School of Engineering UMINHO – Portugal	 Goal 1: To achieve the periodic integration of considerations of diversity and gender equality in decision-making processes at all levels of University management, and in particular in the field of HR management 1. Diagnosis (so as to support and implement diagnosis to the situation of men and women in the institution). 2. Workshop (scientific and technical events on a bi-annual basis). 3. Meetings (meeting with Rectory, Organics Units and Commission for Citizenship and Gender Equality / CIG). 4. Book of life stories (documenting the experiences of the various organizational protagonists regarding their successful approaches to overcome gender inequalities). 5. Code of Conduct (for diversity and gender equality Projects / Publications in organic sub-units 7. Meeting with Research Centers. Goal 3: To achieve higher levels of Gender Parity in Research Groups and Projects 8. Participation in the General Assembly of Research Centers. Goal 4: To promote the involvement with the EURAXEES initiative and network on gender equality and diversity 9. Meeting with Vice Dean for Research



	Goal 5: To achieve a greater gender balance in the various University's study				
	programs and in particular the STEIVI ones				
	10. Internal Event for High School Students, Visit to the secondary schools.				
	11. Participation in the Government Project (CIG) "[Female] Engineers for				
	one day" in the secondary schools.				
	Goal 6: To engage faculty and students in the discussion of gender equality				
	practices				
	12. Meeting with Pedagogical Council and Programme directors (1st. 2nd				
	and 3rd cycles)				
	13 Gender Mainstreaming Observatory (with publications/projects about				
	sonder equality and diversity)				
	genuer equality and diversity).				
	14. Scientific Events Report (on the number of invited male and remaie				
	speakers).				
	Goal 7: To implement an effective communication policy that covers the				
	various dimensions – teaching, research and management				
	15. Gender sensitive language protocol.				
	Goal 8: To promote genderless description of study programs and				
	dissemination materials				
	16. Meeting with Communication, Information and Image Office (for				
	stimulating gender equality attitudes).				
<u>ہ</u> ب	Goal 1 - Improve work-life balance of staff and students				
en	1 Implement provisions for ensuring priority when drawing up the				
tm kra	schedule of classes for academic staff having young children children				
- C a	with disabilities large families for program women				
Je –	With disabilities, large families, for pregnant women.				
l sr UN	2. Carry out research on determining the need and resources for opening				
kh Kh	a children's room on campus.				
yst ics	3. Implement provisions for ensuring teleworking for academic staff				
s no	having young children, children with disabilities, large families, or for				
ono	pregnant women.				
Ec	4. Promote a culture of equal family responsibilities among students and				
of	staff.				
Ξ	5. Create and support a section on the University website (and / or				
ity	Intranet) with information on gender equality issues, work-life balance				
ers	rights, provisions and regulations.				
лi У	Goal 2 - Encourage the achievement of gender equality (vertical principle)				
2	through information and awareness raising activities				
na	6. Conduct seminars and round tables on gender equality for				
itio	administrative staff.				
Ra	7. Make recruitment procedures and selection criteria transparent.				
kiv	Goal 3 - Encourage the achievement of gender equality (horizontal principle)				
Jar	through information and awareness raising activities				
Conduct information and awareness raising activities					
ets	ocuality iscues for stoff				
uzr	Cool 4. Encure cuctoinability of CED's actions by actabilishing gander actuality				
Ϋ́Υ	Goal 4 - Ensure sustainability of GEP's actions by establishing gender equality				
uo	machineries				
nin	9. Establish a Commission on Gender Equality Issues and develop				
S	mechanisms for its functioning.				

Goal 5: Ensure sustainability of GEP's actions by including gender equality		
goals and measures in the University strategic documents		
10. Ensure the support of certain provisions of European Charter for		
Researchers by University staff.		
11. Propose and implement changes to existing Collective Agreement of		
University Administration and Trade Union Committee in order to		
insure the implementation of GEP.		
Goal 6: Make decision-making bodies informed and committed to the		
principles of gender equality		
12. Collect, analyse and publish gender disaggregated statistics of the University.		
Goal 7: Raise awareness about gender equality issues, develop gender culture		
of academic staff and students		
13. Conduct information and awareness raising activities on gender		
equality issues for students and academic staff.		
14. Develop and disseminate printed and electronic awareness raising		
materials on gender equality.		
Goal 8: Adopt a gender approach in specific teaching material		
15. Perform pilot anti-discriminatory expert assessment of teaching		
materials.		
Goal 9: Improve gender balance among students of computer and economy		
sciences		
16. Conduct awareness raising events to spread information about women		
in IT industry and women's career opportunities in IT.		
17. Establish special nominations for women / female teams in existing IT		
championships and competitions.		
18. Perform pilot anti-discriminatory expert assessment of marketing and		
advertising materials for IT Bachelor's and Master's programs.		
Goal 10: Raise awareness about the value of gender sensitive/gender neutral		
communication		
19. Provide language and visual support for gender equality in the media		
content of the University.		
·		

Table 2. Actions undertaken within the GEPs (P4) OF EQUAL-IST

A4: By the end of the project, there has been an **interrelation with the EIGE – European Institute of Gender Equality and the GEAR tool**. According to the promoters of the EQUAL-IST practices, the EC was provided with useful information collected during the GEPs and the completed results so as to make it available through the GEAR tool.

A5: In each RPO and corresponding GEP (Gender Equality Plan), **different barriers/obstacles** were recognized;

• These were mainly related to the existing conditions or beliefs about gender equality within each RPO, and were characterized as the *challenges* that had to be addressed by specific goals and actions (these were not immediately related to the implementation of the GEPs, but they were the obstacles in the thematic sphere of gender equality, out of which the GEPs emerged) (Table 3).



• While implementing the GEPs, **RPOs faced resistances from the personnel** (administrative and professors) to spend additional efforts for tasks about gender equality balance (e.g. collect data from previous years, organise awareness raising campaigns and events).

RPO	Obstacles/Challenges		
University of Munster <i>Department of</i> Information Systems (DIS) WWU - Germany	 Low share of young women among Information Systems Bachelor students. Lack of awareness about the topic of gender equality and interest in it. Lack of seeing value in gender-sensitive language Negative attitude (of both men and women) towards existing actions promoting women. Perceived exclusion of international students. Difficulties in balancing work and family life. Vertical gender segregation. 		
University of Modena and Reggio Emilia <i>Department of Engineering</i> <i>'Enzo Ferrari'</i> UniMORE – Italy	 Both academic and non-academic staff struggle to achieve work-life balance, especially with young children. Scarcity of resources and coordination for committees on gender equality. Absence of long term monitoring for gender equality. Gender stereotypes about ICT/IST studies and lack of female role models. Low presence of women as leaders of research groups and project principal investigators. Lack of gender neutral communication. Awareness about gender equality issues to be raised at all levels within the university. 		
University of Turku Information Systems Science Unit (ISS) UTU – Finland	 Lack of female professors. Questions on how to endorse peer support between employees to ensure gender equality. Need for female voice for ISS. Female ISS students feel lack of belonging to the ISS community, as they are the minority in ISS. Emotional labor falls to nice staff, often women. 		



Kaunas University of Technology <i>Informatics Facult</i> y KTU – Lithuania	 Lack of support to female students at KTU to retain them into ICT academic careers. Women struggle in creating a clear career vision. Women are not involved into decision making at the Faculty. The lack of visibility of women in IT. Lack of men involved in Gender Equality Actions.
University of Minho <i>School of Engineering</i> UMINHO – Portugal	 Gender Equality Reflexivity and Awareness at the University. Institutionalization of Gender Equality as a guiding principle of the University's mission and strategy. Lack of physical structures and services to support Gender Equality practices and the Conciliation of Life Demands. Recognize, encourage and fairly evaluate Projects / Publications on Gender Equality in the various teaching and research organic subunits. Encouragement of Gender Diversity in Groups and Research Projects. Gender inequality in Study Programs. Gender inequalities in the labor market. Lack of an effective communication policy covering the various dimensions of academic life (teaching, research and management. Lack of concern for language issues in the description of study programs and their dissemination in the media.
Simon Kuznets Kharkiv National University <i>Information Systems</i> <i>Department of Economics</i> KhNUE – Ukraine	 "Work-life balance" problem and lack of facilities for the balance support. "Glass ceiling" problem (vertical segregation). Concentration of female staff in certain women's sectors of employment (horizontal segregation). Lack of gender equality machineries. Gender issue is not in focus in decision-making process. Lack of gender culture and awareness about gender equality issues. Gender imbalance among students of computer sciences and economy sciences. Gender insensitive communications.

Table 3. Barriers/obstacles in the GEPs (P4) of EQUAL-ST

A6: All the GEPs had an **impact inside the ecosystem of the RPOs** that applied them, and more specifically **in three levels**;

- 1. HR practices and management processes
- 2. research design and delivery
- 3. student services and institutional communication

It is expected that the **GEPs will trigger new knowledge and permanent institutional changes in the RPOs** by increasing, for instance, the number of female researchers, by



ameliorating their career mobility and research activity. According to the promoters of the EQUAL-IST practices, they have started collecting data to identify the institutional improvement, and one of the RFPOs' priority has been to take actions in order to secure that the GEP improvements will continue after the project completion, e.g. receiving confirmation by the rectors, high managment levels, etc.

When it comes to the **wider, societal impact outside the ecosystem**, it is expected that:

• the applied GEPs will contribute to the achievement of the ERA objectives by integrating the aspect of gender equality in research procedures and content, and by increasing in the long-term the number of female researchers.



4.2 CREATIONS - Developing an Engaging Science Classroom

Project Summary: CREATIONS aims to demonstrate innovative approaches and activities that involve teachers and students in Scientific Research through creative ways, and focuses on developing effective links and synergies between schools and research infrastructures in order to spark young people's interest in science and in following scientific careers. The policy development focuses, among others, on demonstrating effective community building between researchers, teachers and students, on demonstrating effective integration of science education with infrastructures through monitored-for-impact innovative activities which will provide feedback for the take-up of such interventions at large scale in Europe, and on documenting the whole process through the development of a roadmap that will include relevant guidelines

Number of innovation practices: 2

P1: Utilising existing research infrastructures of frontier research institutions enriched with online tools

A1: Within the context of CREATIONS project (led by the University of Bayreuth, Germany), the first practice applied during the first fifteen months was to utilise existing research infrastructures of frontier research institutions enriched with online tools. This practice was related to the RRI key of Science Education.

A2: This practice was promoted so as to:"

- offer to students the opportunity to interact with the research culture that has been developed in big research infrastructures such as CERN and its experimental facilities (the short-term objective).
- to contribute to the formulation of the pedagogical framework of the CREATIONS project, based on the interaction mentioned above and the principles of RRI (the long-term objective). In general terms, this pedagogical framework supported innovative teaching experiences that enhance creativity as a generic element in the processual and communicative aspect of the pedagogy by integrating culture and arts in science education.

A3: So as to utilise the existing research infrastructure of research institutions (enriched with online tools), there was a series of different initiatives. For example, **a pool of activities provided access to CERN infrastructures**, with which the project partners have been developing and testing for many years innovative applications. These **applications** promote:

- creative problem solving
- discovery
- learning by doing
- experiential learning
- critical thinking
- creativity
- simulation of the real scientific work.

A4: As already mentioned, within this practice there was **a synergy with CERN**, so as to utilise its existing research infrastructure.

A5: No information available.

A6: The **immediate impact** of this practice was **learners' engagement to creative learning** including:

- exploration
- dynamics of discovery
- student-led activity
- engagement in scientifically oriented questions
- priority to evidence in responding to questions
- formulations of evidence-based explanations
- connection of explanations to scientific knowledge or justification of explanations

This can be seen as **impact inside the ecosystem**, since the above opportunities were offered to students belonging to organisations/institutions participating in the project.

Furthermore, this practice led the to the production of the initial 20 CREATIONS **Demonstrators** and to development of the CREATIONS pedagogical framework. This can be seen as impact within the ecosystem as well, since the 20 Demonstrators were the following practice (P2) within the context of CREATIONS project (P1 was the necessary 'step' for proceeding to P2).

P2: Development of the CREATIONS Demonstrators

A1: The CREATIONS Demonstrators were related to **the RRI key of Science Education** and were **detailed examples of activities introducing learners to the world of science**. The initial 20 Demonstrators were developed during the first fifteen months of the project. Generally, all Demonstrators were implemented with students **in a variety of settings**, providing them with creative learning experiences inside and outside the school classroom.

A2: The Demonstrators were developed so as to:

- Introduce learners to various aspects of the scientific world, and function as guidelines for anyone who would wish to implement the CREATIONS features into their own setting
- Facilitate the development of the CREATIONS pedagogical framework.

A3: For compiling and documenting all the Demontrators, a community support environment was developed aiming to build virtual communities of users who can share educational content and practice. This was the CREATIONS portal.

During the first 15 months of the project, 2000 unique users visited the CREATIONS portal, 467 of whom were registered and provided 357 educational resources. Educators also had to be trained so as to apply the activities in practice; **500 teachers participated in a series of training events and workshops**. Finally, **600 teachers with 6000 students took part in the implementation of the initial CREATIONS Demonstrators** by 11 partners in 8 countries, at a



local, national and international level in a variety of settings, spanning from the school classroom to science centres, research centres, exhibitions and others, and varying in time from a few school hours to months accordingly. **2000 students provided feedback for the validation of the project's activities** in a pre- and post- fashion, indicating an overall satisfaction with the project's approach and an increase in their creativity and interest in STEM after the completion of the activities they had participated in.

Behind the **creation of these virtual communities**, one can find **teachers**, **students**, **artists and researcher**s that are part of a professional network to encourage interaction and opportunities to enrich practices and professional context.

Finally, in the table below one can find **the list of all the 107 Demonstrators** that were developed within CREATIONS (the name of the Demonstrator and the related subject domain or scientific field). In <u>Deliverable D3.2</u>, there is also a detailed analysis of the methodology applied for the execution of each Demonstrator - teaching activity aiming at learners' engagement in science.

No	Name of Demonstrator activity	Subject domain or Scientific field
1.	Out-of-school learning in the zoo	Bionics
2.	Simply inGEN(E)ious! Creative modelling of DNA-structure in an outreach bio-/gene technology lab	Biology and Chemistry
3.	Archaeopteryx and bird flight- why do birds fly?	Biology and Physics
4.	FutureForest – combining creativity with biodiversity education	Sustainable Development, Environmental Learning and Biology
5.	Creative modelling of a nerve cell	Biology
6.	Strategies of Waste Prevention and Resource Management	Biology and Chemistry
7.	Science & Art@School	Particle Physics, Physics
8.	CMS Virtual Visits	Particle Physics, Physics
9.	From Microcosm to Macrocosm	Particle Physics, Physics, Astrophysics, Cosmology, Engineering, Technology
10.	Adventures of a Ferret at CERN	Particle Physics, Physics, Astrophysics, Cosmology, History of Science, Engineering, Technology, Computer Programming
11.	5I&3D in PWP: A science education that has meaning and significance for pupils' lives	Physics, Particle Physics, Astronomy, Cosmology, History and Philosophy of science, scientific literacy
12.	Playing with Protons	Particle Physics, Physics, Astrophysics, Cosmology, History of Science, Engineering, Technology
13.	Icarian cosmonauts travelling in science	Particle Physics, Cosmology, Gravity, Astronomy, CERN


14.	Playing with Physics	Particle Physics, Physics, Astrophysics, Cosmology, History of Science, Engineering, Technology, Art and
		Physics
15.	A cloud full of knowledge travels to schools and libraries. Cloud Chamber Workshop	Particle Physics, Physics, STEM, Arts
16.	Art & Science across Italy	Particle Physics, Physics
17.	CERNgineers: Creative engineering in the search of Universe's structure	Particle physics, physics, engineering, STEM
18.	Cultural Collisions at CERN	Art and High Energy Physics at CERN
19.	Artful Physics	Physics (particle and nuclear)
20.	WILD, Science Art Ocean	Science / Arts
21.	PSCA-Inquiry Through Science & Art	Science / Arts
22.	Inquiry based Visual Projects using Photography	Science (any science topic, in this case magnetic fields; chemical reactions; sound) and Photography
23.	Shoal of Fish	Biology/Visual Art
24.	Lise Meitner: The battle for ultimate truth	Nuclear fission in Physics, Standard form in Mathematics
25.	Action Research Project at Exeter University	Science, The Arts, Teacher Development and accompanying student science engagement, Action Research (AR)
26.	Masterclass at Exeter University	Physics , Light Photography
27.	Understanding Big Ideas in Science and Art (UBISA)	Science (Biology, Chemistry, Physics, Earth Science)/Visual Art
28.	Student Parliaments	Biology, Engineering, Technology (The Future of the Human Being)
29.	Learning Science Through Theatre	Mathematics, Physics, Chemistry, Biology
30.	Inquiring the Ghost particles	Physics, Arts
31.	Engineering a bridge	Science, Technology, Engineering, Art, Mathematics
32.	Creative colors of climate change: Cool colors sign the dangers & Warm colors suggest solutions	Science, Technology, Engineering, Mathematics
33.	Mathematical Tour on Art Math Stories in Museums -Math Stories in Museums	Mathematical, STEM, Art with digital tools
34.	"Multi – maker" Scientific Event	STEM (Mathematics, Physics, Chemistry, Biology etc.)
35.	Mathematical tour on Art	Geometry, Art
36.	Edutainment in everyday life	Multi disciplinary – Physics, Chemistry, Biology, Mathematics, Astronomy (General STEM)
37.	GSOrt (Global Science Opera in real time)	Physics, Mathematics
38.	Creations Summer School	Astroparticle physics, History of the Universe



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39.	The Sound of the Earth	Geology\ Earthquakes\ Earthquake, Detection Music\ Sonification of experimental data
40.	The ALICE Experiment @ CERN	High Energy Physics at CERN
41.	Einstein Meets Creativity	Physics\ Theory of Relativity\ Mass- Energy Equivalence and applications
42.	The LHC Tunnel	High Energy Physics at CERN
43.	Global Science Opera (GSO)	Particle Physics (Particles Photon, Neutrino and Higgs boson)
44.	Write a Science Opera (WASO)	all areas of STEM, a multi-disciplinary approach to arts (visual arts, music, drama, lighting design etc.)
45.	Art@Creations	Music, computer animation and science
46.	HVL- ARTig Demonsrator	Biology/ the study of species
47.	Atoms & Molecules at Rubbestadneset	Atoms & Molecules (Phenomena and substances)
48.	Equivalent Fractions!	Fraction education in the Norwegian secondary school
49.	Moon Village	Astronomy
50.	Sustainable Design – Ecoscenography and Creativity in the Global Science Opera	Sustainability, Eco-systems (oceans)
51.	Tjødnalio Community Culture Weeks: Astronomy	Astronomy education (related to 1st through 7th grade of Norwegian primary schools)
52.	HYPATIA an online tool for visualization and discoveries using elementary particle collisions	High Energy Physics at CERN
53.	Let's Accelerate Particles: learn about the LHC accelerator by playing a game	Motion of particles in electric and magnetic fields, acceleration of particles, High Energy Physics at CERN
54.	The structure of the Atom	Physics (and the significance of subatomic physics in science and in everyday life)
55.	The Magnetic Field and its applications	Physics
56.	Demonstrator of how LHC works - Let's Accelerate Particles: learn about the LHC accelerator by playing a game	Motion of particles in electric and magnetic fields, acceleration of particles, High Energy Physics at CERN
57.	Particle Physics Masterclass	Particle Physics
58.	Crater Investigation	Physics, Art
59.	Dark Matter Particles Investigation	Physics, Art
60.	Exploring Exoplanets	Astronomy and astrophysics, Art
61.	Shadow Puppets	Physics, Theatre education
62.	Serendipity –Accidental Discoveries in Science	Science, Technology, Engineering, and Mathematics (along with art/skills education with drama pedagogy tools)
63.	"Art of Math Exhibition"	Mathematics, Art, Science



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64.	"4-D Math and Art Workshop"	Mathematics, Art, Science,
		Technology, Engineering
65.	AR Memory Game	Physics, Biology, and others
66.	Planetary Evolution	Geology, Physics, Astronomy
67.	Text Adventure Game	Physics, Biology, Chemistry and other scientific domains
68.	Particle Physics Workshop	Particle Physics, Creative Design of Particles
69.	Particle Physics Masterclass	Particle Physics
70.	Particle Physics Masterclass (extension)	Particle Physics
71.	Clocks and Gears	How mechanical clocks use gears to control the speed of movement of the hands
72.	Neutrino Passoire	Particle Physics
73.	Fine Arts Workshop	Particle Physics
74.	STEAM summer school	STEAM summer school — create the next generation of science communicators in Malta
75.	Classification Game	Biology
76.	CO2 Play	Chemistry and Physics
77.	Imploding Can	Physics
78.	Plastic Ocean	Chemistry, Biology and Environmental Science
79.	Probability Pyramid	Mathematics
80.	Pythagoras' Mountain	Mathematics
81.	Snap a Scientist	various
82.	STEM Escape Rooms	can be adapted to any subject
83.	The Ozone Game	Chemistry
84.	Visible DNA	Biology
85.	May Month of Mathematics (M3)	Mathematics
86.	SORTING DANCE - connecting programming and art by dancing activities	Programming, sorting algorithms
87.	Build Your Own City	Mathematics, Architecture
88.	DRAGON CURVE - connecting math and art in classroom by teaching fractals	Fractals, Mathematics
89.	PEER FORCE – Peer learning with audience interaction	Physics, Mathematics, Chemistry and Biology (but also applicable to all sciences)
90.	SCIENCE ART SHOW – Concentrate on details	3d modeling (but also applicable to all sciences)
91.	Science fiction - STEAM motivation	applicable to natural sciences such as chemistry, physics, electronics, engineering (but depending on individual products during project



		phases, any science can be represented)
92.	Science Pantomime	Physics, Mathematics, Chemistry, Biology, Geography (applicable to all natural sciences)
93.	TBVT show	Physics, Biology, Chemistry, Arts
94.	Science monologue national contest	Science (STEM) and Arts
95.	Science on stage Workshop for Teachers	teachers learn how to communicate science on stage
96.	Science on stage Workshop	students learn how to communicate science on stage
97.	Science on Youtube Workshop	Exploration of the deepest secrets of nature through Youtube videos
98.	Science youtube video international contest	Science (STEM) and arts
99.	Aspects of Venus	Astronomy, Physics, Chemistry, Maths, Arts, Language
100.	Astronomy Day and Night at Vetenskapens Hus	Astronomy, Physics, Technology, Arts
101.	Features of the Sun	Astronomy, Physics, Chemistry, Maths, Arts, Language
102.	Stockholm Pi-day	Mathematics, Arts
103.	Skygazer	Astronomy, Physics, Arts, Language
104.	Stockholm Master classes in particle physics	Particle physics
105.	Technology Eight 2017 Stockholm – class project	Technology, Engineering, Design, Arts, Language
106.	Science Talks	Physics, Quantum Electronics and Optics, Photonics
107.	Water in art and science	Science and Visual Arts

Table 4. Demontrators / teaching activities developen within CREATIONS

A4: As mentioned in A3, so as to design and implement all these Demonstrators, there was a **collaboration among various teachers, students, artists and researchers** (through the CREATIONS portal).

A5: No information available.

A6: The CREATIONS Demontrators had at first **an impact within the ecosystem** of the organisations/institutions participating in the project:

• The students and the teachers participating experienced a trully engaging science classroom (especially young students could experience an active and playful role in science and research).

With respect to the **impact outside the ecosystem**, the following were achieved:

• In order to create all the Demonstrators, a pan European network of students, teachers, researchers and artists was established, as well as a comprehensive open



learning network where teachers could access their colleagues' course materials. This aspect, combined with the fact that the CREATIONS selected and proposed activities were implemented at a large scale in Europe and beyond, points to **a broad knowledge transfer**.

- A new kind of "taxonomy" of teaching activities based on learners' acceptance and based on the activities' efficiency for intorducing learners into the scientific world; all the Demonstrators implementations and the training activities were systematically monitored and validated (students provided feedback for the validation of the project's activities as mentioned in A3). This ensured rapid impact and widespread uptake.
- The CREATIONS approach and framework were created, accompanied by a systematic raising awareness strategy; a common set of guidelines and recommendations for the scientific work emerged, and provided an engaging educational experience through the exploration of "real science" with "art as catalyst". In this way, a better understanding of science and the role that it plays in society and for the society was encouraged.



4.3 FIT4RRI - Fostering Improved Training Tools For Responsible **Research and Innovation**

Project summary: FIT4RRI contributes to bridging the gap between the potential role RRI and Open Science (OS) could play in helping Research Funding and Performing Organisations (RFPOs) to manage the rapid transformation processes affecting science. Variable strategies are promoted so as to activate institutional change in the RFPOs.

Number of practices: 3

P1: Extensive literature review and analysis of RRI (Responsible Research and Innovation) and OS (Open Science)

A1: Within the context of the FIT4RRI project (led by the Sapienza University of Rome, Italy), the first practice applied was compiling an extensive literature review combined with an analysis, and focusing on five levels:

- **General trends**
- **Barriers to RRI and OS**
- **Drivers to RRI and OS**
- **Interests & values**
- Advanced experiences

The practice was applied during WP1 (led by K&I, Italy) and WP2 (led by MUSTS-Maastricht University, The Netherlands). There was not a focus on a specific RRI key, but rather an RRI unified and holistic approach.

A2: The **objective** of this practice was:

- to develop a map of critical issues for the embedment of RRI and OS in RFPOs
- to develop a framework on the institutional integration of RRI and OS.

A3: As this practice was applied during two different WPs, there was a different methodology in each WP.

≻ WP1

The process of **compiling the literature review** and creating the map of critical issues related to RRI and OS was separated in three stages. In general terms, the aspects taken under consideration were trends, barriers, drivers, interests and values in Science and Innovation (and how they are connected to RRI).

1. In the first stage, there was an analysis of the changes affecting science. This analysis included two sections:





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- <u>1st section</u>: a summary of the **theoretical approaches** that could interpret the **transformation processes taking place in Science and Innovation**
- <u>2nd section</u>: an inventory of the actual changes/transformation processes occuring in Science and Innovation
- 2. In the second stage, the focus was on RRI and included two sections:
 - <u>1st section</u>: theoretical approaches to RRI (main theories, features and structures)
 - <u>2nd section</u>: the analysis of **RRI** in action through the examination of barriers and drivers, based on the content of academic journals and on the content of literature produced within the context of EC-funded projects (related to RRI)
- 3. In the third stage, a connection was created among the results/outputs of the previous parts, so as to facilitate the following steps of FIT4RRI. It included three sections:
 - <u>1st section:</u> a summary of the main issues
 - <u>2nd section</u>: open questions on the limited integration of RRI into the European systems
 - <u>3rd section:</u> a preliminary framework for the experiments

Therefore, the literature review finally included six different components:

- 1. the shift from modern to post-modern society
- 2. the theoretical models developed to account for the many changes affecting science and innovation in the last decades
- 3. the main change processes affecting science
- 4. the theoretical approaches to RRI
- 5. analysis of the deliverables produced under EC-funded projects dealing with RRI
- 6. a literature review of scientific articles on drivers and barriers related to RRI

> WP2

In this WP, the methodology was developed through the attempt to **answer two keyquestions;** <u>How do RRI-related dynamics vary across sectors, national contexts and other</u> <u>contextual factors</u>? and <u>How to understand the level of variability and the factors producing</u> <u>such a variability?</u>

So as to answer these questions, a **literature review** was compiled and **workshops** were conducted in five different countries (Italy, Norway, Greece, The Netherlands, Portugal). Both the literature review and the workshops **focused on five levels**; *trends, barriers, drivers, interests, values* and *successful experiences* in Science and Innovation (and how they are connected to RRI). They also focused on five sectors:

- 1. Sustainable energy use
- 2. Materials science
- 3. Information and communication technologies
- 4. Biotechnology
- 5. Photonics.

A4: No information available.

A5: No information available.





A6: This practice had a considerable impact:

- It provided input for the experiments to be conducted at a later stage of the project, as well as necessary insights for assessing the future RRI and OS-related training tools (impact inside the ecosystem of the RFPOs). It should also be highlighted that, according to the promoters of the FIT4RRI practices, collecting all these RRI practices that enabled the experiment organizers to better implement their experiments, was seen as the main innovation in terms of RRI theory per se.
- There was an increase in general knowledge on RRI and OS practices by sharing experience across different disciplines (impact outside the ecosystem of the RFPOs).

P2: 4 co-creation experiments

A1: The second practice within the context of FIT4RRI takes place during WP3. The co-creation experiments test some of the main outputs that emerged out of the analytical procedures of the previous practice, and observe RRI and Open Science in action by institutionally embedding RRI and OS approaches in four different RFPOs. In general terms, all the FIT4RRI experiments are considered as an exercise of engaging the quadruple helix (university, industry, policy makers, society) into the implementation of research activities, so as to further comprehend how institutions can change their organisational structures for integrating RRI and further enhancing the quadruplr helix actor. The experiments are the following:

- Experiment 1 on Energy (ISQ Group, Portugal)
- Experiment 2 on Photometry (Photonics-Optical Monitoring) (University of Liverpool, UK)
- Experiment 3 on Material Science (University of Italy, Rome)
- Experiment 4 on Text and Data Mining (Open University, UK)

It should be mentioned that one of the experiments (Experiment 3, University of Italy) had certain links with S3, since it focused on promoting aspects that were supported by the RIS strategy of that region (e.g. science, STEM and additive manufacturing).

A2: These experiments were designed in order to:

- test in different RFPOs advanced governance settings and training tools that can favour RRI and Open Science approaches and tools (especially in relation to hard sciences).
- trigger institutional changes and a new 'culture' within the RFPOs, which is shaped under the principles of RRI, Open Science and the Quadruple Helix model (a more long-term objective).

A3: After the completed **implementation of the experiments**, more information are going to be reported publicly. At this point, **methodological procedures (strategies/policies) that have been**, or are currently being applied are described separately for each RFPO and corresponding experiment in the table below.



RFPO/Experiment	Methodological procedures
ISQ Group - Energy	 The ISQ experiment focuses on the RRI keys of <i>Open Access</i> and <i>Governance</i>. Specific procedures underlie this experiment: Empowering ISQ researchers on RRI. Creating a Roadmap with recommendations on how to include the society (to include the quadruple helix) for ISQ's R&D activity. Developing an RRI model for ISQ and a strategic plan to implement it.
University of Liverpool - Photometry	 This experiment focuses on the RRI keys of <i>Ethics</i> and <i>Science Education</i>. Specific procedures underlie this experiment: The basis of the experiment is a monitoring system for health and social care applications. In more details, it is an optical monitoring healthcare system that will be placed in the living space of vulnerable people in residential care homes to monitor patterns in behaviour through movement. The monitoring system will help people stay safe in their living environments and help care workers to deliver quality care through the prevention of falls. There will be an extensive collaboration with stakeholders so as to change the way ethics and science education are viewed today (e.g. in institutions, by society etc.).
University of Italy – Material Science	 This experiment focuses on the RRI keys of <i>Governance, Public Engagement</i> and <i>Science</i> Education. Specific procedures underlie this experiment: A new research center is going to be created, for strengthening the university's capacity of generating social impact & value. The experiment will proceed along with another ongoing project (Saperi&Co) and therefore the central physical R&I infrastructure that emerged out of Saperi&Co will be exploited; a fab-lab, cow-working spaces, a training room and 4 labs based on regional S3.

Open University – Text and Data Mining	 This experiment focuses on the RRI keys of <i>Open Access</i> and <i>Open Science</i>. Specific procedures underlie this experiment: The experiment is based on previous work conducted by the Open University; the creation of the machine accessibility of the Hybrid Gold Open Access publications for text and data mining purposes. Within the context of the experiment, the machine will be extended to open access publications; there will be an extended collaboration with publishers so as to offer to text miners this massive closed access corpus of publications for text mining purposes. Publishers' machine interface to closed access publications will be investigated. Focus groups will be created. Discussions will take place, related to the legality of text mining of closed access resources, to the security and prevention of unauthorised use of copyrighted materials, and to the traceability of usage and monitoring (who benefits and uses TDM).

Table 5. Methodological procedures for the FIT4RRI experiments

A4: Within each experiment, different **synergies** took place and **different correlations** existed (e.g. with previous projects).

- <u>Experiment 1 on Energy (ISQ Group, Portugal)</u>: It is mentioned that during the experiment **stakeholder engagement** takes place.
- Experiment 2 on Photometry (Photonics-Optical Monitoring) (University of Liverpool, <u>UK)</u>: It is mentioned that, in order to change the way ethics and science education are being viewed, there is a **collaboration with external stakeholders and with various institutions**.
- Experiment 3 on Material Science (University of Italy, Rome): This experiment has been planned based on and in continuity with a previous project, Saperi&Co. There is a considerable correlation between the two projects, since the FIT4RRI experiment employs the infrastructure that was created within the context of Saperi&Co (a fablab, cow-working spaces, a training room and 4 labs based on regional S3).
- Experiment 4 on Text and Data Mining (Open University, UK): The work performed in this experiment is related to previous work conducted by the Open University, in other words to the investigation of the machine accessibility of the Hybrid Gold Open Access publications for text and data mining purposes. Within the FIT4RRI experiment, this work is extended in relation to open access publications.

What is more, in this experiment even **competitive partners (industry) were engaged in the experiments**, as they had discovered mutual benefits (without endangering their competitive advantage).

A5: Besides the usual barriers encountered (resistance to change, resources, lack of information), according to the promoters of the FIT4RRI practices **the main barrier resided in showing a clear ROI / benefit from RRI.**



A6: The expected **impact** of the experiments is related to:

- Bringing upcoming institutional changes within the RFPOS (impact inside the ecosystem);
 - 1. Introduction of mandatory RRI training to new staff
 - 2. Infusion of RRI concepts to new EU funded projects
 - 3. Speeding up the ethics process
 - 4. Innovation process re-design to engage citizens
 - 5. Engaged stakeholders' behavior is expected to change
 - 6. The gap between RRI and OS shall be bridged (and the quadruple helix model will be enhanced).
- RRI being considered as a governance dimension that can be combined with more traditional ones (e.g. efficacy, efficiency and cost-effectiveness) and bears social responsibility. (impact outside the ecosystem). Then, this socially responsible approach to governance can be combined to the economic/managerial approach and lead to a new and valuable governance model.

Finally, if combining the impact of the experiments with the impact of the training tools to be developped during the third practice (P3) of FIT4RRI, it is expected that this combination will lead to the **development of evidence-based guidelines for supporting the creation of governance settings among RFPOs** –settings that will function as enablers for RRI and OS.

P3: Development of training tools and strategies on RRI and OS

A1: The development of these tools and strategies takes place during WP4 (**it has not yet been completed**), and the institutions primarily responsible for this practice is Open University, UK and University of Minho, Portugal. The tools and strategies are related to **RRI and Open Science**, and **enhance competencies and skills** related to the two aforementioned aspects.

A2: The objective of these tools and strategies is to improve the overall quality of the already existing training offer on RRI and Open Science and contribute to new governance structures for RFPOs.

A3: Since the development of these tools and strategies is currently taking place, there is not much information available on the methodological procedures applied. However, it has been reported that for the development of these tools, it was useful to conduct an evaluation of the landscape of the already existing training materials. The actions taking place for this evaluation should be oriented towards five directions:

- 1) what is happening in the development of RRI/OS competences and skills
- 2) the factors limiting the increase in RRI/OS competencies and skills
- 3) the factors promoting the increase in RRI/OS competencies and skills
- 4) the interests and values involved with the development of RRI/OS competences and skills
- 5) successful experiences in development of RRI/OS competences and skills



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Furthermore, FIT4RRI has already created a collection of training tools related to RRI and OS on the FOSTER portal. This collection is the so-called *RRI/OS taxonomy*, which includes a meta-analysis of training resources found in the RRI tooklit (<u>rri-tools.eu</u>) and in FOSTER's e-learning platform (<u>fosteropensience.eu</u>).

A4: As already mentioned in the previous section, for the development (and consequent dissemination) of the FIT4RRI training tools there is a collaboration with the EU project FOSTER and its corresponding platform and a synergy with the RRI tools network.

A5: Regarding the **barriers** to the development of the training tools, certain difficulties in relation the **creation of the RRI/OS taxonomy** have been reported:

- From the very beginning, the initiative to combine both RRI and OS in a single taxonomy of training resources is a challenge itself, since compiling all these training resources can only be considered as an ongoing process and as a work constantly in progress.
- In addition, **individuals from two distinct projects** (RRI tools project and FOSTER project) had to cooperate and, despite the distinct ground of their projects, **build a common ground and "mindset"** for the development of the taxonomy.

A6: These training tools and practices will contribute to the **development of evidence-based** guidelines for supporting the diffusion amongst RFPOs of governance settings functioning as enablers for RRI and OS. Therefore, the training offer itself and the consequent guidelines contribute to changes in RFPOs governance settings (impact inside the ecosystem).

In general terms, the development of the training tools and strategies will enrich and **ameliorate the quality of existing training materials on RRI and OS**, and **new knowledge** will be delivered (impact outside the ecosystem).



4.4 STAGES - Structural Transformation to achieve gender equality in science

Project summary: In order to tackle the gender issue in science challenge (as part of RRI), the STAGES project researches new structural models for embedding gender equality into existing infrastructures. Under the coordination of a national Government, and assisted by a research centre specialised in gender and science, 5 research institutes/universities from Italy, Germany, Denmark, Romania and the Netherlands will each implement a self tailored action plan including activities such as, among others: awareness-raising initiatives in high level institutional bodies; training modules on gender equality for internal decision makers; mentoring programmes for young women scientists; actions to enhance the visibility of women scientists etc. International meetings on Gender and Science will be held and a special attention will be paid to dissemination activities, both at national and European level.

Number of practices: 3

P1: Action plans for introducing gender-aware management in RFPOs.

A1: Within the context of STAGES project (led by the Department for Equal Opportunities, Italy) the first innovation practice referred to the development of **action plans for introducing gender-aware management** at all levels in five participating organisations;

- 1. the Alexandru Ioan Cuza University of Iaşi (Romania)
- 2. the University of Milan (Italy)
- 3. the Fraunhofer-Gesellschaft (Germany)
- 4. the Aarhus University (Denmark)
- 5. the Radboud Universiteit (the Netherlands)

The implementation process of these actions plans, that were related to the **RRI key of gender equality**, lasted four years and was conducted according to a common roadmap. A sustainability plan was also defined for each Action Plan, so as to ensure the continuation of the Actions after the STAGES project lifespan.

A2: These action plans, while **supporting the structural change strategy which was launched by the Commission in 2011** (addressing the problem of gender inequality in science), aimed at developing **integrated approaches to gender inequality allowing to systematically address its basic tenets**. More specifically, these apppaches/action plans had as an objective to promote **gender equality in science through structural transformations** within organisations and by addressing **three strategic areas** in each participating organisation;

- 1. promotion of a friendly environment for women
- 2. development of gender-aware science
- 3. promotion of women's leadership in science

A3: Although different from each other, the Action Plans were **based on a common structure and methodological framework**, defining the three strategic areas that were mentioned above: the promotion of a friendly environment for women; the development of gender-



aware science; the promotion of women's leadership in science. This common framework was used **as a tool for both building a comparable and communicable perspective** to share, and **for the effective tailoring** of the design to the concrete reality and needs of each partner.

All the Action Plans were implemented along with **technical assistance activity to the Teams that were engaged with the Action Plans**. This activity was oriented at steering and continuously **adjusting the Action Plans to changing conditions** as well as at coordinating and **promoting mutual learning processes** among all the partners. The Technical assistance included **different kinds of activities** (in presence and at distance), e.g.:

- the set up and management of an intranet to share materials and products among the partners of the consortium, as well as to manage internal discussion and exchange
- the organisation of **bilateral monitoring sessions**
- the organisation of **working sessions on common issues and emerging problems**, with the production and dissemination of handouts and guidance documents on specific issues
- the organisation of regular on-site visits

Moreover, a **feasibility study on the sustainability of the STAGES Action Plans** was proposed, aimed at favouring the preparation of the sustainability plans of the actions included in each Action Plan.

Out of the 5 gender equality Action Plans, the one developed and implemented by the Alexandru Ioan Cuza University of Iaşi (UAIC) has been reported in thorough details, and the concerete actions initiated withion the project have been numbered. The remaining four Action Plans have been reported in less detail. Therefore, in this section, there is at first a detailed documentation of UAIC Action Plan, and then the other Action Plans are analysed more briefly.

> Alexandru Ioan Cuza University of Iaşi (UAIC, Romania) Action Plan

The UAIC's self-tailored Action Plan (AP) targeted **9 out of 15 faculties**, namely Biology, Chemistry, Physics, Geography & Geology (Life and Earth Sciences), Mathematics, and Computer science (Formal Sciences), Economics and Social Political sciences (Social Sciences) and Letters (Humanities), but **its outcomes extended to the whole university.** It integrated different categories of stakeholders/beneficiaries: **academics, researchers, managers as well as PhD, MA and BA students**.

The Action Plan included **over 90 activities** (given that many of the **40 basic actions had 2-4 or more annual editions**), which have been carried out by 130 organisers and contributors, and have been attended by over 2,500 beneficiaries: professors, researchers, managers, post-doctoral, PhD and MA students. The Table below depicts the objectives of the Action plan and the corresponding actions.



Strategic areas / Objectives	Actions
1. Actions promoting change in organisational culture and formal/informal bahaviors	 Setting up the UAIC's network of Women Academics and Researchers. Documenting and evaluating both qualitatively and quantitatively equal opportunities. Developing gender-disaggregated statistics and gender-sensitive indicators. Organizing a Workshop for research results presentation. Drafting and establishing guidelines and policies. Establishing a Senate position for the representatives of the UAIC Network of Women Academics and Researchers. Setting up periodic reporting practice on equal opportunities in the Senate/Rectors board. Setting up periodic training modules for University's employees. Setting up periodic training modules for University's managers. Institutionalization of the "UAIC's Network of Women Academics and Researchers". Documenting the integration of a special chapter (or special provisions) on Equal Opportunities of women and men in the UAIC chapter. Study on developing national standards for gender equal opportunities in funded research (based on a comparative analysis between RO and EU countries, carried out in cooperation with ARACIS and UEFISCDI/CNCSIS). Website building and permanently updating for the communication and dissemination of the UAIC- STAGES project activities. Setting up the UAIC centre for Gender Equality in Science. Setting up the UAIC centre for Gender Equality in science. Freparing the UAIC centre for Gender Equality in Science for continuing and developing the GES activities initiated by the UAIC-STAGES project (sustainability plan and responsibilities distribution).
	Equality in Science staff (international exchange of

 Actions promoting work-life balance Actions supporting early stage career development 	 practices) for continuing and developing the GES activities. 1.18 Final assesment of the UAIC-STAGES' team contributions in producing structural changes to achieve gender equality in science at the UAIC. 2.1 Proposals for improving and developing existing childcare services for academics and researchers. 2.2 Dissemination information on childcare and other services delivered to staff. 3.1 Negotiating with the National Agency (CNCS) to extend provision of grants to be allocated for women's professional development. 3.2 Providing information and advice on career and professional development. 3.3 Early-career researchers' day.
4. Actions challenging gender stereotypes and consequent horizontal segregation	 4.1 Creating the Compendium of women researchers at UAIC. 4.2 Setting up the special exhibition on Women and Science at UAIC's museum. 4.3 Organising the Annual Thematic Workshop of UAIC's network of Women Academics and Researchers.
5. Actions aimed at gendering S&T contents and methods.	5.1 Implementing a cross-disciplinary teaching module on gender and science.5.2 Introduction of the theme <i>Gender Equality in science</i> in PhD studies.
6. Actions promoting women's leadership in the practice of research	 6.1 Carrying out a national evaluation study on women's participation in the funded research. 6.2 Publication and wide dissemination of the outcomes of the study. 6.3 Negotiating the integration of the national guidelines for project applications with provisions encouraging women's participation.
7. Actions promoting women's leadership in the management of research	7.1 Negotiating proposals of new transparent rules and procedures for appointing/electing members of the high-level boards and commisions.
8. Actions promoting women's leadership in scientific communication	 8.1 Acknowledging the successful careers of female researchers in S&T , through permanent sections on women's achievements on the project's website and periodic media campaigns. 8.2 Documentary films/videos on "Life and career of outstanding women scientists in Europe".



	 8.3 International Conference//Colloquium "Women and Scientific Research: Outcomes and Future Challenges". 8.4 Establishing the "Science and Technology Excellence Awards" for outstanding women in S&T.
9. Actions promoting women's leadership in innovation processes and science-society relationships	 9.1 Organising the annual public event "Women Researchers Day". 9.2 Writing and publishing a scientific book on <i>Gender Equality in Science</i>. 9.3 Developing cooperation and partnership in order to extend and multiply UAIC's experience and good practices set up during the STAGES project to the other universities in Romania (in collaboration with ARACSIS, UEFISCDI, MEN and universities).

Table 6. UAIC's Action Plan (objectives and specific actions)

University of Milan (UMIL, Italy) Action Plan

As previously mentioned, UMIL's Action Plan towards gender equality has been reported more briefly. First of all, the Action Plan targeted **mainly two faculties** – the Faculty of Agricultural and Food Science and the Faculty of Medicine. **The Faculty of Agricultural and Food Sciences** showed interesting **patterns in terms of horizontal segregation** with some departments where women numbered half the full and associate professors, and others having no female full professor. **The Faculty of Medicine** is the biggest and, historically, the first UMIL faculty. It has a very complex and articulated internal organisation with large numbers of women. **Vertical segregation, however, represented a persistent and crucial problem**. At the time when the Action Plan was drafted, 67% of the post-doctoral students and almost half of the researchers were women vs. less of 15% of women who were full professors.

The Action Plan was drafted following the process of analysis and stocktaking. It had the twofold aim of promoting gender equality in career paths, and "gendering" the contents and the methods of scientific research at the same time. Actions focused on both careers and "genderisation" of research were thus implemented in the two targeted faculties with some actions addressing the entire university.

Fraunhofer-Gesellschaft University (FRAU, Germany)

Fraunhofer is Europe's largest application-oriented research organisation. In 2012, the proportion of female researchers without leadership responsibility was under 21%. The STAGES project team was part of the Fraunhofer-Institut für Arbeitswirtschaft und Organisation (IAO), based in Stuttgart.

Early in 2003, the Fraunhofer Gesellschaft stated its support for the application of the principles of "gender mainstreaming" and equal opportunities standards and committed itself to increasing the involvement of women in the domain of science and their access to executive positions. But there was no systematic overview and assessment of the activities in the various Fraunhofer institutes and no systematic exchange about good or successful initiatives.



This is why an internal market for gender diversity in science and innovation was built within the STAGES project. Given the decentralised structure, it was important to establish good relations to the Equal Opportunities officers-BfCs in the institutes and the Equal Opportunities commissioner (GB) who coordinates all the BfCs. To be able to initiate activities on a higher level, cooperation with the central Human Resources Development Department was finally necessary.

Aarhus University (AU, Denmark)

Previous to the implementation of the STAGES project, women in AU comprised merely 14.2% of the full professors and 31.5% of the associate professors. Since the late 2000s, Aarhus University has undergone a far-reaching transformation process restructuring its entire organisation, which has been considered by the STAGES team as an excellent opportunity to put the issue of gender equality on the agenda and make it one of the key elements of structural change.

In this framework, the Action Plan involved a set of integrated activities, targeting the entire university and all faculties. The Action Plan geared at achieving sustainable results with specifically tailored gender equality actions in key strategic areas:

- to create more women-friendly environments
- promote **gender-aware science**
- Promote **women's leadership of science** with specifically tailored gender equality actions

The overall strategy that was followed was threefold, i.e. a top-down approach, a bottom-up approach, while cross-cutting activities were initiated concurrently;

- The primary aim of the top-down, evidence-based approach has been to raise awareness of GE challenges among external stakeholders at the national level. This strategy involved an intensive presence of the STAGES team in national and local media, the organisation of workshops and seminars, and extensive participation in different GE arrangements. It also included an effective awareness-raising campaign placing GE high on the public and policy agenda. The second segment of the top-down approach involved the intensified efforts of the team internally, and required an active involvement of leadership at all levels, supporting and advising the HR Department, the Diversity Committee and the Committee for Research and External Cooperation.
- The objective of the bottom-up approach has been to reach out, mobilise and support female researchers, in particular through the organisation of empowerment initiatives for younger female researchers. Efforts targeted both external and internal stakeholders.
- The **cross-cutting strategy** that was endorsed was based on a dynamic and integrated process **bringing together the top-down and bottom-up approaches**. Central in the process has been the adaptation of a **"small steps" pursuit**:
 - <u>successively achieving legitimacy and visibility (locally and nationally)</u>
 - linking GE to "accepted" issues and expanding the "justice" argument
 - framing GE issues in terms of innovation, internationalisation and competitiveness
 - challenging the concept of excellence and the idea of the "gender blind" university



Radboud University (RU, The Netherlands)

The tailor-made Action Plan for the STAGES project at RU was directed at two research institutes, namely the Donders Institute for Brain, Cognition and Behaviour (DI) and the Institute for Management Research (IMR). There was an analysis of gender inequality in their research institutes in order for them to become problem owners (DI and IMR leadership). The method of Group Model Building that was applied during the gender awareness training, invites the stakeholders to discuss and understand the dynamic structure underneath gender inequality in their institutes and to identify leverages for change.

At the DI, three project team members became part of the gender steering group that was responsible for implementing the measures aimed at gender equality. At IMR, after the training, the project team members were informally consulted on a regular basis by the faculty board, for example on the new strategic plan and for screening job advertisements on gender bias.

The design of the Action Plan was adapted to the specific context of the organisations. In the design of the list of actions at RU, a combination was made of interventions that fall within three strategies areas:

- creating women-friendly environments
- mentoring programme
- women's network
- work life policies
- gender aware science
- gendering the content of master and PhD courses
- gender awareness training of the leadership
- women's leadership in science
- <u>scrutinising gender target figures</u>
- improving visibility of women scientists
- gender research

The project team also built sustainable relationships with stakeholders, like the leadership of the research institutes, the university and the diversity officer, by **critically scrutinising existing policies**, such as the mentoring programme, work-life policies, internal communication on recruitment and gender target figures.

A4: It has been reported that all Action Plans foresaw **partnership and cooperation** with external actors. More specifically:

- In UAIC's Action Plan, a partnership with the national agencies responsible for higher education evaluation and research funding (ARACIS, UEFISCDI) and the Ministry of Education and Research was established.
- In **UMIL's Action Plan** and within the context of gender medicine, the University proceeded to a collaboration with **the Health Department of Lombardia Region**.
- In AU's Action Plan, there were interactions with stakeholders including the political system, key national agencies, other policy makers and experts as well as the public in general, so as to raise awareness of gender equality challenges at the national level, in a Danish context where the universalistic idea of gender-neutral meritocracy is robust. There was also a synergy with the National Task Force on "More Women in Research" for the development of a policy paper for gender equality within the University.



A5: No information available.

A6: In general terms, all the Action Plans had as an immediate impact various **structural changes within the internal mechanisms of the RFPOs** (impact within the ecosystem), as well as an unexpected broader **impact outside the environment of the participating organization** per se (impact outside the ecosystem). These aspects are mentioned in more detail in the table below, for each RFPO separately.



- 	· · · · · · · · · · · · · · · · · · ·
RFPO	Impact of the Gender Equality Plans - GEPs
Alexandru Ioan Cuza University of Iași (UAIC, Romania)	 Impact inside the RFPO's ecosystem Creation of the UAIC's Centre for Gender Equality in Science, which is the first centre for coordinating research, monitoring and documentation on gender equal opportunities in academia and research set up in a Romanian university. The Centre was charged to elaborate GE programmes according to the European policies and national laws, as well as to give periodic reports on dynamics of GES. Creation of the UAIC Network of Women in Academia and Research, the first institutionalised association including women and men academics and researchers, interested in promoting organisational development in order to implement practices and programmes for improving GE at UAIC. Development of the UAIC Research Group on Gender Studies, a multidisciplinary research team, composed of researchers with gender expertise from previous national and international projects, as well as young researchers. Its task is to conduct studies and evaluation on GES in Romanian institutions, particularly at UAIC. Development of UAIC-STAGES Communication Team, including specialists in communication sciences geared towards elaborating and implementing a multimedia communication strategy, so as to increase the public visibility of the scientific performances of women researchers and to disseminate gender equality actions promoted at UAIC. Practices of monitoring GE dynamics, evaluation of activities and periodic reporting; creating a systematic Gender Equal Opportunities Database in accordance with the EC indicators, drafting guidelines for policies or documenting the provisions on GE in the UAIC's Charter. Practices of gender problematisation by introducing gender issues and challenges on the institutional agenda (e.g. special sections on Gendered Innovation and Research within International and national scientific events hosted at UAIC. Impact outside the RFPO's ecosystem All the above structures an
University of	Impact inside the RFPO's ecosystem
Milan (UMIL,	• Creation of the course "Equal Opportunities and Scientific Careers" which was replicated for the 4 years of the project
italy)	(genderisation of curricula within the university).
	• A Network of Female Researchers was created at the Faculty of
	Agricultural and Food Sciences.





	• Awareness-raising among the top management as well as among
	professors, researchers and students regarding the very existence
	of a problem and of its negative impact on the organisation and on
	society.
	• An increased number of stydents attending the course "Gender
	medicine" in the Faculty of Medicine.
	• A growing number of professors and researchers involved as
	teachers in the above courses have included a gender medicine
	perspective in their own courses.
	• Creation of the new Centre for Coordinated Research GENDERS -
	Gender & Equality in Research and Science.
	• A new provision within the university; "among the 8 appointed
	members of the Board of Directors each gender must be
	represented by at least 3 members"
	• For the first time in UMIL history two out of the four Delegated
	Prorectors were female (the Prorector for Research and the
	Prorector for Internationalisation).
	Impact outside the RFPO's ecosystem
	 The course of "Gender Medicine" was added as a pilot course at the Deliving Medicine" was added as a pilot course at
	Ine Policinico Hospital Unit nosting a Single Cycle Degree in Medicine at the San Baole and the Sacce Hospitals (genderication
	of curricula outside the university)
	• The four-year study within the context of the Action Plan related
	to career naths in the medical profession from a gender
	<i>perspective</i> , allowed the team to gather data in a relatively
	unexplored field of resear ch and to shed light into the less visible
	mechanisms leading to unequal career outcomes between men and
	women doctors in academia and health organisations.
	• The results of the above study led to the creation of additional
	Crash Courses to the top management of single Hospital Units
	(genderisation of curricula outside the university).
Fraunhofer-	Impact inside the RFPO's ecosystem
Gesellschaft	the National Committee (five National Committees were
University	established in the first year of the project implementation period)
(FRALL	played an important role both in supporting the Action Plan and
(ITAO, Germany)	in facilitating the contacts between the Team and external
Germany	institutions, with special reference to other non-university
	research institutes and private research centres. The activities
	carried out have had a remarkable impact, offering the
	opportunity to Fraumorer to take a leading position.
	Impact outside the RFPO's ecosystem
	• the development of the "BfC Report" (BfC is an acronym for
	"Beauftragte für Chancengleichheit" referring to the Equal
	opportunities officers in each institute). It contains data (collected
	via an online questionnaire which was filled in by the $BfCs$) about

	the share of women in different wage groups and leadership levels and about the use of different measures for equal opportunities.
	With this Report, the institutes can compare their situation with
	other institutes and monitor developments in their own institute
	over the years. The topics in the Report are the following:
	- Details of the Fraunhofer institute
	 Participation of women at the institute
	 Information on the position and work environment at the
	Institute relating to the BfC
	- Highlights at the institute in the field of equal opportunities
	- Support programs, career development programs, support of
	young talents
	- Measures for work-life balance at the institute
	- Other measures for supporting females employees
	- The BfC's opinion considering the equal opportunities at their
	Institute
	- Further support for the BfC
	- Praise and childsin of the process of the report
	• Development of the footbox, which is a collection of good
	Fraunhofer STAGES website in a member's area, the Toolbox This
	area is visible for registered persons. Apart from Fraunhofer staff
	anyone from other research organisations or companies who are
	interested can also register. So far, the toolbox contains 46
	examples categorised in six categories:
	- Gender-aware organisational culture
	- Work-lifebalance
	- Career support for women
	 Recruiting young talent
	- Gender-aware research
	- Visibility of women in science
	Impact inside the REPO's ecosystem
Aarhus	Establishment of a GE resource centre raising awareness
University	supporting and advising informal female networks and mentoring
(AU,	programmes training young researchers etc
Denmark)	 Development of a policy paper explicitly specifying the prevailing
	challenges to the advancement of women academics, and how to
	address them, making the management externally accountable
	for the persisting gender inequalities. The announcement of the
	STAGES policy paper led to the following:
	- AU's university newspaper "Omnibus" published a monthly
	edition under the general theme of "Gender Equality"
	- Aarhus University's scientific area of Health has drawn heavily
	on the findings of the STAGES policy paper in the development
	of a new decentralised gender equality action plan.
	• The team has also presented the outcome of STAGES to the
	Academic Council at the Faculty of ARTS and advised them in
	connection with their new Gender Equality Plan 2016-2020.

	 During the period of 2012-2014 two new gender oriented networks have emerged at AU; The Women in Physics network consists of women researchers at the Stellar Astrophysics Centre and addresses structural and cultural barriers for gender equality in the natural sciences. The Gendering in Research network (GiR) is an open network established as a platform where researchers and students with interest in gender research meet once a month for a gender focused presentation and talk. Impact outside the RFPO's ecosystem Impact on national policy documents; the recommendation report of the National Task Force on "More Women in Research", published in May 2015, credits the STAGES policy paper as one of its main sources of inspiration. Offering input for publications; based on the work carried out within the frame of the STAGES project at AU, Mathias W. Nielsen published an article in <i>Nature on the limits of meritocracy and of making academic job advertisement fair to all</i>, as too many university posts are given to men without proper competition. Revitalisation of GE in science as a pertinent topic in the Danish public debate, by continuously writing newspapers, journal and science-webzine articles, and participating in interviews in national media (the STAGES team has been acknowledged as being the main experts in structural changes initiatives both at local and at national level).
Radboud University (RU, The Netherlands)	 Impact inside the RFPO's ecosystem Institutionalisation of the Halkes Women Faculty Network, for female academic staff from PhD students to Associate Professors, and recognition of it as a conversation partner in setting university equality policies. Along with the Halkes Women Faculty Network, the existing university's Network of Female Full professors (NVH) was complemented. The establishment of the Gender Equality Committee at the Donders Institute. Increase in the number of female mentees (academic and support staff): from 25 mentees in 2011, to 35 in 2015. Increase in the number of female full professors in IMR and DI: from 22% in 2011 to 28% in 2014 in IMR, and from 10% in 2011 to 17% in 2014 at DI. Work-Life balance for females became an issue in the strategic plan of the university for the period after the project (2015-2020). A bi-annual PhD course on Research Methods from a Gender Perspective has been developed and implemented, and is now part of the regular course programme of the Institute for Gender Studies.

	•	A gender dimension has been integrated in the European Master of System Dynamics (genderisation of curricula). The development of the mentoring programme for women and men at Donders Institute.
T	able 7. I	mpact of the Gender Action Plans (STAGES project)

P2: Ongoing and final evaluation of the Action Plans

A1: All the Action Plans and corresponding activities were constantly **analysed**, **monitored and evaluated in each institution**. The evaluation of the action plans and of the gender equality activities has been **ensured by ASDO** (the organisation in charge of evaluation). More specifically:

- The evaluation was held every year during operation (ongoing evaluation).
- It was held once again **upon the completion of the project (final evaluation)**.
- Overall, four annual evaluation reports and a final evaluation report were drafted.

A2: This activity aimed at **monitoring the quality of the implementation** of the Action Plans. Especially the evaluation approach did not intend monitoring as a static judgmental procedure, where data were periodically collected to simply express an assessment or to "give a score" to the APs, to be passively recognised by the implementing teams. **Evaluation** was rather aiming to provide an opportunity, offered and structured by the Evaluation Team, to **develop a shared process of reflection on the problems** met during the implementation of the Action Plans, so as to **activate learning processes on the basis of experience and produce knew knowledge, as well as to promote a deeper understanding of the dynamics surrounding structural change.**

The **annual assessments** made during operations intended both to **verify the progress** made in the planned activities and to **record and evaluate the changes occurred while the Action Plans are implemented**.

A3: Evaluation provided information that could be used for practical purposes and for producing new knowledge. Through **periodic checks**, it included **support for the advancement and the overall quality of the tasks assigned to the STAGES partners** in charge of the five Action Plans, and ensured that they were able, if necessary, to adjust project activities to the changing needs and/or goals of the concerned institutions. Five evaluation criteria had been applied:

- 1. **Effectiveness**, intended as the capacity to implement the activities according to the Action Plan's provisions and objectives.
- 2. **Efficiency**, intended as the capacity to make the best use of available resources, complying with the timeframes and procedures contemplated for expenses, in the context of a good managerial capacity.
- **3.** Impact, concerning the satisfaction of the beneficiaries of the Action Plans and the capacity to promote consensus among the other players involved (subjective impact) and the effects obtained in terms of real change within the organisations (objective impact).
- 4. **Sustainability**, which refers to the capacity of the actions implemented through the Action Plans to continue producing effects even beyond the end of the programme.

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5. **Relevance**, concerning the adequacy of the initiatives foreseen in the Action Plans to the situation of the organisations in which they are conducted, as well as to the wider social, cultural and economic contexts of reference for S&T in the different countries involved. According to the strategic approach of STAGES, relevance encompasses also the analysis of negotiation activities carried out for each Action Plan as for institutional, interpretive, symbolic and operational levels.

More than **70 indicators, mainly but not only qualitative**, were identified, covering all the criteria bove. **The evaluation of the Action plans was based on several sources**:

• Living sources:

- project team
- beneficiaries
- other staff of the institutions not directly involved in the Action Plans
- members of IBSA
- national committees of the project

• Documentary sources:

- notes of the monitoring sessions
- reports of meetings
- official documents as deliverables and websites
- other working documents of the implementing institutions

• Technical tools:

- ongoing evaluation grids
- questionnaires addressed to different interlocutors
- reading grids and check-lists to read and analyse deliverables and other documents

As mentioned in A1, **ASDO was in charge** of the data collected, but there was also a **contribution from the Action Plans staff**. Finally, an important role was attributed to the **teams conducting self-evaluation**, which was integrated with the evaluating team's point of view.

A4: No information available.

A5: No information available.

A6: The practice of the evaluation of the Action Plans had **an impact mainly inside the ecosystem** of the participating RFPOs:

- They contributed to the assurance of the succesflul implementation of the Action Plans, as well as to the promotion of mutual learning practices among all partner institutions.
- Concurrently, this evaluation contributed to the realisation of the following innovation practice within STAGES project, in other words the development of a set of guidelines about the actual implementation process of gender equality-oriented projects in scientific institutions.



P3: Development of Guidelines for Gender Equality Transformations in RPOs

A1: A set of Guidelines was developed within the STAGES project. These guidelines were exclusively based on tools and approaches tested by the project partners on how to promote structural transformations in research organisations, and more specifically transformations related to the RRI key of Gender Equality.

A2: The main objective of these guidelines was a **broad knowledge transfer**, since they were produced with the aim of **spreading**, among European universities and research institutes **successful practices and negotiation strategies favouring structural transformations** and new insights about the **actual implementation process of gender equality-oriented projects** in scientific institutions.

A3: Since the Guidelines aimed to derive new insights about the actual implementation process of gender equality-oriented projects in scientific institutions, they did not have the ambition of presenting a new original set of principles and recommendations on the necessary components of a gender equality programme, but focused on the know-how which was gained in the implementation of the STAGES Action Plans. Therefore, the focus was on implementation strategies, through the presentation of the different solutions envisaged by the partners to achieve their objectives (practice-based Guidelines).

The Guidelines were developed under the coordination of ASDO with the cooperation of all the partners, and were separated in two parts. The First Part of the Guidelines contained basic information about the five Action Plans and the institutions where they were implemented, particularly relevant in the framework of practice-based, contextual Guidelines.

In the Second Part, the recommendations (20) are presented in six broad fields of action. These have been identified and discussed by the partners, with the contribution of the project's International Board of Advisors, as essential elements of a structural change process. Most recommendations are broken down into specific lines of action (41), and all are exemplified by a selection of the relevant practices tested by the partners (100 overall). The six fields of action are:

- 1. Collecting data and monitoring gender equality
- 2. Engaging leaderships
- 3. Policy-making and institutionalisation
- 4. Networking and empowering women to take action
- 5. Integrating gender in education and research
- 6. Communication and visibility

In the **introductory part**, a set of **cross-cutting issues** are also presented, including:

- the strong contextual character of the implementation process
- the need to constantly negotiate the meaning of gender equality
- the overlap among actions directly addressing women researchers, those addressing their institutions and those questioning the neutrality of scientific disciplines
- the necessity of building the Action Plans on the basis of a careful identification of the resources available within and outside the organisation



- the need for bridging top-down and bottom-up approaches as well as for developing cooperation relationships with external
- the presence of recurring patterns in the time necessary for the Action Plans to develop
- the need to constantly adapt and redesign the Action Plans to keep them relevant to emerging contextual situations, needs and priorities
- the importance to start from the very beginning the quest for ensuring future sustainability of the actions initiated under the Action Plan

A4: No information available.

A5: No information available.

A6: The STAGES Guidelines are the main exploitable product of the STAGES project as a whole, and they had a **considerable**, **broader impact outside the ecosystem** of the RFPOs participating in the project:

- They had the advantage of **looking in depth at implementation issues based on experience in five different organisational settings**, but concurrently developing recommendations that readers could interrelate with the situation at their institution and with its particular implementation challenges and dynamics.
- They can be therefore inspirational for policies both at national and at European level.
- It should also be highlighted that the Guidelines have been used for the preparation of the EIGE's (European Institute for Gender Equality) Online Toolkit on Gender Equality Plans, aimed at capitalising on the experience of the structural change projects for further disseminating best practices and support tools for implementation.



4.5 ENGAGE - Equipping the Next Generation for Active Engagement in Science

Project summary: ENGAGE synthesises contemporary models of professional learning and curriculum development. Going beyond training events, there is a three-stage path that propels teachers in their own inquiry to become expert with RRI. Then, students also get engaged in open-ended projects with teachers and into partnership with practising scientists, to learn about RRI directly.

Number of practices: 3

P1: Topicals (ADOPT) - inquiry-based teaching through science-in-the-news contexts and open curriculum materials

A1: Within the context of ENGAGE project (coordinated by Centre for Science education - Sheffield Hallam University), **22 'entry-level' activities were developed, and students applied science knowledge and enquiry /RRI skills to a socio-scientific dilemma**. Then a stimulating activity was given to students to review the science and develop an informed opinion. As lessons (related to the RRI key of science education), these would last for one **40-60 minute session**. The ADOPT materials and activities were implemented between July 2014 – June 2015 (WP4) in **11 countries**: UK, Greece, Germany, France, Spain, Romania, Israel, Norway, Switzerland, Lithuania and Cyprus.

A2: The objective of the Topicals (ADOPT) practice was to:

- Combine exciting learning materials based on *dilemma lesson tool* and the group *discussion tool*, so as to function as pedagogical tools for *teachers* to get students engaged in socio-scientific issues related to RRI.
- The ADOPT materials would primarily introduce the target individuals into these issues through simple activities.

A3: Different tools and activities were developed for applying the Topicals (ADOPT) practice (further described in Table 11):

The main tools were:

- 1. Dilemma lesson tool
- 2. Group discussion tool

The main activities were:

- 1. Materials Topicals
- 2. Online Courses Workshops
- 3. Online Community

Activities	Short description
1. Materials - Topicals	 They were developed by Sheffield Hallam University They focused on getting students to practice skills and knowledge already taught A short duration: approximately 20 minutes
	 Each Topical consists of a power point presentation and a teacher's guide, while curriculum links and weblinks relevant to the activity are also provided.
	• All the materials had certain things in common : Emerging science and technology contexts, RRI goals, Structure and design of material
	 Two tools were employed and each lesson was developed by combining them: the dilemma lesson tool and the group discussion tool
	 tool 1. Dilemma lesson tool: 6 'Productive Dilemma' criteria (quality criteria) were co-developed by partners. The team invented the notion of a 'Productive Dilemma' since the tasks that focus around students intrigue questions which have no obvious right answers. This notion is also accompanied by a set of criteria with checklists to help teachers a) evaluate possible socio-scientific issues and b) craft an issue so that it meets the productive dilemma criteria. The criteria were the following: It's authentic It's controversial It's engaging
	- It's covered - It's social
	- It's RRI
	 Group Discussion tool: This tool provides teachers with practical techniques to ensure students can work together productively in groups. It involved four types of discussions:
	- brainstorming discussions
	- synthesizing discussions,
	- sense making discussion.
	• The materials were disseminated to teachers through the ENGAGE website. The project website or Knowledge Hub consisted of a platform in nine languages for 11 countries. Each country translated the project website into their own language (a multi-lingual platform)
	 There was a 'localisation' stage in production where specific details and cultural references could be changed, s o as to localize the materials in order to make ENGAGE materials relevant to each country. Aspects that were changed were: specific contextual information, scientific data, additional content, weblinks for news stories and media

		 Some examples (all them available <u>here</u>)of the ADOPT materials – topicals are: Text neck Science: Forces Society: Ask and define (define a problem and devise a plan to investigate it) Eat Insects Science: Physics (Waves) Society: Evaluate claims Invasions Science: Ecosystems (Interdependence Society: Consequences
2. Works	hops	 They are a blend of online learning modules and face -to -face events (Workshops). The main goal of ADOPT Workshops was to maximize the probability that teachers will use the 2 tools (dilemma lesson tool and the group discussions tool) when delivering lessons The workshops' strategy had two parts: understanding and enabling teachers <i>Understanding:</i> Introducing the purpose of the Tool and breaking it down into 'chunks' and model each one clearly. Enabling: Teachers immediately practice using each chunk and receive feedback.
3. Online comm online	unity – courses	 The main goals of the 2 online pilot courses was to: present the dilemma lesson and the group discussion provide simulated practice for teachers, in a supported atmosphere of experimentation learning directly from 'experts' to create a forum discussion for planning a lesson and promote the successful use of curriculum materials with feedback to emphasize the possible difficulties that participants can face during the course activities

Table 8. Activities and tools employed in the Topicals - ADOPT practice

A4: Besides the project partners that contributed to the materials' development, **teachers could contribute to the ideas selection, and to the treatment of the ideas in outline development.** A widget was created on the website homepage, inviting teachers to vote or suggest ideas, through a link with the Pinterest online software.

A5: Certain obstacles/challenges were:

- To get teachers who are under great pressure to deliver the curriculum in school to participate.
- Setting up the online community: Few partners reported evidence of significant discussion between teachers online. Other countries tried to supplement the online



community with face-to face events, which have created a cadre of innovative teachers as part of the project legacy.

A6: With reference to the impact of this practice, it was detected that:

- The target for the ADOPT stage was reached, by publishing 22 Topicals in all 11 countries.
- The ADOPT Topicals had a major impact on the users' community (science teachers), since the total number of users registered in the ENGAGE knowledge Hub reached 16,107, with 10,218 of these having downloaded at least one ADOPT material (a success rate of 87% on initial targets set).
- Evidence on usage of the ADOPT materials in the Knowledge Hub has been provided by more than 1,750 comments published by users.
- At least **two workshops** were conducted in each of the 11 countries of the consortium on the dilemma and group discussion teaching strategies, engaging a total of 1,268 teachers.
- A platform for delivery online CPD in Massive Online Open Communities (MOOCs) was developed. 25 online courses were delivered in the lifetime of the project in the 11 countries of the consortium, in which a total of 974 teachers enrolled.

P2: Sequences (ADAPT) - Open Online and just-in-time learning

A1: The ADOPT teaching approaches led to using more advanced ADAPT materials in the next stage. The next practice ADAPT included 12 'advanced level' activities, which explicitly teach students enquiry/RRI skills and Sequences using game. Then, students apply these to solve a socio-scientific Dilemma. It offers an expert's toolkit of examples, explanations, strategies and activities to help students learn effectively skills for RRI. These lasted from 1-2 lessons. The ADAPT materials and activities were developed during WP5 of the project.

A2: The aim for developing the Sequences-ADAPT practice was:

- After introducing teachers to the project principles of RRI in P1, the goal was to then encourage *teachers*' confidence and progress to employ more challenging materials that promote scientific inquiry skills integrated with the principles of RRI.
- Increasing *teachers'* commitment to including RRI in the classroom and consequently engaging students to more challenging material as well.

A3: In order to commit teachers in a more intense way to RRI teaching than in the ADOPT practice, and thus explicitly teaching RRI skills to their students, **different tools and activities were** advocated. A **localization process also took place** as in the ADOPT stage (P1).

- > The main tools were:
 - 1. <u>ADAPT CPD tools</u>: It refers to problem solving, which is as an advanced version of the ADOPT tool called "dilemma". In this problem solving tool, a repertoire of skills is explored through games set in familiar contexts, which are then built upon by applying the skills learnt to real-life scientific dilemmas.



- 2. <u>Conversation</u>: It builds on to the ADOPT tool "group discussion". In this conversations tool, teachers are guided through a range of different techniques to help their students take part in genuine and useful group discussions.
- The main activities were: (they constituted the teacher inquiry model, whose goal is to assist teachers in questioning their practice in the light of RRI)
 - 1. Materials
 - 2. Online courses (MOOCs)
 - 3. Community

Activities	Short description
1. Materials - Sequences	 They were developed by Sheffield Hallam University. They included a series of lessons, enabling to teach new science content and skills. The following criteria informed the design of the materials: Scenarios: engaging students in a realistic scenario. For instance, animal testing for science. Learner ideas: students defending ideas from others and not only their own. Longer and more flexible: enabling deeper practice of inquiry than topicals (from ADOPT) Templates: at an internal level, templates will enable releasing materials shortly after the news story constituting the context of the material comes out. A game should be used as a learning activity to explicitly teach RRI skills Each material will tackle one of the 8 RRI skills as stated in the ENGAGE RRI curriculum All materials were disseminated to teachers through the ENGAGE national portals (i.e. Knowledge Hub) Examples of materials (all of them available at https://www.engagingscience.eu/en/materials/) Animal testing Electronic cigarettes 2 degrees? Man or machine? To frack or not?
2. Online courses (MOOCs)	 They were developed by five partners led by the Open University (OU). The goal of the online courses was to provide teachers with conceptual input on the pedagogical strategies recommended for RRI teaching by: Explaining teachers in a detailed way the pedagogical benefits and groundings of the learning activities present in the ADAPT materials, and checking their understanding

	 Promoting the inclusion of the ADAPT materials in their teaching practice with the support of expert RRI teachers Fostering reflection and exchange of tips and advice related to explicitly teaching RRI skills to their students with the ADAPT pedagogical tools The online courses employed the two ADAPT tools: RRI Problem-solving lesson tool: Processes and skills Thinking guides RRI Conversation tool: Teach an argumentation framework - to scaffold students towards competence Develop student communication skills - how to facilitate a well-ordered discussion Model an open stance - how to handle controversy
3. Community	 The goal was to stimulate teachers who had used the materials from this phase to reflect on why and how they work. Teachers could ask questions or engage in discussions about different aspects of the materials. University of Barcelona (UB) created and shared with partners a set of guidelines for managing an online community of practice. The guidelines aimed to be a tool for mentors to promote exchange with teachers and between teachers themselves (available in <u>Deliverable 5.10</u>).

Table 9. Activities in the Sequences - ADAPT practice of ENGAGE project

A4: Several tools were developed and implemented to collect quantitative and qualitative data about teachers' behaviour on using the resources. However, there was also a use of already existing tools; **data were collected using external tools (Google Analytics, AWStats).**

A5: While the aim was to develop 20 activities, **fewer activities were developed** since it proved **much more complex and time-consuming than anticipated to create a** *Sequence* **that teachers would find sufficiently valuable to give 2 lessons of curriculum time for.**

A6: With reference to the impact of this practice (and mainly in relation to the users' – science teachers' community), it was detected that:

- ADAPT achieved its aim of getting initial ADOPT users to get more involved in RRIteaching (from a total of 11,940, 26% moved forward to ADOPT, so they could use the more advanced materials).
- All partners ran online courses, with 236 teachers completing about 65% of the target.



P3: Projects (TRANSFORM) - Partnerships system for school-scientist projects

A1: Within the context of this practice, a total of 16 extended enquiries into socio-scientific issues were developed. Open-ended projects were offered to put teachers and students into partnership with practising scientists and learn about RRI directly. The Transform practice had a strong focus on RRI issues: role of media, ethics, socio-scientific issues, socially relevant impacts of research, the nature of science in society, etc. Finally, the implementation of the TRANFSORM practice began in December 2016.

A2: The objectives of this practice were:

- To propel a proportion of teachers from the ADAPT stage to reach the 'transformational' stage through experiences such as co-creation of resources, training other teachers or mentoring.
- To encourage deeper, sustained reflection about teacher practice and the nature of science, and its importance for students' futures and society.
- To equip these teachers as the 'go to person' in a science department, who can support colleagues in developing their own RRI practice.
- To enable through its activities students to work more autonomously using RRI skills.

A3: Three **activities** were considered, so as to apply the Projects - TRANSFORM practice.

- 1. Materials: projects with student-scientist collaboration
- 2. Online courses: creation of personalized RRI curriculum materials
- 3. Online community: teachers take leadership role in the community

Activities/strategies	Short description
1. Materials - Projects	 These were projects, that were more open ended, articulated and time intensive than previously developed materials. They allowed teachers to frame whole topics within RRI issues. The idea of the Project is to mimic the conditions under which students will meet science issues beyond school - the most 'authentic' way to learn. They were designed for students who have already experienced Topicals (ADOPT) and Sequences (ADAPT). Transform 'projects' guidelines were developed. These were piloted in 4 countries (UK, Spain, Germany and France) under coordination of WP6. Each country then developed at least 1 Transform projects:

	 <u>Global projects</u>: These could either be used directly by Transform teachers, or serve as examples to scaffold the local, teacher led projects. They were highly dependent on communication campaign, MOOCs, workshops, that occured at different times in different countries Examples: "Exterminate" and "Ecophone". <u>Local projects</u>: A gallery of exemplar local projects was built collecting best examples from each partner. It represented a reference base, that local partners could use to inspire their own activities, or even offer them as examples for the involved transform teachers. They involved direct contacts with real life situations/actors .Examples: France – " in the brain of a teenager", Israel – ""chemistry & our life" (all projects are available at ENGAGE website).
2. Online courses	 The aim of these courses was for one to develop their own RRI curriculum materials They included guidelines for working with key-players There was also a performance assessment tool
3. Online community	 The TRANSFORM community strategy was largely determined by the outcome of the ADAPT community strategy. The focal point was developed on the backbone of the ADAPT phase. The community included RRI champions teachers and examples coming from ENGAGE expert teachers (weather newcomers or following the ENGAGE pathway)

Table 10. Activities / Strategies in the Projects - TRANSFORM practice of ENGAGE project

A4: For developing the TRANSFORM practice, **partnerships with relevant stakeholders were built**. These potentially acted as content providers, dissemination agents, target groups, critical friends or a combination of those. Key stakeholders involved were:

- Scientists
- Research organisations
- Science museums/science centres and informal science education institutions
- The media and journalists
- Educational institutions
- Industries/the business sectors

A5: The initial goal was to develop up to 20 projects. As with Sequences Practice (P2), it was found that the development of high quality, project-based learning that would be useful to teachers across all countries was a complex and time-intensive process. Therefore, the number of projects was narrowed down.

A6: With respect to the impact of this practice:


- The total number of downloads for TRANSFORM Projects was more than 3000, and about 150 teachers were involved in online courses (very close to the target).
- The TRANSFORM practice represented a shift in teacher professional self-image for RRI teaching to be part of their repertoire.
- After this practice, **teachers could play the role of mentors and become 'expert RRI teachers'**, guiding more novice teachers who are working on the earlier stages.
- The Transform practice represented a very valid input for Open schooling oriented projects that can be launched in the forthcoming years.

With respect to <u>combining the materials and activities produced in P3 with the ones of P1 and P2:</u>

- A stepped approach to inquiry by introducing teachers to the project principles of RRI emerged, based on a set of 10 processes which became learning objectives:
 - 1. Define questions
 - 2. Analyse patterns
 - 3. Draw conclusions
 - 4. Communicate ideas
 - 5. Justify opinions
 - 6. Critique claims
 - 7. Interrogate sources
 - 8. Use ethics
 - 9. Estimate risks
 - 10. Examine consequences
- Use of ENGAGE materials spread to 80 countries, based on data of downloads from the website. In Vietnam, China, Peru, Columbia and Uruguay, we have received direct reports of schools taking up ENGAGE and embedding into their curriculum (this use is also increased thanks to the accessibility to the materials beyond the English-speaking world).
- Cyprus, Romania, Greece and the Netherlands, partners have managed to incorporate ENGAGE into both undergraduate and post-graduate initial teacher training, and Masters courses for teaching and science communication.
- In the research into teachers' pedagogical content knowledge (PCK), it was found that using ENGAGE materials enabled some teachers to successfully develop new instructional strategies for addressing socio-scientific issues.
- ENGAGE materials **influenced curriculum policy in the UK**, working with the largest awarding body (AQA) to incorporate ENGAGE's 'RRI curriculum' into its Science Syllabus for 11-14 year olds.
- In 2017 ENGAGE won a worldwide Open Education award for its materials.
- Comments on the website provided evidence ENGAGE makes science lessons highly motivating for students.

4.6 FoTRRIS - Fostering a Transition towards Responsible Research and Innovation Systems

Project summary: The main objective of FoTRRIS is to develop and introduce new governance practices to foster Responsible Research and Innovation (RRI) policies and methods in research and innovation systems. FoTRRIS performs in five different member states a transition experiment, i.e. an experiment to support the transformation of present-day research and innovation strategies into co-RRI strategies. In addition, because important present-day challenges are (at least partially) of a global nature, but manifest themselves in ways that are influenced by local conditions, FoTRRIS focusses on 'glocal' challenges, i.e. local/regional manifestations of global challenges and on 'local' opportunities for solving them.

Number of practices: 3

P1: Development of an online co-RRI platform

A1: This innovation method applied within the context of FoTRRIS project (coordinated by The Flemish Institute for Technological Research) referred to the development of a web based platform that guides the participation of innovation and knowledge actors through the process of co-designing RRI project concepts. The platform was created during WP2 (led by LGI Consulting in France). The rationale behind this practice did not place an emphasis on a specific RRI key, but rather emphasized the RRI holistic approach along with the principles of co-creation i.e. the co-RRI concept. The platform (available at http://ingenias.fdi.ucm.es/fotrris/home.php) finally offered the following services:

- Innovation services to facilitate interactions between stakeholders and to support knowledge actors to co-design RRI-projects (in order to realise co-projected visions of solutions to local manifestations of global societal challenges according to RRI methods and standards by following the co-RRI process architecture).
- Communication and dissemination of co-RRI activities and results.
- Storage of lessons learnt from past RRI projects, such as examples of co-RRI project concepts.

A2: The rationale for developing the FoTRRIS web based platform for co-RRI was to support users to work in a collaborative way, in real time, on the definition of a RRI project concept. The platform was also meant to support stakeholders to address 'glocal' challenges.

A3: For the development of the co-RRI platform, **a rapid prototyping was adopted** (based on both *Lean design* and *Scrum agile* development methodologies). An advantage of this adopted approach was that it helped to ensure that **the intended design and the implementation were coherent and evolved to fulfil users' needs.**

There were **short development cycles to test the features of the co-RRI-platform**. Preliminary testing had been performed prior to deployment of the first version and had been performed for each version in a laboratory environment.

An accessibility check and a gender check were also performed:



- Accessibility check: to check whether it was compliant with the Level AA Conformance to Web Content Accessibility Guidelines 2.0 (WCAG 2.0) of W3C2. These guidelines explain how to make web content accessible to people with disabilities. Level AA means that the site deals with the biggest and most common barriers for disabled users. That version of the platform was found to pass Level AA.
- **Gender check:** it examined pictures of the website, language use and assignment of functionality and roles (whether they depended on gender). Overall, the gender check reviewed that the pages of the web site were gender reflexive and contained no gender biases.

The co-RRI platform, in order to fulfil its aims and facilitate its sustainability and widespread use, had been built on top of free/open source software (FOSS), together with open standards and open protocols to facilitate interoperability.

Four types of actors were identified in the applications of the platform:

- 1. Users: everyone that accesses to the platform.
- 2. **Registered Users**: Registered users with profile "User FoTRRIS". They can co-work in the different projects which they have joined, edit the content of each collaborative document and use a chat tool for communicating with other users on the same document.
- **3. Hub Manager**: The administrator of the users of a co-RRI Hub. A co-RRI Hub in the platform is the place for hosting projects that are promoted by a Competence Cell (competence cells are described in P3). A responsible of the Competence Cell will take the role of Hub Manager in order to create new projects for the hub and manage the users that will participate in those projects.
- **4. Platform Administrator:** The user that manages all the functionality of the platform. This user can create new users, new hubs and new projects, and assign users to projects.

Finally, the 'methodology' of the platform specified a sequence of phases in the process of defining RRI projects. Each phase was implemented as a workshop with people representing different stakeholders, and coordinated by a co-RRI expert. The aim of the platform was to support users to prepare the phases and associated workshops by:

- collecting their results
- facilitating the process of summarising and making public the outcome of the process
- providing tools for co-edition of documents and user interaction
- publishing in an integrated framework.

A4: No information available.

A5: No information available.

A6: It should first of all be stated that **this platform placed an emphasis on collaboration (an online collaborative tool)**, while at the time when the FoTRRIS project was conducted **no specific <u>collaborative</u> platform for RRI existed**, since the RRI project features cannot be managed using typical project management tools.

Then, the co-RRI platform had a major impact by **constituting a co-RRI hub and a method for the co-design of transition experiments**. It supported the transition experiments that took



place in WP3 of the FoTRRIS project, since each project concept was developed through a process involving the performance of three workshops, and these workshops were supported by the platform services (creation of the platform \rightarrow workshops \rightarrow transition experiments).

Moving even further, the platform also had a considerable impact outside the context of the project per se, since it was employed in a Master course at the Complutense University of Madrid (UCM). A group of around 35 students has been using the platform to carry out the definition of different research projects. The platform was also evaluated during this course of the Master, with more than 30% of the users evaluating the experience as *very positive* or *positive*. Concurrently, it was evaluated by the members of the UCM competence cell, that considered it as sufficient for supporting the transition experiments.

P2: Co-RRI Transition experiments (TEs)

A1: During WP3 of the FoTRRIS project, six transition experiments were carried out in five countries of FoTRRIS partners for putting the concept of co-RRI into practice. Transition experiments were described as *experiments to support the transformation of present-day research and innovation strategies into co-RRI-strategies*. The organization of the experiments was primarily coordinated by ESSRG-Environmental Social Science Research Group (based in Hungary). Each transition experiment worked on a different theme (described in the table below).

No	Co-RRI transition experiment	Country
1.	Sustainable and social just food supply within the region of Graz	Austria
2.	 Materials building and demolition waste and building materials (case 1) materials composing electric and electronic devices (case 2) 	Belgium
3.	Local Economic Development	Hungary
4.	Sustainable Energy	Italy
5.	Refugees	Spain
6.	Women with disabilities	Spain

Table 11. The transition experiments of FoTRRIS project

A2: In general terms, the objective of the transition experiments was to practically apply the concept of co-RRI and build sustainable co-RRI agendas. However, each specific experiment has a more specific objective and rationale behind its implementation, according to the characteristics of the substantive issue addressed in each country/case and the context in which it was embedded (the specific objective of each transition experiment is stated in A3 along with the policies applied within each experiment).

A3: Each transition experiment followed a different "methodological procedure" in correspondence to its context. The table below (Table 7) depicts the main procedures and policies/strategies within each experiment, while the complete description of the



experiments/co-RRI project concepts is available at <u>Deliverable 3.1</u>. It should be noted that **all transition experiments included various workshops** which are essential elements in participative and co-creative trajectories, **and they all relied on the use of the online co-RRI platform.**

Co-RRI transition experiment (country)	Policies/Strategies
Sustainable and social just food supply within the region of Graz (Austria)	 Main collaborator – 'competence cell' for the experiment: <i>IFZ</i> - <i>Interdisciplinary Research Centre for Technology, Work and Culture</i>. Examination of the topic of food from diverse angles - production, distribution, consumption or education. involvement of a variety of actors (people with personal and professional interest): food activists, CSAs – community supported agricultures, authorities from the city of Graz, advocacy groups like the chamber of agriculture, biological farming or responsible people from e.g. large-scale kitchens and people with an educational focus, farmers
	 Four workshops were conducted: Systems mapping: The aim was to get a common understanding of sustainability and systemic transformation in relation to the actual food system and to define measures to change the current system. The sustainability curve was employed to map the current system (with actors and initiatives who characterize the system). Visioning: The aim was to define and prioritize four concrete project ideas (a good and effective number) from all the measures that were identified in the first workshop. A common vision was elaborated for the projects, as well as a timeframe for the vision (up to 2022). Some aspects discussed in relation to the vision were: networking/cooperation, economic models, legal framework, use of resources, catering in public amenity, private consumer behavior. Then they were prioritized (according to the Wheel method) in four main topics: educational/training measures, food incubator, food strategy and innovative marketing channels. Finally, a stakeholder mapping in line with the four topics was conducted for including relevant people in the processes. Project concept design: The aim was to elaborate the already identified measures (four topics) from workshop 2. There were 20 participants who worked in small groups for defining which problems should be exactly solved with a particular measure. Then, there was a definition of goals
	 on two levels for reaching the targeted measures: activity-oriented goals and specific sub-goals with corresponding activities (a target oriented collaboration). 4. Status quo: The same participants as in workshops 1-3 were invited and were introduced to the web-based platform (P1). The idea of the workshop was to define specific actions together within the framework of Horizon 2020 calls (e.g. different geographical levels – local and

	global/international, open innovation, European cooperation, co-
	creation, cooperation between different groups – Quadruple Helix) in
	order to get a more precise project idea. At the end of the workshop,
	participants expressed their desire for having a format (e.g. a regulars'
	table) for networking and exchange in the near future.
	• Outputs of the workshops: a strong network was built up for all the
	participants, and three thematic foci emerged with a bundle of definite
	activities (some very elaborated, some less elaborated).
Materials – building and	• Main collaborator – 'competence cell' for the experiment: VITO – Flemish
demolition waste, building	Institute for Technological Research
materials, materials in	• The main theme "Materials" was broken down to two cases; building and
electric and electronic	demolition waste and building materials (case 1) and materials composing
devices (Belgium)	electric and electronic devices (case 2).
	- Case 1: The 'problem owner' was the City of Antwerp. FoTRRIS
	experiment was linked with certain ongoing developments at city level
	(e.g. logistics of building and demolition waste, the renovation and
	redevelopment of Antwerp's 19th and early 20th century
	neighbourhoods) and positioned itself as an exploratory track. Finally,
	one of the most challengind neighbourhoods in Antwerp was selected:
	Kiel.
	- Case 2: The 'ownership' for case 2 was more challenging, since the
	materials mentioned in the case consist of various 'loops' (e.g. repair.
	recycle etc.) and can be organised by cities or provinces as well as at
	regional (Elemish) and national (Belgian) level in the end
	representatives from the region of Flanders supported the nurnose of
	the transition experiment and/or participated in the workshops of the
	experiment (e.g. CSOs organizing 'Renair Cafes' and Unicore which is a
	company-world leader in recycling metals)
	Three workshops were conducted:
	1. Introductory plenary exercise:
	- MISC (method 1): The MISC curve was used in an introductory exercise
	which was meant to get people acquainted with the organisations
	represented in the workshon. Then, the workshon's participants
	worked in two senarate grouns: one discussing sustainable housing
	and one working on sustainable electric and electronic device
	- Fnvisioning (method 2). This eversise was meant to give all
	narticinants an idea about the richness of a concent such as
	'sustainable housing' All interpretations written down by the
	narticinants could be seen as complementary criteria composing a
	vision on sustainable housing. These criteria were structured along the
	following omboddod systems: building materials > bouse >
	neighbourbood
	- Actor manning (method 2): The actors were estagorized along the
	four nillars of the guadrunia balivy nation, science and education
	business and civil society expensions
	business and civil society organisations.
	- iviapping barriers method 4) - part 1: The barriers were grouped in 9
	categories (e.g. judicial frameworks, culture, geographical factors) and
	were complemented with insights from recent reports on building and
	demolition waste and building materials in a circular economy.

	2.	Explanation and mapping: Firstly, there was an explanation of all the definitions, remarks and ideas collected during the envisioning
		exercise. Additional items were added, so that the visualisation could be optimized (e.g. an extra circle on sustainable production). Then, the
		mapping process followed:
	-	Mapping barriers (method 4) – part 2: The diagram with barriers was
		presented to the 'domestic comfort' group. Extra barriers were
		included in this diagram, and participants were asked to link their
		organization with the barriers that stop their organization from
		visualize the complexity of the challenges ahead. The same exercises
		were also done by the group working on 'sustainable housing'.
	-	<i>Mapping leverages (method 5)</i> : The leverages referred, for instance,
		to finance or marketing. However, the group working on 'sustainable
		housing' did not define any leverages and they immediately began
		developing a project concept. Then, all the comments were translated
		into a more elaborate project proposal (emailed to the participants
		before workshop 3).
	3.	Project proposals: Due to the different approaches during the second
		workshop, the two groups had to follow a different program in the
	_	Evaluating the project proposal (method 6) and Formulating
		alternative proposals (method 7) for the group working on
		'sustainable housing'. They had to to evaluate the proposal along
		seven axes and then to jointly define alternatives (along with their
		strengths and weaknesses) that would improve the proposal.
	-	Scenario exercise (method 8) for the group working on 'electric and
		electronic devices'. They were asked to dream a future (a general
		vision of making home comfort accessible for everyone taking into
		account the scarcity of materials) in which the barriers they had
		their vision had become reality. The group was split up for this evercise
		according to gender, hence men and women worked on it separately
		Having dreamed this future, the participants were asked in a next step
		to rate on a scale from 1 to 10 where they were standing at that time.
		During the last exercise, participants had to define research questions.
	• Ou	tputs of the workshops: Regarding the group working on 'sustainable
	ho	using', the most concrete plan was for that moment to develop with this
	gro	up of people, under the leadership of VITO, a H2020 project out of the
	cur	rent proposal. With regard to the outcomes of the group working on
	su: abc	but how and when these could be nicked up again (lack of concreteness)
	abt	
Local Economic	• Mai	n collaborator – 'competence cell' for the experiment: ESSRG –
Development (Hungary)	Envi	ronmental Social Science Research Group and Transition Wekerle,
	whi	ch is a bottom-up initiative by local residents of Wekerle, Budapest that
	emt	praces activities regarding energy use, food consumption, use of public
	spac	ces, community building and solidarity.



 The main theme chosen was Local economic development, in order to co-develop an overarching economic concept for strengthening the economic autonomy of the activities carried out by Transiton Wekerle. All events organised were open to all interested local actors. All events organised were open to all interested local actors. All events organised were open to all interested local actors. All events organised were open to all interested local actors. All events organised were open to all interested local actors. A variety of actors was involved; experts, community members and researchers, who were expected to be pro-actively and flexibly find and adapt their own role(s) during the process. Three workshops were conducted: Systems mapping: The aim was to co-define the aim and function of local economic development in Wekerle; local economic development in Wekerle should benefit the local community of Wekerle by strengthening community ties through economic activities. In addition, the actors of the local economy in Wekerle were collected and classified as either regime actors (well integrated in the current economic system) or niche actors (alternatives to the current institutional logic). The next exercise referred to collecting the barriers and leverages regime and niche actors face when attempting to work towards sustainability (e.g. lack of development in Wekerle. A sequential process was designed starting from a reflection on previous workshop achievements through an individual and small group (of three participants) reflective exercise on the future wanted. The role of leaders and leadership was also highlighted in the aspired future. <i>Project concept design:</i> A professional story-teller was involved who developed a fairy tale like story of Wekerle, so as to mirror the substantive achievements of the workshop process and, deliberately, pave the way for an action pla
plans and one of them is an operating enterprise (WEKI co-working
office), while local networks were extended beyond Wekerle
- Transition Wekerle and the local government of Kisnest developed
a sustainable food strategy for the whole district of Kispest narthy
learning from the multiple initiatives thriving in Wekerle.
- In cooperation with the Corvinus Science Shop (based at Corvinus
Business School, Corvinus University of Budapest). a course-based
bachelor student project on Wekerle was initiated mentored by a
professor of brand management. Within the brand management

	course, groups of bachelor students have worked on the development of the concept of the "Wekerle-brand".
Sustainable energy (Italy)	 course, groups of bachelor students have worked on the development of the concept of the "Wekerle-brand". Main collaborator – 'competence cell' for the experiment: CESIE (European Centre for Studies and Initiatives in Italy) The aim was to map the system and experimental initiatives relevant to the theme of Sustainable Energy, and to facilitate the interaction between research, innovation and local development actors and the representatives from the rural communities concerned (policy, business and citizens). The experiment was related to the area of Madonie, in the centre of Northern Sicily. An 'energy transition arena' in the Madonie mountains was to be promoted, within the drafting process of the National Strategy of Inner Areas (SNAI). As a result of the transition experiment the Madonie Living Lab project concept was created, and was seen as a catalyser of innovative sustainable processes (e.g. energy services, technologies through an interaction with local authorities, local companies, professionals, trainers, technology provider etc.) A systemic, user-driven approach was adopted and actors from the quadruple helix groups were invited to the workshops. Three workshops were conducted: Systems mapping: A participatory approach was pursued, and researchers as well as facilitators of sustainable development processes had started a few months before the first workshop to interact with the local communities. 20 stakeholders from the quadruple helix entities who had already been involved in the consultation process on the glocal challenges of the National Strategy for Inner Areas (SNAI), were invited to join the energy transition arena. The first workshop allowed to map all the stakeholders and interesting experimental initiatives. Furthermore, contributions to the goal related to resilient energy communities in rural areas were collected, and the role of governance institutions and private actors was highlighted. At the end, participants tr
	 an eco-system of solutions to local challenges. 2. <i>Visioning:</i> The aim was to design a future scenario to be achieved using as leverage the potential identified (in terms of governance, innovation, community resilience, efficient use of resources, cooperation) and
	removing existing barriers, and to proceed to an inventory of solutions identification of priority interventions. 25 stakeholders participated in the workshops and discussed in small groups of 5-7 people. Three
	themes were elaborated in the discussions: a) How to achieve the citizens' engagement to a responsible behaviour in the energy field and co-design sustainable and responsible local development, b) How to match effectiveness of innovation products and services with the social spill-over effects in terms of quality of life improvement and c) Participatory governance and business models to maximise the local

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	3. Project concept design: The aim of the third workshop was to introduce
	the project concept developed by the FoTRRIS competence cell and
	SO.SVI.MA (a local development agency) to a restricted audience,
	consisting of about 12 people (including researchers, SOSVIMA
	development agents and representatives from companies, policy and
	citizens), so as to elicite the co-design of the steps to be taken: the
	timeline, the resources needed, the risk analysis and management and
	the communication initiatives. The project concept employed the Living
	Lab approach to establish MaLL – Madonie Living Lab. MALL was meant
	as a territorial innovation hub in which all actors of the Inner Areas
	Strategy would participate, and as a network of physical and virtual
	spaces for the development of suitable solutions for glocal challenges.
	The process for the implementation of the MaLL project would include
	four main steps:
	1. Vision at the political and administrative level and participation to
	maximise local value creation, raising awareness and community
	empowerment
	2. Knowledge and design thinking (analysis of data, promotion of idea-
	generation initiatives)
	3. Demonstration of appropriate technologies in relevant, open
	environments
	4. Business models (attracting investors and partners, project financing
	and crowdfunding, cross-sector engagement, co-ownership)
	Outputs of the workshop: The Madonie Living Lab project concept was
	presented to the European Network of Living Labs and Open Living Lab
	patienal initiatives and exchange practices
Pofugoos (Spain)	Main collaboratory (competence coll/ for the synariment) Complytones
Kerugees (Spain)	University of Madrid (IICM) and the Association BPI Ibero-America
	Background context: the challenge of migration as a key issue in
	buckground context. the chancinge of migration us a key issue in
	Furopean policies , while both pan-European and national authorities fail
	European policies , while both pan-European and national authorities fail to give asylum and guarantee the basic human rights for millions of
	European policies , while both pan-European and national authorities fail to give asylum and guarantee the basic human rights for millions of persons escaping from war and conflict areas
	 European policies, while both pan-European and national authorities fail to give asylum and guarantee the basic human rights for millions of persons escaping from war and conflict areas The goal of the experiment was to collectively design a refugee R&I
	 European policies, while both pan-European and national authorities fail to give asylum and guarantee the basic human rights for millions of persons escaping from war and conflict areas The goal of the experiment was to collectively design a refugee R&I project, including both R&I actions, with the aim to respond to a
	 European policies, while both pan-European and national authorities fail to give asylum and guarantee the basic human rights for millions of persons escaping from war and conflict areas The goal of the experiment was to collectively design a refugee R&I project, including both R&I actions, with the aim to respond to a potential project call at European level.
	 European policies, while both pan-European and national authorities fail to give asylum and guarantee the basic human rights for millions of persons escaping from war and conflict areas The goal of the experiment was to collectively design a refugee R&I project, including both R&I actions, with the aim to respond to a potential project call at European level. Intention to foster the participation of refugees, civil society members
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	while leverages and barriers in relation to R&I policies in Europe were
	discussed. The curve of sustainability was adjusted to the refugee case,
	a method that helped workshop participants to see how all the societal
	actors are interconnected, and that sustainable solutions require a more
	resilient approach.
	2. Visioning. The main task was visioning solutions towards a conective
	a more welcoming and tolerant European society accenting
	"otherness". During the workshop small work groups/partner teams
	produced 5 different project proposals, reducing the large number of
	individual/couples' ideas from workshop 1. The concepts that emerged
	were:
	- Creation of a database (variables of asylum seekers, variables of
	natural disasters and armed conflicts etc) with the aim to manage
	better the global migratory policies and discover the safer countries for
	transit and destination.
	- Operative proceedings adapted to the situation of refugees (a 2-years
	plan applicable to refugee camps, countries of origin, transit, and
	destination.
	society by means of art
	 Considering the benefits of immigration in the destination context as
	the focal point
	 Research based in refugees' life stories in Turkey
	3. Project concept design: Participants in the third workshop were invited
	to work in a specific refugee project proposal adjusted to the
	requirements of the new Horizon 2020 R&I calls for 2018, while the
	ideas generated in the previous workshops were seen as the starting
	point. Moving further, participants worked on two different issues:
	refugee narrative on todays' media and refugees' inclusion on urban
	regions. Some considerable actions complementing the project were
	developing direct and indirect refugees' studies (e.g. focus groups) and
	using social media as main tools of content creation and raising social
	awareness.
	and asylum seekers' necessities and problems was gained. Then with
	respect to the networks created in the workshops, they shared
	communication at conferences (e.g. ECREA Migrations and Media
	Conference in Bilbao-2017) Finally, the consequent aim was to develop a
	Refugee research and innovation project based on RRI principles.
Women with disabilities	• Main collaborator – 'competence cell' for the experiment: Complutense
(Spain)	University of Madrid (UCM) - the Association RRI Ibero-America
	• The context of the experiment was women and disability . The aim was to
	identity the needs, problems and opportunities that this group of people
	then design a women and dischility project to reasonal to a future
	then design a women and disability project to respond to a future Horizon 2020 project call



	•	The quadruple helix approach was employed for "determining" on the participants (20 in the end); intention to foster the participation of women with disability, civil society members and organizations and private companies (gender balance was also taken into account).
	•	Three workshops were conducted:
	1.	Systems mapping: The aim was to develop a research and innovation project proposal related with women and disability, using the principles
		of RRI. The same process as in the refugee workshops was followed, only that the sustainability curve was adjusted to the new case (i.e. women and disability).
	2.	Visioning: The same process as in the refugee workshops was followed (visioning solutions towards a collective project proposal and a more welcoming society with respect to the women and disability issue)
	3.	<i>Project concept design:</i> Participants worked on a specific project proposal, which ideally should be adjusted to the requirements of the new Horizon 2020 R&I calls in the next years. The main goals were specifying the objectives and structuring a core plan.
	•	Outputs of the workshops: A deeper perspective of women with
		disabilities was gained, and since this was a transition experiment the
		consequent 'plan' was to continue with this RI topic and human
		collective and develop a real RRI sustainable project.
Table 42 Gradients	1 1	

Table 12. Strategies/policies taken place within the context of the five transition experiments of FoTRRIS

A4: Several collaborations/cooperations with a variety of actors took place within the context of the transition experiments (or there were certain correlations with previous projects):

- 1. Sustainable and social just food supply within the region of Graz (Austria):
- IFZ Interdisciplinary Research Centre for Technology, Work and Culture was the collaborator/competence cell for the Austrian transition experiment (a more detailed description of the competence cells follows in P3).
- Additional workshops on food sovereignty were organized in collaboration with the **Austrian-wide Nyéléni Forum**.
- **Collaboration with 30 stakeholders** (local politics, food activist, representatives of civil society, etc.) in the district of Jakomini (Graz), where the focal points referred to farmers' market, food-coop and community gardening.
- A correlation with the previous project Foodlinks Knowledge brokerage to promote sustainable food consumption and production (e.g. adaptation of the project's prioritization method "the Wheel").
- 2. Materials building and demolition waste, building materials, materials in electric and electronic devices (Belgium)
- After a presentation of the project, there were **contacts with a key individual representing a Belgian company** dealing with recovering scarce metals from, amongst others, laptops and mobile phones.



- A similar contact took place with an individual from the City of Antwerp who had made clear that the city wants to invest in a more sustainable way of managing building and demolition waste.
- A collaboration with the Antwerp City Lab 2050, an innovation lab that could accelerate a further uptake of this initiative within relevant Antwerp and Flemish communities.
- 3. Local Economic Development (Hungary)
- The EU-funded TRANSIT FP7 project provided an opportunity to analyse the Transition Wekerle case, since the prior scientific analysis of this project provided needed inputs/insights in order to establish a co-creation process between researchers and local participants.
- A cooperation with Wekerle Library and Cultural Centre, that hosted the workshops.

4. Sustainable energy (Italy)

- For the organization and realization of the Italian Transition experiment and especially of the third workshop, there was a collaboration with the local development agency SOSVIMA, the CESIE staff and ARCA University Business Incubator in Palermo.
- The project developed within the context of the third workshop capitalized on the results of other EU-funded projects and initiatives (STS-Med, ZERO-PLUS, HABITATS).

A5: Different challenges and obstacles were present in the context of the transition experiments: More specifically and in relation to the first transition experiment:

- 1. Sustainable and social just food supply within the region of Graz (Austria):
- **Competition with other research organizations** working on the same topic(s) (of sustainable food system, mainly in relation **to networks and funding** (who is getting the money, who is able to involve whom in projects, etc.)

A6: All the transition experiments and their corresponding workshops managed to:

- Bring the co-creative and transdisciplinary way of doing research into practice.
- Introduce new governance practices attuned to local needs, values and opportunities.
- Mobilize and connect local stakeholders.

With respect to each case, the impact achieved was differentiated and dependent on the transition experiment's goal and context. What has been achieved in each experiment, as well as more details on what is expected to be achieved in the near future can be found in A3 and Table 7, where the outputs of the experiments and corresponding workshops are reported.

P3: Creation of competence cells

A1: Within the context of the FoTRRIS project and during WP2, a **competence cell** was established in each of the regions or countries where one of the partners experimented with co-RRI. These competence cells **are conceptualized as an organisation**, or a well-defined part of an (already existing) organisation, fostering the transition towards more responsible research and innovation systems. The design of the cells was coordinated by LGI Consulting (France). Five competence cells were created:

- Austrian competence cell (located in Graz, Austria): IFZ Interdisciplinary Research Centre for Technology, Work and Culture (a research and service unit embedded in IFZ).
- Flemish competence cell (located in Mol and Antwerp,Belgium): VITO The Flemish Institute for technological research (a research and service unit embedded in VITO).
- 3. Hungarian competence cell (located in Budapest, Hungary): *ESSRG Environmental Social Science Research Group* (a small research and development enterprise owned by four researchers).
- 4. Sicilian competence cell (located in Palermo, Italy): *CESIE European Centre of Studies and Initiatives* (the Higher Education and Research Unit of CESIE)
- 5. Spanish competence cell (located in Madrid, Spain): UCM Complutense University of Madrid and the non-profit Association RRI Ibero-America.

A2: The rationale underlying the development of the competence cells was that **they would function as experienced centres for the facilitation and management of co-RRI. Each cell had a separate, more specific objective:**

- 1. Austrian competence cell (IFZ): Its aim is to promote a short-term mission of integrating co-RRI as a transversal competence across all research areas within IFZ. The long-term mission is to introduce co-RRI approaches in the R&I landscape of the region of Graz.
- 2. Flemish competence cell (VITO): The mission of this embedded cell is double. On the one hand, it will work together with other research and innovation actors in Flanders towards the establishment of the coordinating entity mentioned above. On the other hand, it will also have the mission to perform co-RRI projects and to further invest in the development of a variety of means to connect and mobilise relevant societal actors in Flanders. The combination of the above will RRI in Flanders and create a shared knowledge base on RRI.
- 3. Hungarian competence cell (ESSRG): This cell and its activities strive for social justice and ecological sustainability. Its objectives refer to:
 - cultivating a cross-boundary research in a transdisciplinary fashion
 - cultivating a cooperative research approach, involving various communities
 - and stakeholder groups, while paying attention to those voices that are typically marginalized



- promoting process facilitation for collaborative science-society efforts and innovation processes of participative problem definition and analysis (by working along with citizens and stakeholders)
- 4. Sicilian competence cell (CESIE): Its aim is to contribute to the sustainable development of the region and local growth / positive change (in the social, economic & political spheres), and to promote educational innovation, participation and growth based on the co-creation, openness, and inclusiveness.
- 5. Spanish Ibero American competence cell (UCM): Its mission refers to promoting changes in the R&I system to generate RRI initiatives in the Latin-American countries:
 - To expand the principles and ideas of RRI in Latin-American, Portugal and Spain.
 - To facilitate the application of RRI where it is already known (Portugal and Spain).
 - To develop and **implement the concept of RRI further** and provide a base for research, sharing and training on these issues.

A3: Various procedures took place for the creation of the competence cells. First of all, there was an interrelation with the previous stages of the FoTRRIS project and the design of the competence cells had benefited from a few other project tasks;

- The **review of the literature on RRI** and the development of the co-RRI concept **(WP1)** imagined by FoTRRIS partners laid the foundation of the competence cells
- **The transition experiments (WP3)** offered the possibility to test what these competence cells could look like, what their operational model could be and if they were desirable rom the point of view of external stakeholders.

Moving further and in relation to the cells' business model, **Osterwalder's definition of a business model functioned as a basis** ("a business model is a conceptual tool that contains a set of elements and their relationships and allows expressing a company's logic of earning money"), **along with the popular tool for defining business models, the Business Model Canvas (BMC)**. The BMC methodology **breaks down a business model into nine building blocks, and the competence cells followed the same structure and finally included these nine building blocks:** Key Partners, Key Activities, Key Resources, Value Propositions, Customer Relationships, Channels, Customer Segments, Cost Structure and Revenue Streams. The business model of the competence cells (in this case called **'activity model'**) was after all

formed after discussion between LGI and the FoTRRIS partners and six main actions:

- 1. Representing the issue & making it concrete
- 2. Raising key questions
- 3. Brainstorming
- 4. Giving examples and/or proposing activity models
- 5. Framing the development of an activity model
- 6. Reviewing the activity models

Then, the following actions took place for finalizing the activity models of the cells and the overall principles of their organisation:



- Workshops during plenary meetings (Graz, Budapest, Madrid)
- Specific workshop with the Coordinator (Brussels)
- A 1st questionnaire about their activity model
- A toolkit to be used during their outreach workshop to frame the discussions on their activity model
- A final template to report about their activity models

A4: As already reported in A3, for establishing the activity models of the cells, there was a heavy reliance (correlation) to Osterwalder's definition of a business model and to the Business Model Canvas (BMC).

A5: No information available.

A6: All competence cells brought up considerable changes in various contexts; they **fostered and upscaled RRI practices in their regional and national research and innovation landscapes**, and therefore **promoted standard definitions and practices of RRI across the EU**. Moving further, in terms of future and **expected impact** it has been stated that:

- Since competence cells are new spaces entirely dedicated to RRI, they lay the foundation for structural change within the R&I landscape.
- The competence cells are **expected to become meeting points between research and innovation practices and policy making**, and new interactions and new ways of working together will be promoted.
- Since these competence cells will deal with 'glocal' challenges, they will promote a variety of actions at the local level for the global challenges European countries are facing.



4.7 INHERIT - Inter-sectoral Health and Environment Research for Innovation

Project Summary: INHERIT is about stimulating effective policies, practices and innovations that address key environmental stressors of health and the underlying causes of health inequity. Among others, the project raises awareness amongst policy makers and the general public about (un)sustainable lifestyles and behaviours and how they impact the environment, health and health equity, builds capacity and encourages leadership from the health sector to work inter-sectorally with the environment and other sectors, and uses the evidence base to advocate, and mobilise key actors to implement the identified solutions.

Number of practices: 3

P1: Online Database of Promising Practices related to "living moving, consuming" (INHERIT Database)

A1: The INHERIT database was created during WP2 of the INHERIT project, and its development was coordinated by Prolepsis - Institute of Preventive Medicine Environmental & Occupational Health (based in Greece). It is now available on the INHERIT website (at https://www.inherit.eu/db-results/). The database provides an idea of measures that can be taken that simultaneously protect the environment, improve health and help reduce health inequalities (triple-win cases). It includes promising practices related to three areas:

- 1. Living (green space, housing)
- 2. Moving (active support)
- 3. Consuming (food)

A2: The rationale underlying the creation of this database was **to provide an online resource of promising practices that encourage people to adopt behaviours that contribute to environmental sustainability, to better health and to reducing health inequalities**, as well as **to inspire further uptake** and implementation of the kinds of practices included.

A3: Within the context of WP1 of the project, partners conducted a 'Baseline Review' providing a good understanding of the interactions between key environmental factors, health and well-being, inequality, lifestyles and behaviours across Europe. They identified over 100 'promising practices' - interventions, programs, services, or strategies. Then, a number of these practices was selected by the INHERIT consortium members, based on jointly agreed criteria, and based on whether they were considered promising (and not "good", or "best") and showed potential (or "promise") for developing into a "good" practice.

A <u>scoring sheet</u> was created for the selection of these practices, describing the selection and evaluation criteria. **Ten criteria** that were described were:

- **1. Relevance** to one of the following areas:
- Living Green spaces





- Living Energy efficient housing
- Moving Active mobility
- Consuming food
- 2. Evidence of effectiveness (Basic) (e.g. no evidence of effectiveness, positive effectiveness based on subjective evaluation, basic level of effectiveness based on qualitative data etc.).
- **3.** Evidence of effectiveness (Advanced) (e.g. no evidence of effectiveness, strong indications of effectiveness with positive results based on pre and post or case-control comparisons with follow-up quantitative and qualitative methods etc.).
- 4. Fulfillment of objectives and goals
- 5. Positive effect on:
- Health/Well-being
- Social and economically vulnerable persons/groups
- Sustainable lifestyles and behaviors
- 6. Potential to be characterised as a 'triple win case' by targeting at the same time Health and wellbeing and Environmental sustainability and reducing Health Inequalities.
- **7.** Scientific evidence base underpinning the practice (such as scientific theory, methodology, literature review, meta-analysis, case-control study or randomized trial findings)
- 8. Basis of the practice on a logic plan and inclusion of three of the following:
- Analysis of problem tackled
- Needs assessment
- Target groups
- Objectives/outcomes
- Implementation method
- Evaluation plan
- Cost benefit analysis
- 9. Feasibility to transfer and inclusion of three of the following:
- Implementation guide exists
- Implementation costs known
- Information about the necessary human resources, skills and expertise available
- Identified barriers with solution recommendations
- Evidence whether and when the associated benefits overcome the costs
- Identification to which population groups and settings its applies
- 10. Feasibility to be pilot tested within the INHERIT Project

A4: No information available.

A5: No information available.

A6: INHERIT is an ongoing project, therefore it is **expected that this database** - through the information it provides and the examples of good practices- **will demonstrate a broader**, **positive impact outside the context of the project by changing behaviors or addressing harmful behaviors in relation to three areas;**

1. health and well-being



2. social equity (social and economically vulnerable persons/groups)

3. environmental sustainability

For instance, one of the promoters of the INHERIT practices has provided information on the **app called Questionmark** (includedin the database of the promising practices), that is already widely used in Netherlands and people there employ their mobile phone so as to **score food** in the supermarkets (there are links with certain big supermarket chains). The impact of this good practice-app can then be described under the terms of **awareness-raising (paired with health equity) and behaviour change.**

P2: Visioning and scenario planning (Future 2040 scenarios)

A1: The practice of visioning and the creation of future scenarios were developed during WP2 of the project and was coordinated by CSCP – Collaborating Centre on Sustainable Consumption and Production (based in Germany).

In general terms, scenario building is a strategic planning and decision-making process that involves the construction of methodologically researched future-oriented scenarios (Neiner et al., 2004). There are typically two to four scenarios to allow for comparison. In each scenario equally plausible, credible and logically consistent narratives describe what the future could potentially look like. Scenarios do not predict the future but rather illustrate possible futures (Fahey and Randall 1998; JRC, European Commission 2006).

Based on research about demographics, health, social inequalities and the environment, four positive scenarios of what Europe could look like in 2040 were developed:

- My life between realities
- Less is more to me
- One for all, all for one
- Our circular community

A2: The INHERIT scenarios presented points of reference for such a better future, and could therefore serve as a goal towards which policy making this future could be oriented. Therefore, their main objective was to develop healthier, more equitable and sustainable European societies by 2040. The future scenarios were developed for EU and national policy makers as well as other stakeholders interested in jointly building a better future for European citizens.

A3: The future scenarios developed within INHERIT project followed a specific building process comprised of seven steps, and depicted in the table below (Table 8):

Step	Short description
1. The setting of the scenarios	The focus was on the most relevant components of lifestyles as defined in the project, namely living (green space, energy efficient housing), moving (active transport) and consuming (food and beverages), as well as on actions, which create a triple-win for health, health equity and environmental sustainability.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824565

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2. Identifying and analysing the drivers	The trends and drivers that were relevant to the INHERIT triple-win areas of health, environment and equity were identified. For this trend research, the Social, Technological, Environmental, Economic, Political, Legal, and Ethical changes (STEEPLE) Horizon Scanning Approach was employed. The identification and scanning of the trends was done via desktop research by the consortium partners based on more than 40 specialised publications.
3. Ranking by perceived impact and unexpected uncertainties	The consolidated trends were presented to a pan- European group of 30 representatives from academia, civil society, policymaking and business during the INHERIT Future Scenario Workshop that took place on May 11th 2017, in Cologne, Germany. In a qualitative exercise, the experts rated the trends according to their perceived impact and their expected uncertainty for the INHERIT areas based on a simple 'high-medium-low' scoring system. The trends that would presumably have a high impact and low uncertainty were included in the future scenarios .

4. Setting the parameters	 Based on the ranking exercise of the previous step, the scenario building team (CSCP and EuroHealthNet with the support of the National Institute for Public Health and the Environment (RIVM)) decided on the two dimensions/axes along which the scenarios would be constructed. <u>1st axis - social dimension:</u> ranging from a society where individuals behaved as a collective, to an individualistic society where people behave as single decision makers within the society. <u>2nd axis - public or private sector:</u> representing the sector with the strongest influence in shaping society. This is related to the type of governance in a country (e.g. social/market oriented) and can lead to two extremes, one where private corporations and market mechanisms are the key drivers (private sector as the key driver), and the other where the Governments at EU, national and local levels determine the direction of social interactions (public sector as the driver). Therefore, each scenario placed the focus on a different axis: "My life between realities" - driven by the public sector with more individualistic social processes Den for all, all for one" - driven by the public sector with strong collectivism
5. Elaborating the scenarios	After identifying the key trends, the type of social and the main activities of the driving sectors in each scenario, the team developed narratives to illustrate the everyday life of a citizen living in the scenario .
6. Categorising the implications of the scenarios	A short narrative describing "the life of citizens in 2040" was included and four fictional citizens representing different socio-economic segments across Europe were created . Each of each of the four scenarios was linked to the INHERIT behaviour change model (further analysed in A4), by looking at the interplay of citizens and driving sectors regarding motivations, opportunities and capabilities to adopt and maintain healthy, equitable and sustainable lifestyles. A more detailed description of the



				characters can be found in the ' <u>Reaching the Triple</u> <u>Win report'.</u>
7.	Developing today	strategies	for	A final step to the INHERIT's scenario building exercise was the development of policies or action plans that lead towards the realisation of the desired future. Therefore, a policy Roadmap containing 20 policy interventions in the four lifestyle areas was developed.

Table 13. The building process of the	Future 2040 scenarios
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The development of these scenarios also entailed processes that promoted the RRI key of Public E ngagement. Citizens of five European countries - Czech Republic, Germany, Macedonia, Spain and United Kingdom – were consulted through a focus group exercise – household survey (a form of citizen consultation). This was conducted so as to gain qualitative insights into citizens' consumption habits, transport habits and their perceptions of the INHERIT future scenarios, as well as in order to explore similarities and heterogeneity in perceptions, motivation and practices across different and geographically disperse European countries.

A4: As mentioned in A3, each of the scenarios was linked to the INHERIT behaviour change Model. This model used as a source of inspiration the Behavioural Change Wheel (BCW). This model incorporates both the reflective system (central route) and automatic system (peripheral route, including habitual behaviours). It consists of three parts that can influence each other, and together influence behaviour - capability, motivation, and opportunity. Behaviour change strategies can target and change one or several components of the behavioural system.

The National Institute for Public Health and the Environment (RIVM) also contributed to the process of building the scenarios and 'constructing' their social dimensions.

A5: No information available.

A6: These future scenarios may not predict the future, but they raise awareness about the future and construct a broader image:

- They illustrate one or several narratives of what the future could potentially look like and allow for the creation and promotion of developments that would enable their realisation.
- They function as a source of inspiration for EU and national policy makers as well as other stakeholders to jointly shape a future which can tackle the full potential of the 'triple-win'.
- These scenarios (along with citizens' opinion expressed in the focus group exercise) resulted in a policy roadmap with 20 policy interventions related to the four lifestyles of the scenarios. These suggestions are a combination of top-down and bottom-up approaches and hard and soft measures, ranging from legislative, environmental and social planning to service provision or communication and marketing policy types (e.g. reducing private car use, securing big data etc.)



Concurrently, the focus group exercise that accompanied the future scenarios provided valuable insights on Europeans' mentality and conclusions regarding the current situation in Europe. For instance:

- Participants were mainly concerned towards the scenario attributes promoting health and environmental concerns, while health equity aspects were only marginally considered.
- When thinking about the **behaviour determinants** driving participants' preferences for the different scenario attributes, it emerged that the key ones **are financial motivation and convenience**, as well as availability and accessibility to services and **infrastructures in terms of opportunities**
- Family and social cohesion has also been repeatedly mentioned as a key factor influencing citizens' lifestyle patterns.

P3: Transformation of best practices into 15 case studies related to "living, moving and consuming"

A1: After identifying over 100 promising practices and including some of them in the online Database of Promising Practices - INHERIT Database (P1), some the promising practices in the database were adapted, transferred, scaled-up and/or underwent further evaluation as 15 case studies. They were related to the areas of living, moving and consuming. This practice took place during WP4 and WP5 and was coordinated by the Norwegian University of Science and Technology - NTNU. The total time frame for the implementation of the case studies was 20 months from September 2017 to April 2019 (in most cases the implementation lasted 10 months).

Table 14 depicts the case studies, the INHERIT partner that implemented them, as well as the country where they took place.

Case study	INHERIT partner	Country
1. Eco Inclusion	Federal Centre for Health Education (BZgA)	Germany
2. Food Garden	National Institute for Public Health and the Environment (RIVM)	Netherlands
3. Gardening with Green Gyms and Meat Free Mon	University College London, Health Equity Institute (UCL) day	United Kingdom
4. GemuseAckerde	emie Collaborating Centre on Sustainable Consumption and Production (CSCP)	Germany
5. Gent en Garde/STOEMP	Gezond Leven	Belgium



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6. Lifestyle e-coaching	Philips Electronics and Prolepsis	Netherlands and Greece
7. Malvik Path	Norwegian University of Science and Technology (NTNU)	Norway
8. Place Standard	Riga City Council and National Institute of Public Health	Latvia and The Republic of North Macedonia
9. PROVE	Lisbon University Institute (ISCTE-IUL)	Portugal
10. Restructuring Green Space	National Institute for Public Health and the Environment (RIVM)	Netherlands
11. Restructuring Residential Outdoor Areas	Swedish Public Health Agency (FOHM)	Sweden
12. Retrospective Analysis on Energy Efficient Investments	University of Exeter Medical School, European Centre for Environment (UNEXE)	United Kingdom
13. Sustainable Food in Public Schools	University of Alcala (UAH)	Spain
14. Thinking Fadura	Basque Centre for Climate Change (BC3)	Spain
15. UrbanCyclers	Charles University Environment Centre (CUNI)	Czech Republic

Table 14. The case studies of the INHERIT project

A2: The INHERIT case studies, which were spread across Europe, **aimed to encourage healthy behavior**, and/or address key environmental stressors for health, by encouraging people to change their lifestyles and behaviours and support the environment and sustainability.

A3: All 15 INHERIT case studies addressed the situation in a specific locality. Each examined an intervention, policy, initiative etc. that tries to change behaviour or lifestyle directly or indirectly in ways which will deliver a triple-win. The purpose of the evaluation was to establish whether the intervention actually delivers the triple-win.

The 15 interventions to which the case studies were related, were all chosen because they had theoretical potential to limit damage to ecosystems at global level and promote global sustainability. More specific criteria also existed:

- Should be knowledge based (combination of knowledge from users, experience, research)
- The underlying theory of change should be linked to the Common Analytical Framework (CAF):- Planned action intended outcome
- Should include cross/multi-sector-involvement
- Should involve users and other actors, ownership empowerment co-creation



- Should address at least one of the INHERIT areas of living, moving, or consuming.
- Actors responsible for implementing the intervention should be willing to commit and meet the resource requirements.
- **Scalability:** should involve the possibility to be more widely implemented for a larger impact on behaviour change
- Should **fall under one of the following categories:** a) existing policy or intervention that is ongoing, b) existing policy or intervention that has recently ended, c) an existing policy or intervention with added elements that will potentially improve its triple-win effects or d) introduction of an intervention or a policy to a new context.
- **Collection of new data should be done during 2018 at the latest**, allowing the reasonable expectation of interim outcomes being available by early 2019.
- Should target or have an impact on people facing socioeconomic disadvantages.
- Population affected should be of a suitable size for modelling or evaluation.
- **Resources** needed for implementation/evaluation should **not exceed the available budget.**

The implementation process was monitored, following specific steps. The steps for the monitoring process were:

- Implementation plan: Each responsible INHERIT partner was asked to make a Gantt chart that listed the activities and monitored their timing. Various elements related to public engagement were present. There was communication with target groups and or other audiences, meetings between the stakeholders involved and community participation was also registered including the use of social media (e.g. specific platforms, frequency of usage).
- <u>Template for reporting on the implementation process</u>: This template was to be filled out by responsible INHERIT partners in close collaboration with local implementers. The template covered a range of topics, such as main goals, actors and sectors involved in the implementation, strategic foundation, key activities and needed resources, barriers and facilitators to the implementation.
- <u>General information on the INHERIT case studies</u>: This included information from local implementers' websites, case descriptions provided by responsible INHERIT partners and materials already gathered in the INHERIT database. Some of the INHERIT case studies (n=8) received site visits from UCL (n=6), EuroHealthNet (n=1) and NTNU (n=1) to gain further insight into the INHERIT case studies.

The final structure of the case studies was shaped as follows:

- Link to one or more of the strategic areas of living, moving and/or consuming
- Local context, background and objectives
- **Contribution to the triple-win goals** of better health, increased health equity and more environmental sustainability
- Relation to the INHERIT Model
- Implementation process, according to actors and sectors involved (including user involvement) and key activities linked to the implementation process.
- Necessary resources
- Facilitators and barriers for the implementation
- Potential for transference and scaling



A4: For designing the **assessment of implementation process** of the case studies, **the Consolidated Framework for Implementation Research (CFIR) functioned as a basis** (a conceptual framework that was developed to guide systematic assessment of multilevel implementation contexts to identify factors that might influence intervention implementation and effectiveness).

When it comes to collaborations taken place within the context of the case studies, each INHERIT partner responsible for a case study in a country had cooperated with a local implementer that provided local expertise.

According to the promoters of the INHERIT practices, **unexpected** forms of collaboration also took place with certain **individuals that were involved in the case studies but were not actually involved in the INHERIT project**. For instance, during the case study *Sustainable Food in Public Schools*, **cooperation even with school's kitchen staff was necessary** for assuring the successful completion of the study.

A5: Certain **challenges/obstacles** emerged within the context of the case studies:

- **Difficulty in capturing experiences** from the case studies due to the diversity of the case studies.
- Loss of certain data-information: since local implementers informed responsible INHERIT partners, who in turn informed members of the research team at NTNU who wrote the report, some information is likely to have been lost during the data collection process.
- Resistance to change (changing a consolidated behaviour).
- **Financing** has always been an issue in case studies and, from the point of view of the individuals promoting INHERIT practices, and concurrently various **changes in policies and governments** can also create challenges.

A6: The INHERIT case studies **highlighted the variety of actions that can be taken to benefit the environment, health and equity in their respective populations**. Although some interventions targeted individual behaviour directly, most of them **targeted change at broader levels of society**.

Moreover, they **indicated the value of inter-sectoral collaboration and public engagement**, by collaborating with various groups of (local) stakeholders and volunteers as well; **the active involvement of citizens and target groups was a major facilitator** of ensuring a good fit among the target population, the intervention and the local environment. **Local systems** were at times affected as well, like within the context of **the case study** *Place Standard* where they are now planning a policy round table in the local system of Latvia and of the Republic of North Macedonia.

The overall potential impact of these case studies -along with the future scenarios- was to help ensure that EU citizens 'live within the limits of our blue planet' (European societies evolving in ways that enable all people to live and behave in ways that enhance quality of life).



4.8 RECODE - Policy RECommendations for Open Access to Research Data in Europe

Project summary: The RECODE project leverages existing networks, communities and projects to address challenges within the open access and data dissemination and preservation sector. The sector includes several different networks, initiatives, projects and communities that are fragmented by discipline, geography, stakeholder category (publishers, academics, repositories, etc.) as well as other boundaries. Many of these organisations are addressing the barriers to open access to research data, but they are often working in isolation or with limited contact with one another. RECODE provides a space for European stakeholders in the open access and data dissemination and preservation sector to work together and provide recommendations for a policy framework to support open access to European research data.

Number of practices: 2

P1: Case studies for the examination of open access and data preservation issues (related to four dimensions) through stakeholder engagement mechanisms

A1: Within the context of the RECODE project (coordinated by Trilateral Research, UK), case studies were used for examining open access and data preservation issues (from WP1 to WP4 of the project), and were related to four different issues/dimensions:

- 1. stakeholder values and inter-relationships
- 2. grand challenges, including infrastructure and technology issues
- 3. legal and ethical questions
- 4. institutional and governmental policy issues

In addition, the case studies referred to different scientific disciplines:

- particle physics and particle astrophysics
- health/clinical research
- medicine and technical physiology
- environmental science
- humanities (archaelogy)

A2: These case studies and their corresponding dimensions aimed to **identify shared concerns and elements of good practice from a range of disciplinary perspectives.** More concrete objectives are mentioned in A3/Table 10, when analysing how each specific issue/dimension was examined.

A3: Before analysing in more detail the strategies/processes for examining the open access issues in relation to each dimension, certain aspects should be highlighted:

• Differentiated strategies were applied according to the dimension taken into account (stakeholder values, grand challenges etc. – mentioned in P1). They did share however a similar rationale (literature reviews, interviews, workshops).



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- Stakeholder collaboration exercises and, generally, stakeholder engagement were seen as key-strategies.
- According to the promoters of the RECODE experiences, the rationale underlying the selection of the case studies was that there should be **cross-disciplinarity**, and **large scale data should be availble** (like in the field of physics). Also, the inclusion of social sciences (through the field of archaeology) allowed an even more in depthwork.

Table 15 illustrates what kind of processes took place when examining each dimension in the case studies.

Issue/dimension under	Strategies / Processes
studies	
 Examining open access and data preservation issues in relation to <u>stakeholder values</u> and inter-relationships 	 <u>Aim:</u> to understand stakeholder values and ecosystems in Open Access, dissemination and preservation in the area of scientific and scholarly data. <u>Processes:</u> document analysis of policy and related documents and protocols to map the formal expression of values and motivations. 29 interviews with key personnel to investigate values, motivations and barriers in the different disciplines as well as map their relationships with different stakeholders and organisations. A validation and dissemination workshop to better understand how to match policies with stakeholder drivers and motivations, so as to increase their effectiveness in promoting Open Access to research data. All the above processes relied on a stakeholder taxonomy, and stakeholders are categorized according to the five basic functions in the Open Access ecosystem: Funders and Initiators; Creators; Disseminators; Curators, and Users.
2. Examining open access and data preservation issues in relation to <u>grand challenges</u> , including <u>infrastructure and technology</u> <u>issues</u>	 <u>Aim:</u> to identify and report on infrastructural and technological barriers to Open Access and preservation of research data as identified by key stakeholder groups. <u>Processes:</u> <u>Categorisation of stakeholders</u> according to their experience and their response to challenges: Producers of research data, Disseminators/Curators of research data, Funders, End users of research data at large.

	- Literature review, consultation and analysis of
	a number of sources to scope the known
	technological and infrastructural challenges to
	Open Access and preservation of research data,
	and the possible existing solutions for their
	mitigation.
	- A scoping questionnaire to the broader
	stakeholder communities, to further explore
	the key issues identified in the literature review,
	i.e. areas of data heterogeneity, accessibility and
	discoverability etc.
	toward interviews with her individuals from
	- targeted interviews with key individuals from
	each of the five recode case studies, to
	technological issues they had encountered in
	their research practice
	 A validation and dissemination workshop as an
	official side event of the 10th Plenary Session of
	the Group on Earth Observations & 2014
	Ministerial Summit (so as to validate and discuss
	the research findings, and obtain additional
	feedback from representatives of the RECODE
	case studies and major international initiatives).
3. Examining open access and data	• <u>Aim</u> : to examine intellectual property rights
preservation issues in relation	(including copyright, trade secrets and database
to legal and ethical questions	rights, privacy and data protection and open
	access mandate) as well as ethical issues arising
	In relation to open access research data
	misappropriation and commercialization of
	research data unequal distribution of scientific
	results and disproportionate impacts on
	scientific freedom, economic/social/scientific
	costs.
	Processes:
	- A literature review on the impact of the issues
	above on a range of different individuals on the
	knowledge production spectrum (e.g.
	researchers, project managers, institutional
	representatives etc.)
	- 13 targeted interviews with key individuals from
	each of the five RECODE case studies, in order to
	elaborate on the legal and ethical issues they
	encounter in their research practice and in
	providing open access to research data.

	 A workshop on legal and ethical issues with stakeholders representing a number of different perspectives.
 Examining open access and data preservation issues in relation to <u>institutional and</u> governmental policy issues 	 <u>Aim:</u> to focus on the challenges faced by institutions, such as archives, libraries, universities, data centres and funding bodies, in making open access to research data possible. <u>Processes:</u> An identification of the key challenges: financial support; evaluating and maintaining the quality, value and trustworthiness of research data; training researchers and other relevant stakeholders; creating awareness on the opportunities and limitations of open research data. A review of policy documents, reports, scholarly literature, other relevant documents and websites to provide an overview of current institutional approaches to making open research data possible and the gaps between these approaches and practice. 15 interviews with key individuals from each of the case studies, including data centre managers, project coordinators and division managers. A one-day workshop with representatives from different stakeholder groups for validating the results of the previous analysis.

Table 15. The processes for examining each dimension in the RECODE case studies

A4: For conducting the case studies there had been various types of cooperation, or interrelations with projects that were concurrently conducted:

- For conducting the case study on particle physics, there was a cooperation with the Particle Physics and Particle Astrophysics (PPPA) Group of the Department of Physics and Astronomy at the University of Sheffield (the case study was conducted within this department)
- The case study on health/clinical research was conducted within the FP7 funded project EVA
- The case study on medicine/bioengineering was carried out with members of the Bioengineering Institute in Auckland, NZ and Virtual Physiological Human (VPH) Community.
- The case study on environmental science was carried out with the cooperation of six researchers within the Joint Research Centre, Institute for Environment and Sustainability, Digital Earth and Reference Data Unit (the researchers were interviewed).



• The case study on humanities (archaeology) was conducted through the cooperation of archaeologists working for Open context, which is a free, Open Access resource for the web based publication of diverse types of research datasets from archaeology and related disciplines (developed by the Alexandria Archive Institute and backed by the California Digital Library, USA).

Then, more specific synergies and/or correlations existed:

1. Examining open access and data preservation issues in relation to <u>stakeholder values</u> <u>and inter-relationships</u>

While examining each issue/dimensions, specific notions had to be framed. Therefore, there was a consequent correlation with previous declarations or official definitions (that functioned as a basis):

- Drawing on the **European Commission's definition of "Open Access"** as "free ... access to and use of publicly-funded scientific publications and data".
- Drawing on the **Berlin Declaration and to its statement related to Open Acces**s, in other words that contributions include original scientific research results, raw data and metadata, source materials, digital representations of pictorial and graphical material and scholarly multimedia material.
- Drawing on **the Berlin Declaration's vision of Open Access**, which is that Open Access to data has the potential to create "a comprehensive source of human knowledge and cultural heritage that has been approved by the scientific community.
- 2. Examining open access and data preservation issues in relation to grand challenges, including infrastructure and technology issues
- Interaction with key individuals / personnel in charge of managing the provision of research computing infrastructure and services CERN Large Hadron Collider (LHC) Computing Grid (these individuals were interviewed).
- 3. Examining open access and data preservation issues in relation to <u>legal and ethical</u> <u>questions</u>

The examination of the above dimension was **based on several regulations on data protection and open access:**

- Research use exception (GDPR Article 83)
- Right to erasure (GDPR Article 17(3))
- Amended PSI Directive on the sharing of public sector information
- Commission Decision 2011/833

A5: No information available.



A6: This practice had a considerable impact:

- It produced studies of good practice and exchanged good practice principles with relevant stakeholders and institutions in its networking activities and consensus building activities, as well as through its stakeholder engagement mechanisms.
- Its results also functioned as the basis for a set of guidelines related to the sharing of scientific data (P2).

P2: Policy guidelines for open access and data dissemination and prevention

A1: In February 2015, a set of guidelines that identify, promote and disseminate good practice solutions for the sharing of scientific data across the open access and data dissemination landscape was completed. The policy guidelines/recommendations targeted key stakeholders in promoting open access: research funders; data managers; research institutions; and publishers.

A2: The set of policy guidelines:

- Aimed at assisting stakeholders in furthering the goals of open access to research data in each of their organizations and networks.
- Were intended to be of a broad nature, so as to encourage the development of consensus-building and clarify relationships within the open access ecosystem where possible.
- Aimed at enabling attention to disciplinary, stakeholder or organizational specificity.

A3: Specific **processes** took place for formulating the policy guidelines/recommendations:

- RECODE incorporated the results of the case studies on four areas of work: Stakeholder values and ecosystems, Technological and infrastructural issues, Legal and ethical issues, and Institutional and policy issues. Concurrently, it examined these issues from the perspective of the stakeholders to whom the recommendations are addressed.
- It incorporated RECODE's overall findings, which focused on two overarching issues in the mobilisation of open access to research data: a lack of a coherent open data ecosystem; and a lack of attention to the specificity of research practice, processes and data collections.
- it conducted a review of scholarly literature, policy documents, and reports, significant work of other EC-funded projects (e.g. ODE, APARSEN, PARSE.Insight) and relevant documents to provide an overview of the current policies, practices and challenges for these stakeholders both in the EU and abroad.
- Before finalizing the recommendations, an earlier version of them was discussed at a workshop that took place in Amsterdam, on September 25th, 2014, in the frame of an RDA plenary meeting. Participants representing all four stakeholder groups to whom the recommendations are directed to, took part in the workshop.



The recommendations intended to be useful and accessible to both stakeholders with very developed open access policies that could be improved, and stakeholders with less developed policies. This is why they were supplemented with more specific recommendations for each stakeholder category. The stakeholder categories were:

- Research funders
- Research Institutions
- Data managers
- Publishers

The 'general', ten RECODE policy guidelines were the following:

- 1. Develop aligned and comprehensive policies for open access to research data.
- 2. Ensure appropriate funding for open access to research data.
- 3. Develop policies and initiatives that offer researchers rewards for providing open access to high quality data.
- 4. Identify key stakeholders and relevant networks and foster collaborative work for a sustainable ecosystem for open access to research data.
- 5. Plan for the long-term, sustainable curation and preservation of open access data.
- 6. Develop comprehensive and collaborative technical and infrastructure solutions that afford open access to and long-term preservation of high-quality research data.
- 7. Develop technical and scientific quality standards for research data.
- 8. Require the use of harmonized open licensing frameworks.
- 9. Systematically address legal and ethical issues arising from open access to research data.
- 10. Support the transition to open research data through curriculum-development and training.

However, sub-recommendations were also formed, according to the category of stakeholders they targeted:

Research Funders:

- 1. Develop explicit policies for open access to research data with clear roles and responsibilities.
- 2. Adopt a comprehensive approach in funding the implementation of open access to and preservation of research data .
- 3. Reinforce the significance of the Data Management Plan (DMP) to embed and promote data management as a distinct activity within the research process.
- 4. Raise awareness and promote open research data in view of leading an open science paradigm.
- 5. Foster collaboration with relevant stakeholders and networks.

Research Institutions:

1. Develop an explicit institutional research data strategy with open access as the default position.



- 2. Actively pursue collaborations between and within institutions in fostering a sustainable ecosystem and infrastructure for open access to and long-term preservation of research data.
- 3. Include open access to high quality research data as a formal criterion for career progression.
- 4. Develop educational and training programs for researchers and staff to improve data management skills and to enhance data-intensive research.
- 5. Raise awareness about the benefits of open access to research data and provide rewards.
- 6. Support the research community through the provision of legal and ethical advisory services.

Data Managers:

- 1. Assess their position within the open access ecosystem in view of developing collaborative infrastructures and services.
- 2. Develop sustainable business models to ensure long-term service provision.
- 3. Establish mechanisms for data quality that ensure re-use and long-term preservation through collaborative work .
- 4. Acquire certification/accreditation to guarantee high quality services in the long term.
- 5. Support data management through the development of training programs for researchers and librarians/ technical staff.

Publishers:

- 1. Gradually develop mandatory policies for open access to research data supporting publications.
- 2. Collaborate with certified repositories and data centers to streamline data submission.
- 3. Support data as a first-class scholarly output through the establishment of peer-review processes.
- 4. Develop policies requiring citations for research data.
- 5. Establish licensing policies that encourage the use of TDM.

A4: JRC (Joint Research Centre) provided an instrumental help, by reviewing the policy recommendations.

A5: No information available.

A6: This set of policy guidelines brought about a broad impact in the European landscape, by being related to the policy framework of the European Commission in respect of open access to and preservation of research data; it collected data from across the European Union and beyond and provided good practice recommendations for both the European Union and third countries. Additionally, stakeholders within the open access and data dissemination and preservation ecosystem gained a better understanding of the barriers, good practices and policy needs associated with open access to scientific data.



A major and unexpected impact that should be reported is that **the University of Berkeley integrated some of the RECODE principles into the teaching area of the archaeology discipline**.

The impact of this practice can also be described under these terms: strategic impact, impact on competitiveness, economic impact and social impact.

- <u>Strategic impact</u>: It provided recommendations to harmonize open access and data dissemination and preservation policies across the EU, and internationally had strategic impacts for the European Union in that European experts will be able to make better use of one another's research data, and evaluate the value of such data. Furthermore, creating a policy framework to support open access data repositories to co-operate across the European Union will prevent knowledge silos.
- Impact on competitiveness: The creation of scientific and open access networks of libraries, publishers and repositories as well as their integration with European and national funding bodies will enable the European Commission to optimize resources in the sciences. Streamlining policies to protect intellectual property and the personal data of research subjects will also prevent duplication of research, additional costs, loss of trust, etc. The elimination of these costs and duplications will increase European competitiveness overall.
- <u>Economic impact:</u> The RECODE project had an economic impact in that access to scientific data and research results and expert analyses will ensure that research efforts are not repeated. Funding bodies will encourage the re-analysis of existing scientific data and building upon existing scientific information. Increasing awareness surrounding open access repositories will also prevent wasteful duplication of publicly funded research.
- <u>Social impact:</u> The policy guidelines assisted in promoting more publicly accessible research by encouraging more transparency in research activities and outputs.

Finally, it should be mentioned that more concrete evidence towards the actual adoption of the guidelines are not available, since there was not an opportunity for a post-analysis of the project's measures.

4.9 RESPONSIBLE INDUSTRY | Responsible Research and Innovation in Business and Industry in the Domain of ICT for Health, Demographic Change and Wellbeing

Project summary: The project designs an Exemplar Implementation Plan of RRI in Industry to suggest how industry can work with societal actors and integrate RRI principles and methodologies into research and innovation processes. To achieve maximum impact, the implementation plan focuses on health, demographic change and wellbeing. Also, the project focuses on the role that research and innovation in ICT can play in addressing these challenges. Among others, there are interactive discussions between industry partners and stakeholders, an extensive literature review and pilot projects.

Number of practices: 4

P1: Synthesis of current discourses on RRI in the industrial context (based on a literature review, stakeholder interviews, case studies and Horizon scanning reports)

A1: Within the context of the RESPONSIBLE-INDUSTRY project (led by De Montfort University) and during WP1, the first practice undertaken was the **systematic synthesis and review of industry relevant RRI discourses**, both academic and policy-oriented. This report includes **a number of recommendations** regarding underrepresented areas that need to be included in the discourse, and areas that need to be further developed if the aim is to foster RRI in Industry. This practice is focused **on a specific application area; Industry** and even more specifically on **RRI discourse in health, demographic change and wellbeing /** "ICT for an ageing society". However, it did not focus on a specific RRI key; it rather examined RRI holistically.

A2: The objective of this practice van be summarised as follows:

- It aimed to clarify the ways in which RRI can be relevant to industry, and to map this to activities in industry that incorporate the principles of RRI.
- It was also a necessary practice in order to bring together different actors from industry, civil society and research and **implement RRI in a particular product**.
- The realisation of this practice and the accomplishment of the corresponding objective would then lead to the accomplishment of the project's final (and ultimate) objective, in other words the development of the RESPONSIBLE INDUSTRY
 Framework a Framework for RRI in Industry (that demonstrates how industry can work productively together with societal actors and integrate principles and methodologies of RRI into research and innovation processes).

A3: Various procedures took place for synthesising the RRI discourses in the industrial context:

1. A **review of the existing literature on RRI**, along with conversations with experienced RRI scholars, as well as analysis of the relation between public policy, Industry, and the project's application domain (**ICT for health, well-being and ageing**). In total **18**


domains were identified as being in need of further work and empirical investigation in order to become more applicable to Industry.

2. This review was accompanied by set of 30 interviews with thought leaders in the field of industrial R&I in ICT for health and ageing. The protocol for the interview study, and associated documentation required for ethical compliance, was completed and submitted for approval by DMU (De Montfort University) Ethics Committee on 23-04-14. Following approval by DMU and partner institutions, potential interviewees were approached, and interviews begun in June 2014. By December 2014 all 30 interviews had been conducted with interviewees located in 11 different countries: Spain, Italy, United Kingdom, Finland, Holland, Cyprus, Denmark, France, Sweden, Germany, and Switzerland. All interviewees were currently holding, or had previously held, key positions in at least one large, medium or small, ICT company; they were all working with projects that, in some way, related to the use of ICT for health and well-being.

Analysis of the transcripts was undertaken centrally, led by one of consortium partners to ensure consistency. A stepped process of **thematic coding**, with the aid of NVivo qualitative data analysis software, was utilised. Using an inductive approach, the first stage of open coding was followed by two further stages of thematic coding during which emerging themes were compared and contrasted and gradually refined. The final stage of the analysis consisted of identification of potential theoretical models for facilitation of RRI that could be fed directly into development of an implementation plan.

- In order to be able to provide companies real-life insights into RRI practice, five case studies were selected through an open call process. Case studies had to be original, based on real experiences, connected to ICT and Health and transferable to other fields. 12 submissions from 8 countries (including the US and South Africa) were obtained.
- 4. Finally, a horizon scanning exercise (separated in two stages) was conducted and 2 Horizon Scanning reports were created. The purpose of the horizon scanning activity was to ensure that the project is aware of other activities that can influence its success (in other words, that the conceptual underpinnings of the project remain 'untouched').

A4: No specific synergies have been reported to have taken place with respect to the above innovation practice. However, it should be highlighted that especially **for conducting the interviews, a cooperation with the interviewees (i.e. external stakeholders) was necessary**.

With respect to the **interrelation between RRI and ICT** (which was a core part of the above practice), **a correlation and similarity with other EU projects has been reported**. More specifically, the EU projects that can be considered as an observatory for RRI in ICT are:

- <u>Governance of Responsible Innovation (GREAT)</u>
- <u>RESPONSIBILITY</u>
- <u>Res-Agora</u>
- ProGReSS
- RRI ICT Forum
- ETICA (Ethical Issues of Emerging ICT Applications)
- <u>SATORI (Stakeholders Acting Together on the Ethical assessment of Research and Innovation)</u>
- Framework for Responsible Innovation in ICT (UK project)



• CONSIDER (Civil Society Organisations in Research Governance)

Finally, the activities mentioned within P1 share a **similar field of action with the Centre for Computing and Social Responsibility** (De Montfort University) and **the Virtual Institute for Responsible Innovation** (Centre for Nanotechnology in Society at Arizona State University).

A5: No information available.

A6: All these data collected and synthesized in relevance to RRI discourse in Industry:

- Clarified concepts and set the foundations for the next stages of the RESPONSIBLE INDUSTRY project.
- The conclusions reached proved to be a valuable source of information outside the context of the project as well. Most of the discussion of RRI has been focusing on publicly funded research and research that is undertaken in public institutions such as universities. Therefore, the conclusions drawn within P1 shed light into how RRI can be incorporated into a new domain (Industry) and bring together different actors from industry, civil society and research.

For instance, there were conclusions drawn from the literature review and referring to 18 domains/issues (some of them unexpected) that are in need of further work and empirical investigation in order to become more applicable to Industry:

- Democratization and Inclusion
- Lessons from the field of Corporate Social Responsibility
- Certifications and standards
- Codes of Conduct
- The importance of Distinguishing Sectors
- Operationalization of public good and well-being
- Underrepresented academic disciplines and frameworks
- Underrepresented Societal Needs
- Workplace environment
- Ethics Education
- Support Infrastructure
- Market Demographics
- New forms of Research and Innovation
- New forms of consumer power and online tools
- Public relations, branding and consumer power
- Workplace Equality
- Science communication and Open Access
- Politics and Power

The **interviews** then indicated the following aspects:

• Even for the most individuals that had worked in EC funded projects, the term RRI prior to the interviews was a new expression at that time



• One of the emerging themes from the interviews that had been adopted as a key message (both for the implementation plan and in general terms), was that by conducting their activities in a responsible manner, industries may both be doing good for society and benefiting themselves.

Finally, the horizon scanning exercise resulted in an identification of the primary "signals" - issues that were at that time being discussed in academia, and established new discourse around the area of ICT for health and ageing:

- the definition of ageing and the elderly
- concerns about future ageing technologies
- assumptions and stereotypes about older people
- ageing in a wider social context
- operational issues (such as barriers, enablers)
- design of technology for ageing
- future technologies for ageing societies

"Weak signals", or more current discussions extending the primary signals, were identified as well:

- future technologies
- innovation motivation
- future companies
- future environment
- future elderly

Therefore, the horizon scanning activity highlighted the broader societal context in which ICT for health and ageing is being implemented into, and it also highlighted the need to identify how other stakeholders, beyond the companies themselves, can contribute to a responsible way of developing novel healthcare ICTs.

P2: International Delphi Study of RRI in industry (along with an international multi-stakeholder workshop)

A1: The following practice referred to a **Delphi study**, which was conducted during WP2 and **coordinated/monitored by the Italian Association for Industrial Research (AIRI).** This method is based on structured group surveys in order to gather opinions and achieve a high degree of convergence on selected themes of exploratory, predictive and even normative nature.

The Delphi study conducted within the RESPONSIBLE INDUSTRY project included a tworound structured communication process, among a panel of geographically dispersed experts.

A2: The aim of this study was to provide basic information and **assess the attitudes**, **expectations and opinions** of a large number of relevant stakeholders from different countries in relation to **four different topics**:

1. Awareness about the concept of Responsible Research and Innovation (RRI)



- 2. How to integrate Responsible Research and Innovation into the Product Value Chain
- 3. Choice/selection of tools for Responsible Governance
- 4. Inclusion of RRI dimensions in the domain of ICT for an ageing society

Besides assessing these attitudes, the objective of this practice was also interrelated with **requiring the necessary input for drawing up in the next stages of the project the Implementation Plan** (which aimed to provide strategic options and recommendations for senior managers and others engaged in research and innovation in industries that are active in the field of ICT for an ageing society, to pursue responsible practices and behaviour in developing their devices, products and services).

A3: Experts from industry, academia and a significant number of key policy makers and endusers (consumer associations, care-providers, medical professionals, NGOs etc.) participated in the Delphi study, which consisted of **two rounds**.

During the first round, a small *monitor team* designed a questionnaire which was sent to a large *respondent group*. A list of about 480 stakeholders from about 380 different organizations was prepared, and the respondents to the first round of the Delphi were 165 (a number that surpassed the target). This relatively high return quota for surveys of this kind was achieved by various means, including personal contacts, telephone pre-contacts, emails sent together with the questionnaire and personal follow-up right up to the submission of the completed questionnaire. The 1st Questionnaire was prepared using the inputs of WP1 activities and comments from all the partners. The results of an interview with a representative of an ICT industry carried out for a first testing (straw test) of a draft of the questionnaire were also taken into account. Finally, this first round aimed to assess the view/position of experts representing different categories of stakeholders on the main issues at the base of RRI and its implementation.

During the second round and after the questionnaire was returned, the *monitor team* analysed the results and, based upon this analysis, developed a second questionnaire for the *respondent group*. This second questionnaire was made available to the 165 stakeholders who participated in the first round, along with the results from the first round. The respondents were 64 (a number once again surpassing the target). The second questionnaire, based on the feedback from the first-round, intended to give the experts an opportunity to compare their personal impressions with the range of opinions expressed by the other participants and elaborate further on key themes to reach a convergence on critical issues for inclusion of the RRI discourses in ICT industry for an ageing society. Deliverable 2.2 includes the final versions of both questionnaires, as well as more information on the respondents and their answers.

After the completion of the two rounds of the Delphi study, an **international multi**stakeholder workshop was held in Karlsruhe on May 20-21, 2015 at which members of representative stakeholder organizations had the opportunity to give further input to the consultation process. The expert workshop was intended mainly as a forum for dialogue on the most important issues that had arisen from the two-round Delphi Exercise and needed further discussion and in depth analysis.

A4: As already mentioned in A3, a straw test was employed for the development of the Delphi questionnaire. For this reason, there was an external collaboration with a researcher working for a large company in the telecommunication field and engaged in the development of telemedicine and tele-care ICT systems (so as to find out by interviewing him which tools are adopted by his company for risk analysis and to get his opinion on possible



incentives/drivers/barriers for inclusion of RRI discourses in industry). Finally, it should be underlined there have been personal contacts and cooperation with the parties taking part in the study and responding to the questionnaires (i.e. experts from ICT industry and academia, policy makers, consumer associations, care-providers, medical professionals, NGOs).

A5: No information available.

A6: The impact of the Delphi study highly can be summarized in the following:

- It contributed to the realization of the following steps within the RESPONSIBLE-INDUSTRY project (impact inside the ecosystem).
- The analysis of the Delphi Study showed that the complexity and variability in industry is too great to reasonably expect that a one size fits all plan can be applied to all industry actors, and indicated –through the questions answered- the most important and critical issues for inclusion of RRI in the ICT for an ageing society.
- The findings above complemented the results of the review of RRI discourse in Industry (P1), and then the combination of the results of these two distinct practices led to the design of the first draft of the Implementation Plan-Framework for implementing RRI ("Plan for Responsible Research and Innovation in ICT for an ageing society"). This first draft of the framework was used to evaluate and validate the insights and recommendations that the project had identified.

More specifically, **the first draft of the Plan** provided strategic options, recommendations, and procedures for RRI aiming **to promote the following activities**:

- Reflecting on ethical and social impacts and implications of R&I activities
- Aligning R&I processes along the entire value chain with users and social needs
- Promoting an inclusive approach engaging stakeholders in the R&I process
- Taking into account in R&I processes different aspects of the relationship between science and innovation with society: gender equality, transparency in information & communication (e.g. open access), ethics and education in ethics

P3: Pilot case-studies related to the domain of information and communication technologies (ICT) for health, demographic change and wellbeing

A1: After the first Implementation plan had been developed, it was evaluated by a series of actions e.g. International (Delphi Exercise) Multi-Stakeholders Workshop (May 21st 2015), discussion and feedback from partners.

The revision focused on the length and style of the text as well as on the improvement of its editorial presentation and graphics. This work led to the second draft of the Implementation Plan and to the publication of two reports:

- 1. A Framework for implementing Responsible Research and Innovation in ICT for an ageing society
- 2. Executive Brief: Implementing Responsible Research and Innovation in ICT for an ageing society



The second Implementation Plan was combined with conducting comparative pilot case studies. In more details, following the design of the first draft of the implementation plan, a set of comparative pilot projects was undertaken to ascertain whether and to what degree the plan was workable in companies. By following a pilot case study in Denmark, two in-depth case studies were undertaken each in Spain and Finland. This practice started in M11 of the project (WP2), and the pilot projects took place in two main stages including 'case study design' and 'data collection and data analysis'. All cases referred to the domain of information and communication technologies (ICT) for health, demographic change and wellbeing. The meaning of "case" in this context is that each company is offering its product or project for more detailed observations in the form of interviews and workshops.

A2: The purpose of these pilot projects was:

- To apply in practice and 'evaluate' the preliminary design/draft of the RESPONSIBLE INDUSTRY Implementation Plan.
- To examine how the plan developed previously could work along the different activities of the value chain, to test its applicability and how it could possibly influence research and innovation within an industrial environment; to assess the relevance, quality and usefulness of the 2nd draft of the Implementation plan as a result of WP2 (a testing activity for the Framework).

A3: It should be firstly underlined that the projects that are involved as cases may vary somehow from each other as was defined in selection criteria (i.e. large multinational companies vs. small companies). Therefore, one of the first steps in the case studies was to develop and modify procedures in order to select and justify candidate cases. The first stage was to do a pre-test, developing and testing the method and approach. For this purpose, a SME in Denmark was identified and analysed. Based on these results, four enterprises in two different countries (Spain and Finland) were selected for the cases. The selection criteria referred to a set of operational criteria at a company level, at project level and at product level (more information on the selection criteria is available at Deliverable 2.6).

The four case studies that were after all selected are described below:

- 1. The **first** actual case company was **a Spanish SME** that had been leading and had participated in Active and Assisted Living (AAL) –program projects. The company had a B2B business strategy, was privately owned, with positive 3 years of pre-tax earnings, and involved in assistive technologies. The CEO of the company was contacted and was then 'committed' to participate in the case study.
- 2. The **second Spanish case was a MNC (multination corporation)**. The company was privately owned, had a B2B business strategy, was active in terms of sustainability, and had positive 3 years pre-tax earnings.
- 3. The **third** company was a **Finnish healthcare service company** at a stage of intense growth. The company had developed a unique solution for those with dementia, the elderly and persons receiving home care who needed long-term medical treatment.
- 4. The **fourth case was a MNC and conglomerate** which had subsidiaries in various areas and offices all over the world. For the RRI case study, the company offered a project about wireless monitoring developed mainly in their Finnish office. In both of these Finnish cases ageing covered both the end-users (aging population as the end-users of the technology ageing at home or in hospital) and on the other hand ageing personnel who were working in the context (home care or hospital).

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All the participants for the study (employees from the selected companies) were interviewed by means of semi-structured interviews. Two rounds of interviews were designed by SDU (University of Southern Denmark) in order to engage company employees from various positions in the company: CEO/high level strategy manager, CTO/high level tech manager, the marketing or sales or CSR manager, the Research and Development (R&D) manager, and a member of R&D staff.

The first round of interviews with the comparative pilot projects was finalised in the Autumn 2016. After the analysis of the first round of interviews next steps for the intervention with companies were planned in more detail and customised according to analysis. After the interventions (workshops and planned customised actions related to them) the 2nd round of interviews was finalised with the companies in the beginning of 2017, in order to validate the interaction process with them.

The interview guidelines for the case studies were also framed by SDU. In addition, SDU integrated usage scenarios into the interview guidelines that described expected ways of using the RRI implementation plan:

- Company vision in relation to the RRI aspects
- Alignment of a company's research and innovation (R&I) with societal challenges,
- users and social needs
- R&I-based products taking into account ethical and societal issues
- Company structures and processes integrating RRI aspects
- Stakeholder/user engagement in the R&I process
- Adoption of preventive measures (e.g. technical solutions)
- Ongoing assessment and management of impact
- Open access to information and data on R&I processes
- Information and communication with stakeholders
- Training and multi-disciplinarity of professionals
- Cooperation, networking with stakeholders
- Long term impact analysis
- Gender related issues or concerns explicitly observed

After the design of the interview guidelines **different stages were identified for the interviews**, and they are presented here in three overarching categories:

- Issues pertaining to RRI awareness
- Assessment of the company's RRI level (RRI assessment)
- Implementation of RRI practice and integration of RRI principles in daily work

More information on the execution of the interviews can be found in <u>Deliverable 2.6</u>.

A4: As already reported in A3, during P3 of the RESPONSIBLE-INDUSTRY project there was **a collaboration with four different companies** for conducting the comparative pilot case studies – two companies in Spain and two in Finland.

A5: No information available.

A6: Conducting these pilot case studies provided, first of all, **useful insights for the opportunities and challenges related to research and innovation**. The conclusions reached referred to three categories of the interviews:

1. RRI awareness

- Issue awareness
- Acknowledgment of social connection & feedbacks

2. RRI implementation

- Collective action with external stakeholders
- Engaging in third party networks
- Employee engagement
- Aligning RRI with operational practices and procedures
- Anticipatory design
- Transparency

3. RRI assessment

- Risk identification and risk management
- Impact assessment
- Technology assessment

Some of these aspects had been already taken into account extremely well in participating companies (especially legal issues), some aspects could be improved via selected actions if seen as beneficial (user engagement, RRI culture and vision) and some aspects might feel either irrelevant or not very suitable being considered for the company (e.g. CSR-corporate social responsibility as a formal approach to SME).

Finally, the completion of P3 resulted in the completion of the first steam of evaluation and validation of the 2nd draft of the implementation plan, and led to the second stream and the consequent development of the final RESPONSIBLE-INDUSTRY Framework.

P4: Testing-Industry evaluation (and development of the final framework)

A1: The final step in the Implementation Work Package was **testing and industry evaluation**, **in relation to the draft versions of the Framework of an Implementation Plan for RRI in companies** (i.e. the application of RRI to ICT for health, demographic change and wellbeing).

A2: This practice was promoted **so as to:**

- Receive feedback from relevant stakeholders in different countries.
- Proceed to revisions and improvements of the Framework and its dissemination activities, with the ultimate aim of constructing the final RESPONSIBLE-INDUSTRY Framework.

A3: Various procedures took place so as ensure the necessary feedback. First of all, the concept of the Implementation Plan and the draft versions were **discussed in 15 Focus Groups with relevant stakeholders** – such as researchers, innovators, designers, and managers from several types of companies and moreover policy makers, civil society organisations and elderly people. The Focus Groups took place in the United Kingdom (DMU and EN in different groups), Germany (KIT and UClanCY in different groups), Cyprus (UClanCY), The Netherlands (UT), Italy



(AIRI), Denmark (SDU), and Finland (VTT). They started in October 2015 and ended in January 2017.

Concurrently, several versions of the draft Implementation Plan were published on the project website for comments and self-assessment from the Internet community. The publications of the draft documents and its final versions were announced on social media like Twitter (@resindustry).

Finally, comments and insights from a point of view outside the European Union were provided as well. A workshop took place in May 2016, where stakeholders from the U.S.A., China and Japan participated.

A4: No information available.

A5: No information available.

A6: Through this practice, valuable feedback was gained, leading to relevant improvements of the Framework and its dissemination strategies. In addition, this feedback was not one-sided and came from various sources; 15 focus groups (stakeholders), international experts and Internet users.

Upon the completion of P4, and after combining all the above innovation practices, the final Implementation plan, materialized in three documents, emerged. Each of these documents/models addresses a key barrier in the implementation of RRI:

- 1. **RRI Maturity model, using data from the case studies**: answers the insight that industry put in place actions that are vaguely relevant to RRI, without understanding how they align with the concept and without having visibility of the aspects of RRI they are neglecting. It allows to think of the RRI activities conducted in a company in a multifaceted perspective (theoretical value).
- 2. Causal loop model: is directed at companies who do not do RRI and are not convinced that doing RRI makes sense from a business perspective. It presents, in the form of a causal loop, the internal incentives and relationships between them, linked to adopting RRI (theoretical value).
- 3. Implementation model: provides information as to how RRI can be implemented, going beyond the current practices of industry, which focuses on ethics and education, but proposing a split of responsibilities and actions along the value chain, considering RRI as a whole (operational value).

The Responsible-Industry innovation practices and its Framework project have generated important impact outside the ecosystem of the participating organisations, since useful knowledge on how industry can work productively together with societal actors and integrate principles and methodologies of RRI into research and innovation processes has been produced. The focus of research and its application is the role that research and innovation in Information and Communication Technologies (ICT) can play in addressing the grand challenge of health, demographic change and wellbeing. The Framework is primarily directed at CEOs, senior executives and project managers of industry.

The gained foreground has been provided and promoted in other projects on RRI, e.g. *GREAT*, *NERRI*, *PIER*, *ProGReSS*, *Res-AgorA*, *RESPONSIBILITY*, *RRI-ICT Forum*, *RRI Tools*, *SATORI*, and *Synenergene*.

The Responsible Industry Implementation plan and the three corresponding documents also fed into successor projects. For instance, the RRI Maturity Model fed into ORBIT project,



which created self-assessment tool that will help organisations identify their strengths and weaknesses.

4.10 PE2020 - Public Engagement Innovations for Horizon 2020

Project summary: PE2020 identifies, analyses and refines innovative public engagement (PE) tools and instruments for dynamic governance in the field of Science in Society (SiS). For instance, the project creates an updated inventory of current and prospective European PE innovations and develops an accessible net-based PE design toolkit that helps identify, evaluate and successfully transfer innovative PE practices among European countries. In order to ensure practical relevance, the project works through intensive co-operation between researchers and science policy actors.

Number of practices: 3

P1: An updated inventory and a catalogue of current and prospective European PE innovations

A1: The PE2020 project (led by the University of Helsinki) set **two ambitious goals**, one being in the area of academic research, another in the area of PE practice and development of better governance practices. The first aim was related to the first innovation practice applied within the project. PE2020 aimed to identify and analyse innovative PE tools and instruments contributing to the dynamic governance in the field of Science in Society, by creating an updated inventory and a catalogue of current and prospective European PE innovations. This practice was applied during WP1 (led my Aarhus University).

The up-to-date inventory includes 250 prospective European public engagement innovations that encompasses 76 mechanisms and 250 initiatives, while the catalogue includes 38 innovative cases.

It applies a simple, **dual classification scheme** distinguishing between PE mechanisms and PE initiatives:

- PE mechanisms: generic ways of enacting public engagement
- **PE initiatives**: <u>concrete examples</u> of specific engagement activities

A2: The objective of this practice was:

- to construct a systematically ordered inventory of public engagement innovations in Europe and beyond
- to crystallize an analytical approach that is able to capture variation in PE objectives and formats, as well as their particular degrees of orientation towards the societal challenges identified in Horizon 2020.

More specifically:

• The inventory aimed to illustrate the scope and heterogeneity of both national and cross-national PE activities organised in Europe and further afield in a growing universe of PE initiatives worldwide.



• The catalogue aimed to explore some of the included practices in depth and across different engagement categories and objectives to explore the breath of PE formats and their different relations to the Horizon 2020 societal challenges.

A3:

> The construction of the inventory

It relied on a multilevel approach that was applied in the data collection process: desk research of research literature, surveys of innovative PE mechanisms and initiatives globally, and feedback from the partners and the international members of the advisory panel of PE2020. The main sources of data for compiling the inventory are described in more detail below:

- The empirical starting point for compiling the inventory was 37 national country reports of the previous European project MASIS (Monitoring Policy and Research Activities on Science in Society in Europe 2010-2012).
- A more up-to-date input was reached through a co-operation with the simultaneously organised Engaging Society in Horizon2020 project (Engage2020, 2013-2015). The Engage2020 project, a sister project to PE2020, conducted a survey related to PE activities related to research and innovation. The PE2020 inventory adds in these survey results where supplementary mechanisms and specific initiatives were located.
- The third data source consists of 50 SiS case studies conducted by the Technopolis group (1st version, May 2012) as a part of the mid-term SiS programme evaluation. Relevant examples of PE mechanisms/initiatives among these 50 case studies, which include cross-national PE activities have been reviewed and added to the PE2020 inventory.
- Other relevant current or completed EU SiS projects were also reviewed, although less systematically, and incorporated into the PE database.
- A literature review was conducted comprising both academic journals as well as 'empirical' reports addressing PE activities. The academic journals *Public Understanding of Science, Science Communication,* Science Technology and Human Values, and *Science and Public Policy* were examined for recent articles concerning 'public engagement', since these journals represent primary outlets for academic analysis of PE activities. This systematic procedure included recent articles published from 2008 onwards.
- External sources such as internet sources (e.g. homepages of institutions, organisations, centres etc. engaged with public engagement activities) supplemented data collection.
- Additional cases suggested by project partners and international advisory board members were also added to the inventory.

Moving further, the PE2020 inventory was presented under five headlines, which form a typology of PE mechanisms or initiatives:



- 1. Public Communication: the aim is to inform and/or educate citizens through one-way communication from sponsors to public representatives (e.g. public hearings)
- 2. Public Activism: the aim is to inform decision-makers and create awareness in order to influence decision-making processes through one-way communication from citizens to sponsors but not on the initiative of the sponsors (e.g. protests and demonstrations)
- 3. Public Consultation: the aim is to inform decision-makers of public opinions on certain topics through one-way communication from citizens to sponsors (e.g. citizens' panels and focus groups)
- **4. Public Deliberation:** the aim is to facilitate group deliberation on policy issues of where the outcome may impact decision-making through two-way communication and a certain degree of dialogue (e.g. consensus conferences and citizen juries)
- 5. Public Participation: the aim is to assign partly or full decision-making-power to citizens on policy issues through two-way communication and a certain degree of dialogue (e.g. direct democracy mechanisms such as participatory budgeting and youth councils)

> The construction of the catalogue

The catalogue of public engagement innovations included a number of PE innovative cases, in other words a number of initiatives for in-depth exploration in terms of innovative characteristics, orientation towards societal challenges, advantages and obstacles. The selection of the case studies relied on a nomination procedure, that included the full consortium and the international advisory board (10 nominators in total). Each nominator was invited to select and rank 10 innovative initiatives each using a specific tailored template. Nominations took into account six sets of criteria of innovativeness delineated below:

- 1. Hybrid combinations
- 2. Methodological novelty
- 3. Inclusive new ways of participation
- 4. Potential impact
- 5. Bearing on societal challenges
- 6. Feasibility

Nominators were requested to qualify each nominated initiative **by providing a reflection on the initiative on the backdrop of the selection criteria**. If supplementary criteria were used for nomination, each nominator was kindly asked to state these as well.

On the basis of the nomination process, a total of 62 nominations was obtained. Subsequently, case coordinators were identified as informants of the survey. Based on a common contact-protocol, each consortium partner personally contacted a number of case coordinators with information on the project and the objectives of the survey, and 56 questionnaires were dispatched. Each coordinator completed an open-ended survey exploring key features of the initiatives (mentioned above in the six criteria). The common survey structure allowed for horizontal comparisons of PE innovations, while the open and qualitative approach simultaneously enabled a more inductive examination of the concept and the features of innovative practices. Each case was classified according to the following main categories:

- **PE category**: Public communication, Public activism, Public consultation, Public deliberation, Public participation.
- **Mechanism**: Generic ways of enacting public engagement, e.g. consensus conference, participatory budgeting etc.
- **Main purpose of initiative:** e.g. awareness raising, education and capacity building, protest, dialogue/deliberation, knowledge co-production etc.
- **Geographical scale:** Global, European, National, Regional, Local/urban, and institutional.
- **Organizing entity:** e.g. National/local governmental body, academic institution, NGO, science museum, industry etc.
- **Target groups:** Lay publics, researchers, stakeholder organisations/groups, experts, public officials
- **H2020 Societal Grand Challenges:** e.g. Health, demographic change and wellbeing; Smart, green and integrated transport; Europe in a changing world - inclusive, innovative and reflective societies etc.

Finally, it should be stated that **the initiatives included in the catalogue come from a wide field of action**: from small-scale experiments to large-scale innovations, from local settings to transnational co-operations, from grass-root activities to national institutionalised mechanisms, and from awareness raising activities to direct power sharing exercises, among others.

A4: The first innovation practice applied within PE2020 had **an interrelation with previous EU projects, or with 'sister' EU projects** conducted concurrently at that time. More specifically:

- The act of compiling the inventory and the catalogue was based upon the results/final reports (on PE activities in various countries) of the MASIS project (2010-2012).
- PE2020 took this analysis a step further and complemented the analysis of MASIS.

In order to boost its capacity, the PE2020 practice **built on the outcomes of previous projects that had previously explored the dimensions of public and stakeholder engagement in Science, Technology and Innovation (STI)**: e.g. STEPE, SET-DEV, TECHNO-LIFE, VALUE ISOBARS, EU DEEPEN, PACITA, SYNTH-ETHICS, NANO-CODE, CIVISTI and FUTURAGE.

Finally, a cooperation was built with the 'sister' project Engage2020, conducted between 2013-2015 (also mentioned in A3);

- The Engage2020 project conducted a survey among international scholars in the field of research and innovation in order to map the use of methods for societal engagement in activities related to research and innovation
- The PE2020 inventory adds in these survey results where supplementary mechanisms and specific initiatives were located.

A5: **PE mechanisms were classified in five categories** (a kind of typology), which proved to useful in acknowledging different supportive and functional roles of PE processes in contributing to R&I activities. However, there were a few emerging problems, since **these five categories were found to 'leak' in two ways**:



- 1. Per definition, public communication and public consultation are 'one-way' approaches, while at the same time most of the innovative PE processes were found to be essentially 'two-way' processes.
- 2. Many individual cases were difficult to allocate under one category only. These led to the *conclusion that in future mapping of PE processes, there clearly is room for further conceptual elaboration.*

A6: This practice had a significant impact both inside the ecosystem of the participating parties and outside the ecosystem -on a broader and more innovative level.

To begin with, the data collected within the practice served as a foundation for further conceptual analysis in terms of dynamic governance of the PE (WP2) as well as the pilot selection (WP3) and the toolkit construction (WP4). Therefore, this practice contributed to the realisation of other innovation practices within the project and especially in the creation of the PE tooklit (P3).

In broader terms (impact outside the ecosystem), by identifying and analysing innovative PE tools there was a substantive impact including:

- New knowledge on PE and its use as an instrument of governing R&I activities
- The use of PE as an instrument that better supports science-in-society activity and societal engagement related to techno-scientific issues.
- A deeper understanding of innovative and context-wise PE practices that subsequently aid the diffusion of PE practices across the European nations (cross-country transfer and localisation of European PE practices)

Finally, this diffusion of PE practices and this knew knowledge has been transmitted to specific institutions as well. **The scholarship of PE has expanded to involve new partners** (besides the project partners), both in terms of new researchers and integration of different research traditions and frameworks.

P2: Context-tailoring and piloting of best practice PE processes

A1: Seven PE pilots (or 'pilot initiatives') were designed and implemented during WP3 (between February and November 2015). The term 'pilot initiative' was used to refer to the actual public engagement initiatives that were conducted in WP3. They were organised in the context of on-going research programmes in Finland and Italy, and represented different types of cases, with a mix of bottom-up and top-down led cases, as well as others with upstream and down-stream dimensions. They were collectively linked to the seven 'Societal Challenges' of the European Commission.

A2: At the time of the project, various novel PE tools and processes in the context of research programs closely linked to the Horizon 2020 challenges had been developed. Consequently, the aim of these pilot initiatives was:

- To evaluate the feasibility and test these tools in actual public engagement activities in other countries and for other societal challenges.
- To then identify potentially transferable practices.





This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824565

A3: The seven pilot initiatives were **co-designed and implemented with the target research projects and programs by funding agencies** (they were externally funded and as such had to adhere to the quality criteria set by the funding bodies, in addition to scientific criteria and institutional requirements). To ensure that there was an EU-wide dimension and relevance, **three of the pilot initiatives had been conducted in the context of EU joint research programmes, European innovation partnerships** or other types of R&I activities with a transnational dimension.

The pilot initiatives were carried out according to the WP3 guidelines, taking into account several contextual requirements. More specifically, the **aspects taken into account for the initiation of the practices were**:

- that the international research programmes and prioritisation of research were acknowledged as interesting contexts for pilot initiatives
- the **limited time devoted to the pilot initiatives** (and the difficulties in trying to align the schedules of PE2020 project and the partners)
- the limited resources available for the pilot projects

The criteria for selecting the pilot cases were the following:

- hybrid combinations of participatory tools to enhance discussions between researchers (science) and the public (society)
- **methodologically novel dialogue-based engagement,** participant empowerment and governance contribution
- **inclusive new ways of representation** in terms of methods of selecting actors and new combinations of actors
- potential impact on change, participants' influence and impact on public debate
- their bearing on the seven societal challenges identified in Horizon 2020
- **feasibility** regarding **effective transfer to other contexts** and pilot initiatives tested within limited resources
- the possibility of **gaining comparative insights** from examining at least two different country contexts (e.g. marine research programmes in the Baltic and Mediterranean contexts)

In the next phase, context tailoring workshops were organised. The purpose of the context tailoring was to consider the factors that precondition successful design and implementation of PE tools and instruments in <u>local</u> contexts.

The pilot initiatives were formed in a way that **would activate all the participants**. They were designed to bring forward positive attitudes about continuing their work to bring research closer to societal actors.

The seven pilot initiatives as well as the corresponding methods of analysis are depicted in the table below (more information about each pilot case separately can be found in <u>Deliverable 3.3</u>).

Name of pilot initiative	Country	Hosting programme	PE method tested	Context and method of analysis	Timing of engagement
Promoting science- society dialogue with blogs among early- career researchers on Baltic Sea research	Finland	BONUS programme	Social media platform	The online platform, analysis of the blogs	Mid-stream
Living lab of Global Change	Finland	Future Earth Finland – National Committee for Global Change Research	Living Lab	Townhall; network analysis	Upstream
Joint Programming Initiative (JPI) More Years, Better Lives (MYBL)	Finland	More Years, Better Lives Joint Programme Initiative	Deliberative engagement	The Societal Advisory Board; qualitative content analysis	Mid-stream
Societal Interaction of Science in Strategic Research Council funded projects	Finland	Academy of Finland	Societal Interaction plans	Systematic content analysis	Mid-stream
Empowering young researchers on PE in energy efficiency	Italy	ENEA Summer School on Energy Efficiency (ESS)	Expert meeting, stakeholder dialogue	Summer school; hermeneutic approach	Midstream
Dialogue Workshop on mobility and transportation	Italy	IDIS-Città della Scienza's "Futuro Remoto" Science Communica-tion Initiative	Dialogue workshop	Discussion outline; hermeneutic approach	Upstream
Educating science- society relations and public engagement	Italy	Agorà Scienza's Scientific Summer School	Consultation and public deliberation workshops	The scientific summer Academy; hermeneutic approach	Downstream

 Table 16. The pilot initiatives conducted within P2 of PE2020 project



A4: Within the context of the pilot projects, there had been a collaboration with various science policy actors in Finland and in Italy, in terms of preparatory discussions for preparing the ground for co-designing the pilot initiatives.

In the finish context, these science policy actors were:

- the Finnish Funding Agency for Technology and Innovation (TEKES)
- the Academy of Finland
- the Research and Innovation Council
- the Ministry of Economic Affairs and Employment
- the Prime Minister's Office

In the Italian context, the science policy actors were:

- the Agorà Scienza (in Turin)
- an Interuniversity Centre specialising in science communication and public engagement
- ENEA (Italian National Agency for New Technologies, Energy and Sustainable Economic Development)

A5: No information available.

A6: First of all, the pilot initiatives reflected a great impact within the ecosystem of the participating organisations in the practice;

- They created the space to actually practice public engagement and engage with stakeholders.
- They created opportunities for the cross-breeding of ideas and the exchange of different types of knowledge, and have allowed space for scientific, practitioner and 'field' expertise to flourish.

Transformational changes also took place in the institutions of the project's partners and collaborators. For instance, *Future Earth Finland* which was one of the project's pilot collaborator, adopted the Living lab and Town hall meeting concepts from the research materials that were presented and discussed with them.

Then, the pilot initiatives improved the quality, awareness and effectiveness of the activities tested in the pilot initiatives. They also resulted in a broader knowledge transfer, and provided valuable insights for identifying transferable practices in relation to Public Engagement.

The transferable best practices of PE that were identified were:

- 1. Identifying a basic cultural platform
- 2. Embedding PE initiatives in a broader change perspective
- 3. Incorporating the private sector in public engagement
- 4. Taking professional and disciplinary resistance seriously
- 5. Reducing the use of participants'/partners' time
- 6. The importance of motivation and investing in a positive attitude should never be underestimated

Recommendations also emerged out of the pilot initiatives:

- 1. Strong policies for public and societal engagement of science are needed
- 2. Public and societal engagement should be mainstreamed by making it a mandatory part of relevant funding programmes
- 3. National funding agencies and Horizon2020 funding programs should include resources for public engagement
- 4. PE should be treated as an irremovable part of academic working environments
- 5. Development of skills necessary for PE should be made a core part of doctoral training, comparable to methodological skills
- 6. PE activities should be included in the academic merit system as a form of incentive

Overall, the organisation of the pilot initiatives was seen as **'product development'**; **knowledge gained from the research in PE2020 practices reinforces ongoing PE practices**.

P3: Development of an accessible net-based PE design toolkit for science policy actors (PE2020 tooklit)

A1: Within the context of WP4 of PE2020 project, **the PE2020 tooklit** was designed; **an easily accessible web-based toolkit supporting the design of Public Engagement practice**s, created for the help of research managers, science policy actors and other interested users. The **Laboratory of Citizenship Sciences** (Rome, Italy) was the main organisation responsible for the tooklit. The tooklit was finally delivered online on January 20th 2017 (available at https://toolkit.pe2020.eu/)

A2: The main rationale for developing the PE2020 tooklit was to:

- Identify, analyse and refine innovative public engagement (PE) tools and instruments for dynamic governance in the field of Science in Society (SiS).
- **Disseminate all the above information** (both theoretical and practical) to a large audience in an as effective and accessible way as possible.
- Create a tool that has **both the character of a handbook (guidelines for the action)** and the character of a **toolkit (organized resources for the action)**.

Then, the **long-term objective** can be described as follows:

- Supporting the diffusion of PE within the European Research Area
- Mobilising the interest on PE of the key actors concerned with science and technology (e.g. research managers, researchers, policy-makers, stakeholders, NGOs etc.) and to favour innovation process in this field.

A3: The design of the tooklit was **developed by the consortium and in particular the leader of** WP4 - The Laboratory of Citizenship Sciences, but it should be mentioned that **the technical** realisation of the webtool was done by a sub-contractor (Danish Board of Technology Foundation, DBT). Moreover, the first version of the Toolkit was presented at the Hands-on session of the final policy conference, titled "Public Engagement for Research, Practice and Page 127 of 193



Policy. Exploring Policy Options for Responsible Research, Sustainability and Innovation" held in Brussels on November 16-17 2016. All the comments gathered were processed, leading to the final version of the web-based Toolkit. The process of designing the toolkit included **three** major steps:

- 1. An **analysis of the existing Toolkits**. Around 30 existing toolkits were identified and 18 of them were analysed in-depth (more information on the tooklits and handbooks that were analysed can be found in <u>Deliverable 4.1</u>).
- 2. An analysis of the outputs of the Catalogue of PE initiatives, developed under WP1
- 3. on July 2014, from the perspective of the development of the Toolkit. The 38 cases were been examined through interviews with representatives of the coordinating organization (the cases that were examined are available at <u>Deliverable 4.1</u>).
- 4. An analysis of the results coming from the implementation of seven PE pilot initiatives carried out under WP3 between February and November 2015.

In these three steps a variety of sources were employed. Some of these sources were considered internal (such as the catalogue of 38 case descriptions or the guidelines for context tailoring workshops), while others were seen as external sources (such as international literature, EC strategic documents on RRI, Deliverables of previous EC funded projects).

The tooklit finally included an introduction and four sections:

- **Introduction:** institutional background, aims, for whom the toolkit is for, how the toolkit is organised, how to use it.
- Section A: Strategic Framework (guidelines and resources for interpreting PE in various contexts and for appropriately placing PE in the European policy framework).
- Section B: PE methods and tools (categorisation of PE approaches and mechanisms, planning and implementation PE initiatives, as well as recognition of recurrent obstacles and resistances).
- Section C: Institutional anchorage (examples of PE strategies, programmes and tools devised by research organisations for permanently embedding PE in the practices of research institutions).
- Section D: Societal anchorage (strategies and tools that research institutions may develop in order to promote the consolidation of a scientific citizenship –PE along with science).

The **target audience of the tooklit** included **firstly research institutions**, which were seen as complex organisations with various internal players to be considered;

- **Top management** (e.g. rectors, vice rectors, members of the University Board or the Academic Senate)
- **Key offices**. (e.g. Communication Department, Human Resources Department or University Liaison Office)
- **Department Heads** (especially to heads of STEM Departments, who are considered to be less familiar with PE processes)
- Researchers



Secondly, the target audience included:

- **Policy makers** at national and European level (especially those involved with research policies
- Experts in public engagement and/or science communication
- Science centres and science museums
- Civil Society Organisations

A4: Since the time available for developing the PE2020 Toolkit wass limited, an effort was made to favour a **large consultation process** on the Toolkit's contents and structure with other institutions and experts working in the field of science-society relationships.

In addition, for developing the tooklit and proceeding to its realisations, there was a suggestion by EC to cooperate with the Danish Board of Technology (DBT) Foundation, since DBT was the coordinator of Engage2020 project. It was suggested that the main tool of Engage2020 – the Action Catalogue- could be 'combined' with the PE tooklit in various ways (e.g. developing the PE2020 Toolkit on the same platform of the Action Catalogue and having a unified website, referring to the Action Catalogue in developing the Section C of the Toolkit that refers to PE methods and tools etc.).

A5: No information available.

A6: The main 'product' that emerged out of this practice was the **Tooklit Website**. The tooklit and the corresponding website had a **considerable**, **broad impact** that exceeded the ecosystem of the organisations participating in the practice;

- It reached a large audience of individuals involved in the field of SiS (Science in Society).
- It provided a set of guidelines on how to develop PE within one's own institution.
- It provided a set of resources on how to do it in the best way as possible.

It should also be highlighted that for the development of the tooklit there was a critical examination of the state of PE in S&T (Science and Technology). Therefore, **significant problems and obstacles to PE were recognized** and useful conclusions were drawn, that could later on favour the development of PE initiatives and mechanisms. **Some of these are briefly mentioned below:**

- Science is a social institution linked to modernity; and like any other institution connected with modernity (such as trade unions) it is suffering a crisis in its relations with society. Concurrently, science is now technically stronger (i.e. it is more capable to influence our lives) and socially weaker than it was in the past. PE may therefore play a pivotal role in strengthening science institutions and creating new bridges between them and societal actors.
- There is a significant commitment from EC in promoting PE in science and technology, and this commitment led to the inclusion of Public Engagement as one of the five keys of the Responsible Research and Innovation (RRI) strategy launched by EC in the context of Horizon2020. Therefore, EC evidently sees PE



as a means for transforming research institutions, making them more aligned with the societal needs and expectations.

- However, PE seems to be still too weak to play the transformative role that EU is assigning to it. There are cultural obstacles, there is a limited engagement on behalf of research institutions and political leaderships in PE initiatives in terms of funds and resources, or there is a lack of institutional anchorage in PE initiatives.
- The dominant approach underlying toolkits and handbooks on S&T reflects the state of PE evolution. For instance, the **event-based approach adopted by the toolkits mirrors the lack of** continuity in PE, or the **technical/professional orientation** of PE initiatives and their **detachment from policy context** reflects the lack of integration of PE practices in the institutional processes.



4.11 MARIE – Mainstream Responsible Innovation in European SE

Project summary: In MARIE, partners from 8 regions face the challenges of RRI implementation together in the context of their smart specialization (S3) priority sectors. Their objective is to improve regional public policy that supports delivery of RRI to enterprises' product, process and service design, production and distribution.

Number of practices: 1

P1: Action plans based on Quadruple Helix, Open Innovation, Information & Tools for RRI application in S3

A1: In MARIE project (coordinated by CISE - Centre for Innovation and Economic Development, Italy) **partners from 8 regions** attempted to create **new R&I processes** that reflect the societal needs and ambitions, as well as **to address RRI**. However, they faced challenges in applying the RRI framework in the context of their smart specialization sectors. Therefore, **by using interregional activities, communication and stakeholder engagement they developed various Action Plans according to the Smart Specialization Strategy (S3) of each region**. The regions developing the Action Plans and the responsible partners in each region were:

- 1. **Forlì-Cesena** (Emilia Romagna, Italy) and Centre for Innovation and Economic Development (CISE)
- 2. Romania and Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI)
- 3. Attica (Greece) and Athens University of Economics and Business Research Centre (AUEB-RC)
- 4. Galicia (Spain) and Galician Innovation Agency (GAIN)
- 5. Tampere (Finland) and Council of Tampere Region and Tampere University
- 6. Southern-Eastern Ireland and Southern Regional Assembly
- 7. Centre Val del Loire (northern France) and DEV'UP centre Val del Loire
- 8. **Schleswig-Holstein** (Germany) and Ministry of Economic Affairs, Transport, Employment, Technology and Tourism Schleswig-Holstein

A2: The objective underlying these Action Plans was to improve the regional public policy that supports delivery of RRI to enterprises' product, process and service design, production and distribution; in other words, integrate RRI into regional S3.

However, S3 and development policies in each region are differentiated in correspondence to the primary development sectors (despite some generally accepted 'mega-trends)'; this consequently leads to a differentiated delivery of RRI to the regional services and to **differentiated objectives in each Action Plan in correspondence to the regional S3**. The table below (Table 17) depicts these objectives.



Regional Action Plan	Objective according to S3
Forli-Cesena (Emilia Romagna, Italy)	The Multiannual Programme (MP), which is a strategic and financial framework for Forlì-Cesena Chamber Commerce (CC), should have a sharper focus on key RIS3 sectors in Forlì-Cesena: food, wellness industries and technology. Therefore, the objective is that these S3 sectors shall a benefit from an integrated RRI approach, linking innovation and societal and environmental challenges.
Romania	The National Strategy for Research, Development and Innovation is based on 3 pillars: regional and global affirmation: enterprises as key innovation actors; excellence through internationalisation; regional leadership in strategic science and technology: breakthroughs. This strategy is coherent with the objective of smart, sustainable and inclusive growth, while S3 supports actions address environmental and climate change. Therefore, the objective is to insert a coordinated RRI approach as a pole for growth in the S3 priority areas.
Attica (Greece)	Within the context of ROP 2014-2020 and Priority Axis 1: Strengthening Research and Innovation mechanisms and investments for SMEs in the region, the policy objective is to enhance networking and communication support for improving social innovation delivery by social enterprises (the focus is on social enterprises). The Action Plan aims to introduce a structured RRI approach for social enterprises and insert a quadruple helix cooperation structure and form information and tools that help raise awareness on and capacity in RRI.
Galicia (Spain)	Within the context of OP ERDF Galicia 2014-2020 and Axis 1: Enhancing Research, Technological Development and Innovation there was a support towards public and private R+D infrastructures, R+D processes in firms and RTOs, creation of R+D networks, i.e. a focus on infrastructure. Now, the general aim and the objective of the region's Action Plan is to involve key stakeholders -who participate in S3 elaboration- in knowledge-driven processes for changing regional production.
Tampere (Finland)	Within the context of Sustainable Growth and Jobs 2014-2020, programme for investment for growth and jobs 2014-2020 in Finland, including the Tampere region Priority Axis 1: Strengthening Research, technological development and innovation, the focus in on accelerating multidisciplinary and inclusive development of new product and services. Concurrently, the regional S3 emphasises cross sectoral collaboration to open up new business opportunities (key thematic areas for cross-sectoral collaboration include smart mobility, future health and industry renewal). The objective of the Action Plan is to relate the RRI concept to the above S3 policy and potentially improve the areas of social inclusion and global and cross- regional collaboration.

Southern-Eastern Ireland	The Southern & Eastern Regional Operational Programme 2014-20 included a specific Priority (Priority 1) on Strengthening research, technological development & innovation. The priority axis focuses on research taking place in the Region with company engagement in applied research, as well as on regional commercialisation of research by Higher Educational Institutions (HEI). The objective of the Action Plan is to insert the concept of RRI as a horizontal principle in the above areas of focus.
Centre Val del Loire (northern France)	 Within the context of ERDF OP of the region Val del Loire – Axe 1 Knowledge Society and, more specifically, Axis 6 that addresses a) SME competitiveness b) the capacities of the region in research and c) technological development and innovation, there is an interrelation to S3 and the Regional Economic Development Strategy (SRDEI). The objective of the Action Plan is to introduce RRI in the above area in the sense of: a) focusing on end users oriented and stakeholder informed business models (circular economy, collaborative economy) b) considering gender and ethical aspects in research and innovation c) further focusing on open innovation
Schleswig-Holstein (Germany)	The ERDF Operational Program for Schleswig-Holstein 2014-2020 (Priority Axis 1: strengthening regional innovation potential) poses the relation to RIS3 as a prerequisite for innovation funding. Concurrently, the high level of innovation leads to obvious risks (environmental, social, ethical). Therefore, the objective of this regional Action Plan is to integrate RRI criteria and support tools in S3 policies (that have for instance a focus on maritime economy, life sciences, renewable energies, food industry, information technologies) for addressing the innovation risks and social challenges.

Table 17. The objectives of the regional Action Plans in MARIE

A3: All the Action Plans depend on the RRI Framework and on three consequent types of support action:

- Quadruple Helix model
- Open Innovation
- Information & Tools for RRI application

MARIE is an ongoing project and, therefore, limited information is available on the policies and procedures taking place in the regional Action Plans. However, **in the case of Tampere region, a policy improvement already taken place has been reported:**

> Policy improvement in the Tampere Region:



- Tampere Regional Council and Tampere University worked together, with support from the MARIE project, to introduce responsible criteria to their regional funding programme.
- An additional regional new RRI evaluation criteria was included in the call for projects related to responsible artificial intelligence (AI), and funded by 'Sustainable growth and jobs 2014 - 2020 - Finland's structural funds programme. The criterion focused on RRI and four of its elements: ethics, engagement, openness/transparency and safety/reliability.
- **RRI evaluation criteria was one of the 10 criteria sets** for evaluating project proposals and making the final decisions of funding. For this criteria, **applicants** had to describe how the four elements of RRI would be implemented in project plans and activities.

It should be mentioned that a similar initiative has taken place in the region of Southern Ireland, but there is less information available. RRI has also been implemented as a funding criterion for innovation. However, according to the promoters of MARIE practices, while in Tampere the emphasis was on the approach of this initiative, in Ireland the emphasis is placed on assessment e.g. awarding RRI-related projects has an impact on society, environment etc.?

With reference to the rest of the Action plans, **only a number of good practices** that have taken place in the 8 countries and/or participating regions and **can benefit or "inspire" the Action Plans** can be further analysed:

- Forlì-Cesena
- Perosci Eratici: This is an open innovation network of over 30 enterprises (mostly SMEs) jointly designing and developing sustainable solutions. Members get together through a process including input from experts of various disciplines, sharing of competences and technologies, brainstorming, feasibility check and business planning, business start-ups.
- UNI/PdR 27-2017: It provides a set of requirements businesses should implement to manage their innovation processes, according to the principles of responsible innovation, including among others stakeholder engagement, risk prevention and social and environmental sustainability.
- <u>Romania</u>
- Innovation café: A half-day event happening twice or three times a year, aiming to facilitate a collaborative framework among the actors supporting the innovation environment in Romania. There are discussions about innovative ideas and proposals that can benefit the innovation ecosystem, along with a focus on RRI principles and the quadruple helix cooperation.
- <u>Tampere</u>
- Demola Tampere: It offers an Open Innovation Platform concept that supports
 RRI by increasing public engagement for innovation processes and for improving



science education for the stakeholders involved. Teams are formed by students and company representatives.

- Koklaamo: It is a city development concept for finding new cooperative ways and efficient solutions to tackle everyday challenges of citizens' and the renewing urban environment. It consists of an open innovation platform that that brings together companies, communities, experts from different fields and citizens.
- Inno-Oppiva Co-development of educational technology through innovation platform: This good practice develops and pilots a concept, where tech companies, universities and educational institutions cooperate to support companies evidence-based agile product development. The objective is to create open innovation platform for supporting digital teaching and learning. It involves three actors: university, educational technology vendors and educational institutions in Tampere region.
- Tampere region Open Innovation Platforms: It refers to a cross-sectoral policy that supports inclusive access to open innovation activities. There is a data tool called the Situational Picture of Innovation. This framework compiles existing information from national and regional sources. The main objective of the process is to stimulate debate amongst local partners around the issues raised by the data. Stakeholders participating are: municipalities, research organisations, development agencies, companies, public administration organisations and HEIs.
- Southern-Eastern Ireland
- Development of the Impact Framework: Research impact should not concentrate only on scientific outputs. All SFI funded projects now focus on the broader impact on society and economy (this good practice actually inspired the policy improved in the Tampere region regarding the inclusion of RRI as a criterion in project proposals)
- Centre Val del Loire
- *Entrepreneurial discovery process (EDP):* stakeholders from different environments and actors from the Quadruple Helix interact and identify priorities related to S3 and PEI-AGRI (European Innovation Partnership for Agriculture)
- <u>Schleswig-Holstein</u>
- Innovation & Technology Forum Schleswig-Holstein: The regional government decided to set up an inter-ministerial working group of all the actors in ministries who have responsibilities in innovation processes, to establish a steering committee for technology transfer and innovation that includes stakeholders form scientific institutions, enterprises and environmental associations, trade unions and to organize an annual Innovation & Technology Forum event. The format is consistently adapted and modified according to the goal and topic of the event. Keynote speeches, impulse speeches, discussion platforms and workshops are the varying parts of the events.



A4: A considerable **correlation exists between MARIE's practices and the EU project ROSIE**. They share a similar rationale, but in **ROSIE there is an emphasis on the standpoint of entrepreneurs**;

- Are entrepreneurs aware of RRI?
- Are entrepreneurs doing anything in relation to UN Sustainable Development Goals, that cover almost all aspects of RRI?
- For instance, do entrepreneurs pose ethics issues in their processes?

A5: Certain considerable challenges have been reported by the promoters of MARIE:

- They had to turn RRI (a principle) into a more detailed requirement.
- There was a need to **keep working in a comprehensive RRI framework** that also takes into account different aspects at the same time (e.g. social sphere and environmental sustainability).
- A '**political' challenge**: maintain the social aspect in RRI initiatives despite the tendency/turn towards technological innovation (like in the region of Attica).

A6: Actual impact can be described in the case of Tampere region that included RRI in the evaluation criteria of project proposals and are currently in the phase of analyzing/evaluating their results. More specifically:

- Through the inclusion of RRI as an evaluation criterion, project calls will take under consideration ethics, engagement, openness/transparency and safety/reliability, and therefore new innovation practices promoting the socioeconomic benefits of responsibility will take place in the projects.
- The improved funding call opened in December 2018 and the evaluation tool is currently being used in the evaluation process of the received proposals.
- The evaluation of the results of this call in comparison to other calls that did not include RRI criteria will contribute to providing strategic recommendations for other calls in Tampere region.

The **potential impact** of the Action Plans that will attempt to integrate RRI in S3 policies refers to:

- Changes in projects funded by policy instruments and in policy management structures and strategic focus, including integration of RRI as a horizontal concept
- More and better targeted funding for RRI delivery
- Increased capacity among innovation actors
- Consolidated partnerships of quadruple helix innovation chain stakeholders

Finally, and when taking into account the perspective of the promoters of MARIE practices, at the time of designing the project's **true innovation and impact lied on taking RRI out of the academia and linking it with regional policies through an interrelation process** (Figure 1).

Deliverable 3.2



Figure 1. The interrelation between RRI and S3 in MARIE



4.12 BigPicnic: Big Questions - engaging the public with Responsible Research and Innovation on FoodSecurity

Project summary: This project builds, through the co-creation approach and public debate, public understanding of food security issues and enables people across Europe and in Africa to debate and articulate their views on Responsible Research and Innovation (RRI) in this field to their peers, scientists and policy makers. The final phase of the project consolidates the findings of the public engagement to produce two key publications (recommendations for RRI on food security and a co-creation RRI toolkit that will build capacity for engagement in further science institutions across the EU).

Number of practices: 3

P1: Big Picnic Basket: Development of outreach exhibitions

A1: Among the partners within the Big Picnic project (coordinated by Botanic Gardens Conservation International -BGCI), 15 of them -which are **Botanic Gardens- hosted low-cost, co-creation sessions on a food security topic by using the metaphor of a picnic basket and by promoting the RRI key of Public Engagement**. The exhibitions took place in WP3 of the project and mainly during the years 2017-2018, were coordinated by the Botanic Garden Meise (in Belgium) and included **information, activities and participatory events that engaged a broad range of target audiences** (adults, schoolchildren and families). From these sessions BigPicnic exhibitions content was developed.

It should be mentioned that there were also **links with regional policies**, since each garden set up a **Food Security Advisory Group – FSAG** (further analysed in A4) to help shape their topic, audiences and activities. This group represented key food individuals and organisations in the local area and was **specific to the key interests and relevant priorities of each area/country.**

A2: These outreach exhibitions aimed to:

- Increase engagement with local and global food security issues.
- Co-create with **diverse audiences** (that would normally not meet), accessible and novel mechanisms to facilitate interaction and **bridge the gap between the public, policy makers and researchers.**
- Develop **botanic gardens as centres that promote dialogue** between public, researchers and policy makers.

A3: **"Exhibition" was used as a flexible term** to incorporate a **wide range of activities and events**. In addition to typical stands and panels, there were also **workshops, hands on practical activities, videos, demonstrations and other activities**.

The **audiences** selected included 'hard-to-reach' individuals that the Partners would like to engage with on the subject of food security: refugees, migrants, schoolchildren, students, individuals living in lower socio-economic areas, senior citizens, families, urban gardeners,



middle class consumers, activist groups, policy makers, socially disadvantaged children and teenagers.

Co-creation was central to BigPicnic as a strategy for the botanic gardens involved, in order to engage with new and existing communities on the topic of food security. There **were four key elements in the co-creation and organisation of the exhibitions:**

- Relevance Co-creating with a variety of communities, including experts in food security and its context, as well as local people who are experts in how these matters affect them, ensures that the results reflect a range of viewpoints and therefore have relevance to people's lives.
- Ownership Co-creating with target audiences ensures people feel part of, and invested in the project, making them more likely to act in favour of food security initiatives.
- 3. **Agency** Co-creating with experts, target audiences and stakeholders ensures that they have a concrete view of their options. This empowers people to make their own choice about how things could be handled, and choose that which is most fitting to their circumstances.
- 4. Sustainable design options Experimenting with designs with all co-creators by reiterating and improving designs helps to achieve the best fit for a particular target audience and context.

Specific themes were selected by each Partner and integrated into the exhibition activities (in the wider context of the theme of food security). These themes were:

- Food waste
- Food demand gap
- Urban gardening
- Knowledge erosion of growing food
- Soil use
- Food vs Identity (eating habits)
- Cultural aspects of food
- Insects as a protein source
- Pollination
- Climate change
- Crop wild relatives (biodiversity)
- Wild edible plants
- Sustainability
- Healthy food
- Healthy diet
- Ecological footprint
- Access to nutritious food

In total, **103 activities** were developed and were **delivered in a variety of locations to ensure the project's reach was as wide as possible**. In the same line of argument, they were run both in the garden and at external sites. All the activities are available in <u>Deliverable 3.2</u>. In addition, the activities were conducted within the context of case studies (two case studies were conducted for each Partner). The description of the case studies along with information for the content of the activities are available at <u>Deliverable 3.1</u>.

Some these activities are depicted in Table 13:

Name of the Activity	Venue		
Soil – stand your ground	Botanical Garden Vienna / Plant Fair		
Edible insects here and there	Royal Museum for Central Africa, Tervueren		
Roots, tubers and bananas	Buurtcentum De Platoo, Koekelberg		
Film: Face behind the food	Night of the Museum, Warsaw Botanic Garden		
Plant & eter	11 botanical gardens and a tree nursery museum in the Netherlands; Amsterdam, Utrecht, Boskoop, Oudenbosch, Hilversum, Alkmaar, Aalsmeer etc.		

Table 18. Some of the activities taken place within the exhibitions of the BigPicNic project

A4: In the beginning of the project, and prior to implementing this practice, an FSAG – Food Security Advisory Group (experts related to food and food security) was established in each country. The role of the FSAGs was to provide information about food, production, food security, food research and food plants at both the local and global levels. Therefore they comprised professionals from agriculture and farming, industry, academia, NGOs, retail, grass-roots organisations, local authorities, governing bodies, etc.

Then, as already stated in A3, the project's Partners and mainly the Botanic Gardens were engaged and cooperated with a variety of external stakeholders during the exhibitions and the corresponding activities for ensuring public engagement with the theme of food security: refugees, migrants, schoolchildren, students, individuals living in lower socio-economic areas, senior citizens, families, urban gardeners, middle class consumers, activist groups, policy makers, socially disadvantaged children and teenagers.

In relation to correlations with other projects and as mentioned by the promoters of the BigPicnic practices, there was at times a similar timeframe and approach. For instnce, there was an overlaping with the <u>DITOs project</u> - both through sharing of progress and resources, but more particular by linking the two projects where there were partners or countries in common. For example, the DITOs bus which traveled across Europe delivering science education activities was hosted by the exhibitions in Bergamo Botanic Garden, one of the project partners.

The BigPicnic FSAGs and the relevant mentoring process and establishment of a Community of Practice were also inspired **by INQUIRE project**.

Finally, there was an interrelation with **already existing frameworks**, since some **key issues** that emerged from the data gathered by the botanic gardens were **aligned with the Sustainable Development Goals (SDGs)** set out by the United Nations, as well as **the key Food and Nutrition Security priorities (Food 2030)** identified by the European Union.

A5: Certain challenges emerged while applying the various activities of the outreach exhibitions:



- When employing a co-creation participatory approach to the activities, some partners found this challenging as it involves giving freedom and decision making to the group; so, the lack of control and the slower process was a challenge for some. However, all partners did successfully use the approach to engage with their audiences.
- For some partners there were challenges from within their organisations. For larger organisations (part of universities) there was support in terms of finances and number of people, but there were also additional checks and approval required and sometimes a disconnect between the project staff and the wider organisation. One partner used the co-creation approach within their own organisation successfully to address this problem.
- With smaller organisations there was sometimes limited capacity/support available to undertake all of the activities. Again partners were creative some used volunteers and interns to help with data collection, others contracted nearby gardens to complete some of this work, etc.

A6: By practicing the co-creation approach and organising the exhibitions, BigPicnic partners managed to **note important impacts at the organisational level of their own ecosystem** (impact inside the ecosystem). All partners ran co- creation events in their own organisations and:

- Engaged not only the public but in-house staff.
- Brought together **people from different professions and hierarchy levels** in their organisation.
- Valued these co-creation activities as very **rewarding** for not only designing, implementing and evaluating their activities, but also for **broadening their own individual and organizational horizon.**
- Especially from the point of view of the promoters of BigPicnic practices, all **Partner organisations embraced a new outlook on project delivery**; new in terms of looking for cooperation with unfamiliar stakeholders; and new in terms of approaching unfamiliar audiences. Thus, each had to leave their comfort zone and try out new and unpredictable activities.
- All Partners developed a nuanced understanding of RRI and an appreciation of the key elements of public engagement in RRI

At the same time, they accomplished to reach and influence the broader ecosystem, and surpassed the organizational level of the participating organisations (impact outside the ecosystem):

- They generated **awareness of food security**.
- They created **shared ownership on this subject**, identifying more sustainable practices.
- They influenced the behaviour of their visitors.
- Many of the BigPicnic exhibitions and corresponding activities developed though co-creation have been **displayed across Europe**, in places heavily frequented by botanic garden visitors or the local public such as regional festivals and food shows (visibility at the local and regional level).

Finally, as informed by the promoters of the BigPicnic practices, there was a great impact both at a community and a governmental level, through the unexpected cooperation of external actors:

- In Brussels, a community impact was delivered by one major group of local residents. The African Diaspora, who became a target group for Meise Botanic Garden, have now 'discovered' the botanic garden and gardens in general as a hub for knowledge on agrofood and collaboration for projects in their country of origin. As a result of this, the African Diaspora Agrofood Forum (a forum for entrepreneurs and scientists) is taking place for the second time at Meise Botanic Garden in September 2019 and is likely to become an annual event. This bringing together of cultural groups with scientific institutions showcases the key role that botanic gardens can play as hubs for social cohesion, the sharing of innovative ideas and the co-development of more sustainable urban communities.
- In Italy, there was a significant impact on the sensitivity of legal operators to food security issues. The meetings and other events organised by Bergamo botanic garden, in collaboration with lawyer's, raised lawyer's awareness of the agri-food sector as a possible new job market. Proof of this was the establishment of a special food law commission publishing periodic articles that are disseminated both to citizens and colleagues. The garden continues to work with lawyers to develop events related to food, law and economics.
- In Scotland (RBGE), the project saw a positive impact at the governmental level. The newly formed Committee Engagement Unit (CEU) at the Scottish Parliament visited RBGE to learn about their experience of BigPicnic. The Commission on Parliamentary Reform in Scotland published recommendations in 2017 which included the establishment of this dedicated unit (the CEU) whose purpose was to support (and challenge) committees to undertake more innovative and meaningful engagement. RBGE shared their BigPicnic approaches and successes in data collection and analysis as well as their use of digital storytelling developed through the co-creation approach. RBGE is now building on the connection to the CEU and will become part of the network that the Unit is setting up, ensuring continuity in the use of participatory approaches.

P2: Science cafés on the topic of food security

A1: Within the context of WP4 of Big Picnic project and from M15 to M32, science cafés were run in all Partner countries to engage the public with this dialogue. Across the partnership, 102 science cafés took place attracting a total number of 6052 participants and promoting the RRI key of Public Engagement.

In general terms, it should be noted that the science café approach is originally a grassroots movement, and aims at removing barriers between science and scientists and the public by creating a casual learning environment for both to learn from and with each other.

A2: Two distinct goals underlay the development of the Big Picnic science cafés:

1. To **reach a variety of different people**, researchers and members of a variety of target groups.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824565

2. To address and discuss a variety of issues related to food security -highlight the relevance of food security to the public life- and come up with policy recommendations accordingly.

A3: The science cafés focused on the **food security topics** that were discussed and **were agreed through Food Security Advisory Group (FSAG) meetings, suggested during co-creation sessions for the exhibition and collated from recommendations** at the outreach exhibitions.

Some of the **topics and sub-topics** that were selected to be addressed during the science cafés (all of them available in <u>Deliverable 4.1</u>) were:

• Food security

- Household food security
- Agro-ecology for increased production and food security enhancement in Uganda
- The link between bees as pollinators and food security
- Sustainability
- Sustainable food on the university campus
- Sustainable nutrition
- Sustainable food: What about waste?
- Healthy food
- Health and food: A difficult union?
- Healthy soil Healthy food?
- Food: Well-being and tradition?
- Alternative food
- Insects for food, feed and food security
- Wild apples and cultivated apples: Food resources vs. biodiversity of wild species
- Science beer: Alternative food supply chains, is it possible?
- Urban gardening and bee keeping
- Bees in the city Disappearance of bees and competition between wild bees and honey bees in the city
- Beekeeping in the city Mission possible
- The garden in the small town A basis for food independence
- Food in education
- Students' nutrition
- We network: From the school garden to the food security
- The role of school in food security
- Food habits
- Why most Ugandans prepare and serve themselves more food than they can finish eating?
- Let's talk about food, with food producers and consumers and with whom is watching and studying our behaviours
- Food is communication. Food cultures and nutrition for a world with a future
- Others
- Family labour and inclusiveness of every family member to increase food production
- Let's talk about bread! With bread makers, consumers and researchers
- Preserving, fermenting, smoking. Just a trend or more?

The science cafés aimed to and accomplished to reach the following **target groups**:



- People living in deprived areas
- African diaspora people
- Teenagers and adults (including families)
- Policy makers
- Students and teachers (formal education institutions)
- Educators (informal education institutions)
- Individuals from various professions: lawyers, farmers, cooks, social services employees, producers
- Researchers
- Visitors of the gardens
- Volunteers

Themes and topics summarised under the umbrella term 'food security' are mostly societal as well as scientific. Thus, a science café falls short if scientists are the only experts invited; most partners invited experts from more than one field and managed to create a dialogue amongst discipline.

The **experts that were after all invited to address a particular topic** and bridge the gap between research/science and public were:

- Scientists
- Researchers (biology, ecology etc.)
- University lecturers/professors (biology, ecology, etc.)
- Medical doctors
- Nutritionists
- Professionals in urban agriculture
- Experts related to Politics
- Local councils
- Politicians
- Decision makers/policy makers
- EU-staff
- Experts related to Nutrition
- Chefs
- Restaurant owners
- Experts related to Education
- Teachers
- Students
- Children
- Experts related to Agriculture/Garden
- Farmers
- Botanic garden staff
- Home gardeners
- Experts related to Religion
- Religious leaders
- Others
- Library staff
- Dancers
- Contemporary witnesses (Witness of a time period)

The science cafés also employed a variety of settings:



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824565
- Outdoor events
- Fish pond grounds
- Botanical gardens
- Castle
- Connection to nature/botanic garden
- Trading centre
- Orangery of the botanic garden
- Gardening centre
- Greenhouse
- Botanic cottage
- Public
- Conference centre/Conference hall
- Museum
- Community centre
- Stadium
- Food and drinks
- Restaurant
- Pub
- Local markets/Market hall
- Home, city/village
- Local library
- Home of someone
- Small village
- Digital
- Internet
- Excursions
- Field of lavender

During the science cafés, a common approach that was employed was **expert talks that stimulate discussion.** Besides these talks, BigPicnic Partners also used **a wide range of creative and innovative ideas** in order to invite participants to actively participate. Some of these activities offered during science cafés were:

- Activities related to food and drinks
- Food tasting
- Smoothies
- Picnic
- Cooking
- Lunch
- Breakfast
- Oral activities
- Panel discussion
- Group discussions
- Presentation
- Questions answers
- Decision making with cards
- Story puzzle
- Anonymous discussion



- World Café
- Interactive activities
- Teamwork (Elaboration of a topic)
- Debate
- Role play
- Game
- Quizzes
- Creative activities
- My plate
- Making a poster
- Workshops
- Building an insect hotel
- Beekeeping
- Origin of different fruits world map (for children)
- Difference of fruits and seeds smoothie (for children)
- Cultivating plants building a greenhouse (for children)
- Observing bees with binoculars
- Guided tours
- Botanical garden
- Multimedia activities
- Demonstration
- Digital story telling
- Short films/audios

Finally, an evaluation procedure was established in relation to the science cafés. In more details, the dialogues and deliberations amongst each science cafés audience were recorded. Partners collected and analysed data (according to the TBI approach -further explained in A4) and transferred them into the final reports intended for policy makers. Data collected were managed according to the ethical guidelines developed by the partnership and in accordance with data management legislation.

A4: For creating more effective and stimulating discussions, as well as in order to encourage the audience to actively participate, there was a cooperation with experts from various disciplines and external stakeholders; they were invited to talk during the science cafés. These experts and stakeholders have already been reported above in A3.

It should also be noted that for collecting the data necessary from the science cafés, the **TBI – Team Based Inquiry approach** was employed. It refers to a **cyclical process of inquiry:** *question, investigate, reflect* and *improve*.

The TBI approach has been developed by the Nanoscale Informal Science Education Network (NISE Net). It empowers education professionals to gather the information they need, improve their products and practices and, ultimately, engage more effectively with their audiences. It provides an active learning space to **carry out evaluation in collaboration with their audiences**.

It is worth mentioning that BigPicnic employed TBI for building upon the participatory approach used in the <u>EU project VOICES</u> (the importance of public engagement was also reinforced in both projects through this approach). Concurrently, <u>The PLACES</u> toolkit supported the BigPicnic Management Board to adapt TBI in order to evaluate project outcomes.



A5: No information available.

A6: The results of the evaluation procedure, which was developed with respect to science cafés, reflect in a robust way the impact of this innovation practice; **the goals that were set as part of the evaluation were achieved and brought up significant changed to the broader ecosystem**. More specifically:

- Science café reports provided evidence that the general public, hard to reach audiences and people interested in food security, were reached (Evaluation Goal 1).
- A variety of issues related to food security were addressed and discussed (Evaluation Goal 2):
 - Food security was addressed from the level of the private household up to the national and global food system.
 - How sustainable ways of eating can be achieved, how alternative ways of food production and consumption may contribute to that as well as topics around healthy food, urban gardening and bee keeping were tackled.
 - Changing food habits and emphasizing and improving food education as well as a wide range of other aspects were discussed all over Europe.
- Policy recommendations were formed (Evaluation Goal 2). They targeted both policy makers and informal learning sites and they are relevant to United Nations' Sustainable Development Goals (SDGs) and the European Union's Food 2030 Priorities Some of these recommendations (more details are available in the seven corresponding policy briefs) were:
 - 1. The cultural heritage dimension of food should be embedded in food policy
 - 2. Increase the resilience of citizens, especially vulnerable groups, to climate change and increase climate neutrality of food systems
 - 3. Future funding frameworks should address more efficient food loss and waste management, small scale food production and sustainable supply chains.
 - 4. Food and food security, should be topics embedded throughout the formal and informal learning systems.
 - 5. Use participatory approaches to raise unheard voices and broaden our perception of expertise.
 - 6. Organisations should embrace new approaches and draw on a broad spectrum of expertise as catalysts for change.
 - 7. Increase capacity in climate smart agricultural approaches to address challenges posed by climate change and the impact on livelihoods and nutrition in Uganda.
- The impact of the science cafés and the suggested measures towards food security exceeded the expected number of recipients: 6052 participants as opposed to 3000 envisaged in the proposal, and 102 science cafés as opposed to 90 envisaged in the proposal (Evaluation Goal 3).

Moreover, according to the perspective of the promoters of the BigPicnic practices, **science cafés had further positive outcomes** as well (not necessarily described under the project's Evaluation goals):



• Through the science cafés , partners trialed and tested new ways to run a science cafe and the resulting science cafe toolkit highlights the variety of options explored and the main findings - particularly that experts come in all forms they are not just scientists and can bring real value to a science cafe.

Finally, if one combines the impact of the exhibitions (P1) and science cafés (P2), the following should be highlighted:

- A **public dialogue regarding RRI and food security** was generated and pubic opinions toward these issues were collected.
- An international discussion was hosted, which provided useful insights on how people in different countries and social groups understand and interpret food security.
- The approaches used (co-creation, Team-based inquiry and RRI) allowed to show that botanic gardens are well placed to **act as important hubs within their communities**, a **"safe" space** where different actors can come together to discuss important or controversial topics.

P3: A co-creation navigator

A1: The **co-creation navigator guides individuals through the different stages of co-creation**, from preparation to execution, and directs them to tools and methods that help them in each stage. It is **the main outlet for open and transparent communication about Waag's co-creation methodology**, developed and continuously improved by Waag's Co-creation Lab. The <u>website</u> of the navigator has been developed and hosted by project Partner Waag. The resource will remain online and will be supported by Waag for future use in other projects.

A2: The **intention** of the toolkit has been to **help cascade the concept of co-creation in Open Access form** and provide the corresponding tools.

A3: According to the promoters of the BigPicnic practices, the **central process** for the development of the co-creation navigator was that **institutions learned how to facilitate cocreation and support co-creative processes**. Then, through the (co-creative) dialogues supported by exhibitions and participatory events, the **project Partners highlighted the potential of informal learning sites, like botanic gardens, to embrace multi-stakeholder collaboration**. Project Partners trained by WAAG to facilitate co-creation, have received a certificate and function as **ambassadors for the Navigator**.

The co-creation navigator addressed:

- **People who wish to work with a diverse group of citizens**, users and/or stakeholders to develop new products, experiences and/or services.
- First timers, who can learn about co-creation (methods and mindsets) .
- **People more experienced in co-creation**, who can explore new methods (and in the future, add and share their own preferred methods).

Finally, **the BigPicnic project involved nineteen Partner organisations**, including botanic gardens, universities, a science shop, an institute for art, science and technology, and an international NGO. These Partners used a range of travelling exhibitions, activities, science



cafés and participatory events, co-created with local people, to generate dialogue and build greater understanding of food security issues, and have **ultimately contributed to the development of the navigator.**

A4: The co-creation navigator has been developed and tested **in correlation with and with the support of the following H2020 projects**:

- <u>MUV Mobility Urban Values</u> is a research and innovation action that raises citizen awareness on the quality of the urban environment where they live in order to promote a shift towards more sustainable and healthy mobility choices. The MUV solution will be open, co-created with a strong learning community of users and stakeholders and piloted in six different European neighbourhoods.
- <u>Cities-4-People</u> is an H2020 project revolving around sustainable and peopleoriented transport as a solution to the many challenges linked to mobility and faced by urban and peri-urban areas today. The project aims to implement mobility solutions developed by the people for the people. It taps into participatory practices of social innovation and neighbourhood governance and builds on three main pillars: citizen participation, community empowerment and sustainable urban planning.

WAAG actively promotes the use (and will continue to extend the content and functionality) **of the Navigator in new (H2020) projects such as** <u>Mingei</u>, in which museum partners are trained to facilitate co-creation with local craft communities.

A5: No information available.

A6: The impact of the navigator lies in 'demonstrating' the benefits of co-creation and providing tools and methods that can help individuals host this process:

- Find a **connection between groups** that would normally not collaborate.
- Raise awareness and sensitivity towards important issues with certain groups.
- Create a safe space for sharing.
- Create a common understanding.
- Enable the creation of more layered and nuanced outcomes.
- Build relationships between groups that exist well beyond the scope of a project.

4.13 JERRI - Joining Efforts for Responsible Research and Innovation

Project summary: JERRI fosters RRI transition in Europe by developing and testing good RRI practices in pilot cases, for a further upscaling among the RTOs in the EU28. After identifying the state-of-the-art of good RRI practices in all five RRI keys, goals are developed for within each dimension and barriers are recognized. The project is also set up as a mutual learning process between the consortium, further European RTOs, stakeholders, and two international associated partners.

Number of practices: 3

P1: RRI Transformation Plans in Fraunhofer (including a long-term vision)

A1: In the JERRI project (coordinated by Fraunhofer-Gesellschaft), Europe's two largest Research and Technology organizations (RTOs) -**TNO** in the Netherlands and Fraunhofer-Gesellschaft in Germany- have joined forces to advance towards responsible research and innovation practices. After both organisations went through a first stage of RRI goal setting, they implemented RRI-related pilot activities and developed long-term transformation plans focusing on all RRI dimensions. The transformation plans were 'built' during WP4 of JERRI for Fraunhofer.

A2: The **rationale** underlying the development of the RRI transformation plans was to **promote the adoption of RRI practices** ('RRI-related' or 'key dimension-related' ambitions) regarding societal engagement, gender equality, open access, ethics, science education, as well as crosscutting issues such as RRI governance. Then, the long-term aim was **the adoption of these practices to lead to 'institutionalization'**, in the sense of a conscious and systematic attempt in organizational change towards the (further) internationalizing, embedding and professionalizing of RRI practices (embedding RRI into the DNA of the organization).

In the case of Fraunhofer, it has been reported that the aim was twofold:

- Developing long-term orientations for organizational development towards RRI.
- Defining operational goals for RRI pilot activities to be realized immediately within the duration of JERRI that are aligned with these long term ambitions.

A3: For implementing the RRI pilot practices and 'constructing' the transformation plan, specific 'steps'/policies were followed in Fraunhofer.

At first, **roadmapping workshops** were carried out **for each RRI dimension**. These workshops were **moderated by Fraunhofer ISI** and took place at different locations, i. e. in the city or at the place where the respective Fraunhofer partners responsible for the implementation of the pilot activities were located. Each workshop was carried out **as a one-day workshop and held in German.** The thematic focus of each workshop is depicted in the Table below:

Workshop	RRI key	Focus
Workshop in Munich	Ethics	Integrating ethical reflection into internal programming
Workshop in Stuttgart	Gender Equality	Gender in research content
Workshop in Stuttgart	Open Access	Open science in Fraunhofer
Workshop in Oberhausen	Societal Engagement - Science Education)	Societal engagement in Fraunhofer

Table 19. RRI workshops conducted in JERRI project

Workshop participants (internal and external participants) came from various backgrounds:

- **Change agents**, i. e. actors able to move something in the organization located in the central administration e.g. the Head of the Open Access department.
- Individuals from the institute level e.g. institute's library manager (OA), a researcher in an area with gender sensitive aspects (gender) and a colleague actually applying citizen engagement intoregular research projects (SE).
- **The Fraunhofer CeRRI, a Fraunhofer research team** created within the JERRI duration with a special focus on societal engagement but also on gender in research.
- External participants: managers of pioneering Open Access publishers, a person from the ministry keen on promoting citizen engagement in research, an individual from Austria who had first-hand experience from a pioneering support programme to gender sensitive applied research that would be of high relevance to Fraunhofer (Gender).

The transition roadmap (a normative roadmap that describes steps towards a future goal) was then framed, after building on the theoretical insights of the 'deep institutionalization' framework. Within this framework, three levels of organizational change were highlighted and taken into account:

- 1. **Inter-organizational & environment level:** The level of institutional logics within the organisation's environment and inter-organizational relations, for example nation state policies and its effect on organizations
- 2. Intra-organizational level: This level includes the organizational culture, its structure and the established processes and routines within the organization (the most crucial for organizational change)
- 3. Individual Actor level: This is the level of individual staff members within the organization. A particular focus in on institutional entrepreneurs and their



performance as change agents who are willing and in a position to make a difference in the organization. The 'normal' employee also needs to be enrolled into the change process.

Finally, the roadmapping workshops and the RRI transition roadmaps **resulted in different short-term pilot activities and to a long-term vision for each RRI key** (Table 20). The pilot activities were seen as the preliminary step; they had to be widened and institutionalized, so as to then lead to visions and long-term goals.

RRI key	Short-term pilot activities	Long-term vision
Ethics	 Ethical screening and consultancy for project proposals in the internal research programmes. Multiplying orientational knowledge on research ethics in the research management qualification programme 'Forschungsmanager/in'. Set-up and test of a discussion format on one particularly relevant application field. 	 Fraunhofer takes on a leading role: it is being consulted for ethical issues in Fraunhofer-dominated strategic fields as it actively deals with the respective ethical challenges Ethics contributes to the creation of identity at Fraunhofer in terms of Responsibility (e.g. Fraunhofer carries out research projects with a long-term perspective and takes on responsibility towards its customers and society as a whole) Enabling (e.g. Fraunhofer staff is enabled in terms of 'competence' to live up to 'ethics'.) Value pluralism (e.g. Fraunhofer actively deals with different moral concepts)
Gender	 'Gender Diversity Toolbox': further development, opening up and internationalization of the existing Gender Diversity Toolbox. 'Role models at Fraunhofer': the identification and public communication of role models by means of integration into the Gender Diversity Toolbox and by designing an electronic booklet. 'Gender in research content consciousness': identification and (further) development of existing checklists, identification and 	The aspect of gender sensitive research was not covered in much depth. Only one sentence stated that "Gender competences exist, also for gender in research content" .



	communication of related case examples by means of integration into the Gender Diversity Toolbox.	
Societal engagement	 Citizen's office: a series of citizens' meeting in which social needs can be put forth to science. Fraunhofer Debate: a public debate with actors from academia and civil society on a topic of high public attention. Stakeholder Avatar: an algorithm that will systematically browse the World Wide Web for relevant social interests. UMSICHT Dash Button: a software-based solution to enable sustained citizen engagement in environmentally relevant scientific topics on a continuous basis. 	 Fraunhofer covers all levels of participation: agenda setting, research process and projects, social debates. Specification: e.g. Fraunhofer is a permanent contact point for citizens, Fraunhofer provides resources and leeways for participation etc. Specifications for workshops: e.g. researchers are well versed in communicating their findings in an easy to understand manner, involvement of more societal actors such as NGOs, industry and citizens etc.
Open Access	 Setting up and testing the open data infrastructure FORDATIS. Development of an open access business model and IP clarification support. Development and test of "open paragraphs" in research contracts. Development and communication of a marketing strategy for Open Access at Fraunhofer, including the identification of role models (scientists), best practices and an Open Access road show. 	 Fraunhofer has undergone a fully-fledged cultural transformation towards Open Access and now lives up to its social responsibility Specification: e.g. all data and publications resulting from publicly funded scientific research are treated as commons and full access is provided to any person wishing to consult them, Fraunhofer researchers are present in Editorial Boards of Open Access Journals Specifications for workshops: e.g. existence of new dissemination formats (data + text), open access is the standard way of publishing etc.

Table 20. Short-term pilot activities and long-term vision for the embedding of RRI in Fraunhofer

A4: In terms of synergies and regarding **Fraunhofer Gesellschaft**, there has been a **cooperation** with various external stakeholders that attended the RRI workshops (reported in A3).

A5: In the process of institutionalizing RRI activities, various barriers had been detected in relation to all three levels of organizational change. However, it has been highlighted that depending on the circumstances, **these barriers can function as enablers as well**.

1. Interorganisational & environment level

- Encountering **legitimacy instability or crisis** as a challenge to the status quo within the organizational field.
- Finding appropriate forms and language to get in contact/communicate with the public.
- **Dealing simultaneously with incentives and expectations** from the environment, which have to be coordinated to avoid pressure.
- Working with the **profession's moral code and normative standards** underlying the training of young scientists.
- 2. Intraorganisational level
 - The need to **deal with multiple institutional logics.**
 - The **commitment of the leadership** and to which degree they are passionate about certain values and the mission of RRI.
 - Raising awareness and acceptance for RRI within the organization.
 - Dealing with **power struggles** among the organisation's individuals.
 - Developing the right organisational structure and culture with sufficient capabilities and capacities.
 - Finding proper financing and business models.

3. Individual actor level

- The **performance of institutional entrepreneurs/change agents**, especially in successfully overpowering incumbents and challenging the status quo of the organization.
- The alignment between the profession's moral code and attitude towards RRI.
- A different type of leadership also at the middle levels which engages and motivates by a constant communication and celebration of good practice and which abandons barriers for new types of collaboration.
- **Raising acceptance and willingness of researchers** towards RRI, e.g. to share their scientific results and to get in touch of with the public.

A6: Since JERRI is a recently completed project, it has not yet been reported whether structural or organizational changes have been achieved in the context of Fraunhofer.

However, what is worth highlighting is that the **Transformation Plans** that were developed **attempt to assure the long-term transformation** of the participating organization after the end of the project (long-term vision and goals). These plans were **revised/updated** towards the end of the project, **adding a new important actor or a new window of opportunity.**

P2: RRI Transformation Plan in TNO (including a long-term vision)

A1: Within the context of the JERRI project, Europe's two largest Research and Technology organizations (RTOs) -**TNO** in the Netherlands and Fraunhofer-Gesellschaft in Germany- have joined forces to advance towards responsible research and innovation practices. After both organisations went through a first stage of RRI goal setting, they implemented RRI-related pilot activities and **developed long-term transformation plans focusing on all RRI dimensions**. The transformation plans were 'built' during WP5 of JERRI for TNO.

A2: The **rationale** underlying the development of the RRI transformation plans was to **promote the adoption of RRI practices** ('RRI-related' or 'key dimension-related' ambitions) regarding societal engagement, gender equality, open access, ethics, science education, as well as crosscutting issues such as RRI governance. Then, the long-term aim was **the adoption of these practices to lead to 'institutionalization'**, in the sense of a conscious and systematic attempt in organizational change towards the (further) internationalizing, embedding and professionalizing of RRI practices (embedding RRI into the DNA of the organization).

In the case of TNO, it has been reported that the aim of 'institutionalisation' had an even more specific orientation among the 6 Grand Narratives (i.e. strategies for organizations to relate to RRI):

• Narrative F: Research and Innovation With/for Society, e.g. ambitions for the amelioration of pressing societal problems

A3: In order to develop the Transformation Plans at TNO, at first specific goals and actions for each RRI dimension were set. It was also foreseen which groups of individuals from within TNO (change agents/internal stakeholders) could contribute to the implementation of these actions (see Table 21).

RRI key	Goals and Actions	Change agents/internal stakeholders
Ethics	 Ethical Awareness Training/Game. 	 Human Resources (HR) HR Leadership Developmen manager Trainees manager
	 Societal and Ethical ImpactToolkit. 	 Marketing and Communications Units Project Management Guild
	 Scientific Integrity E- learning Module. 	 Integrity Commission Corporate Science Office
Gender Equality	 Female Leadership Training. 	 W@T (Women at TNO), Leadership Development (LD)
	 Database for Female Talent. 	 HR, LD, Unit directors/research managers



	 Implicit Bias Training (25 HR managers). 	HRLD
Science education	• To show science.	 CSR steering Committee Marketing & Communication units
	• To champion the value of science.	 Integrity Officer Science Director Marketing & Communications
	• To invite society.	 CSR steering committee External actors (STEM professionals, women, interest groups)
Open Access	 Set up platform and action plan. 	 Intellectual Property and Contracting (IP&C) Research Information Support (RIS) Business and Contract Support (BCS) Scientists
	• Decision Tree Publishing.	Research & Information Support

Table 21. RRI goals and actions in TNO for embedding RRI

So as to further institutionalize the above action and proceed to the creation of the longterm Transformation Plans in TNO, various workshops or types of consultations were organized.

Then, the long-term plan/vision for each RRI dimension was formed (Table 22).

RRI key	Long-term vision
Ethics	 Awareness of ethical and societal issues, learning and improving (culture). Systems and processes in place (risk management and compliance). Leadership in ethics and strong 'ethical' culture: Responsible Innovation.
Gender Equality	 Inclusive culture. Equal opportunities in recruitment, selection and promotion. Better organizational results.
Societal Engagement	 Awareness of societal role and impact in TNO, and also in clients and partners.



	 All TNO's program lines contribute explicitly to societal goals (e.g. SDGs.) Societal license to operate: 'Innovation for the Greater Good' (a CSR ambition). Link to Science Education (so that society can adopt innovations appropriately).
Science Education	 Social license to operate: Narrative RTO's for/and Society. Attractive, inclusive employers. Link to Societal Engagement.
Open Access	 Open Access linked to other elements of Open Science; open data, open methodology. Culture change: proactive entrepreneurial attitude towards Open access/Open science. Larger order intake and impact through increased visibility and interaction with parts of TNO

Table 22. The long-term vision for the Transformation Plans in TNO

A4: In terms of synergies and regarding the case of **TNO**, most actions were implemented with the aid of internal stakeholders. With reference to external stakeholders and external collaboration, it has only been reported that **in some actions societal/citizen engagement could prove useful** and that, in general terms, **the internal cooperations were preferred over the external ones in the case of TNO**.

A5: While attempting to institutionalize RRI in TNO, various **barriers and enablers were detected**. Prior to describing them, it should be underlined that **most emerging issues are related to** *trust* **or the lack of it**, while in academic terms, one can distinguish between high-trust organizations and low-trust in organizations. In the same line of argument, **TNO comprises elements of 'high trust'** (it consists of professional, who would perform best in a 'high trust' culture) **that create enablers for RRI**, as well as **elements of 'low trust'** (it is increasingly moving towards a 'low trust' culture, with formalities, legal compliances, governance structures such as risks board) **that evoke barriers for RRI**. These barriers (that are in our case examined as a variable) can be summarised as follows:

- Barriers (related to the low-trust culture)
 - **People's motivation**: resistance to change and no 'room' for RRI.
 - **Perception of time and availability of budgets**: people's agendas are full and they cannot work on RRI.
 - Awareness and urgency: lack of awareness
 - Leadership: command structure, targets are rewarded
 - **Clarity (about tasks, roles, responsibilities)**: 'artificial' clarity, with lots of complex processes

A6: A6: Since JERRI is a recently completed project, it has not yet been reported whether structural or organizational changes have been achieved in the context of TNO.



However, what should be highlighted is that the **Transformation Plans** that were developed attempt to assure **the long-term transformation** of the participating organization after the end of the project (long-term vision and goals). These plans were revised/updated towards the end of the project, **adding a new important actor or a new window of opportunity**.

P3: International mutual learning process

A1: Within the context of developing their organisational structures and practices towards RRI, Fraunhofer (FhG) in Germany and TNO in Netherlands developed an international mutual learning process with the Chinese Academy of Sciences (CAS) and Arizona State University (ASU). This international learning process carried out in-depth case studies of the two aforementioned outstanding organisations outside Europe, and evolved during WP9 (coordinated by Fraunhofer) of the project.

A2: The aim of this practice was:

- To analyse RRI-related practice in two international organisations and to learn from international experiences in order to gain inputs for sharing the RRI goals and RRI action plans of Fraunhofer and TNO
- To exchange expertise and experiences with the international partners in the whole project process, that could facilitate the realisation of mutual learning effects.

A3: The analysis of the RRI-related practices in the two organisations focused on the following:

- Learning from different meanings and facets of RRI
- Measures to institutionalise RRI
- The reasons to/not to implement RRI as well as obstacles and responses/reactions in implementing RRI within the organisation
- Identifying international "good practice" examples

At first, **two rounds of in-depth interviews were planned in both institutions**. The key reason for this approach was to achieve a broad empirical base in order to learn how responsible research was spread across the organisations. However, **in the second round interviews were conducted only with ASU**, since it turned out to be complicated to connect with more people in different research institutes at CAS in the second round. The report that functioned as a source of information for this practice focused on the second round/stage of mutual learning process i.e. **the case study in ASU**.

This case study is based on **35 in-depth interviews with all in all 39 researchers and faculties at ASU**. To enhance the quality of interview information, the interviews took place **face-to-face and on-site at ASU campus**. 14 of these interviews were conducted during the first round of interviews in autumn 2016, 21 further interviews during a second field visit in Phoenix, Arizona, in 2017.

Some of the **individuals that were approached** for the interviews were the following:

• **Two deans from larger schools**, who reported about the diversity of faculty motivations.

- One principal investigator (PI) from the engineering school, who gave a personal account of his way of living up to the overall mission and a diverse set of incentive schemes.
- Seven experts of RRI-type approaches, who belonged to the "Center for Nanotechnology in Society" (or the related School for the Future of Innovation in Society) a center funded by the National Science Foundation (NSF) within the National Nanotechnology Initiative for around 15 years.
- **Staff of the administration** with responsibilities for strategy, finance, diversity, open access and social embeddedness.
- Faculty members at different levels of seniority deans or directors of schools or research centers, professors, individuals preparing for getting tenure and graduate students (faculty members came from a large number of different ASU schools including leading interdisciplinary schools or centers such as the School for the Future of Innovation in Society, the School of Human Evolution and Social Change etc.).

The interviews were **recorded and notes were taken**. In line with the EU directive on data protection, the contents of the interviews were **analysed**, **aggregated and documented anonymously**. The interviews were also **analysed according to the further developed theoretical framework of** *Deep Institutionalisation*. (more information on the *Deep Institutionalisation* interview guidelines are available in <u>Deliverable 9.2</u>).

Document analysis and desk research were also employed. Three kinds of documents related to the international partner organisations were gathered and studied:

- 1. **Documents regarding RRI**, e. g. strategy/position/discussion papers, mission statements, speeches, etc.
- 2. Documents related to the five RRI key dimensions, which are not necessarily put in an RRI-context already, e. g. action plans, codes of conduct, platforms, portals, regulations, etc.
- 3. Information regarding RRI related events, e. g. workshops, forums, dialogues, seminars, etc.

A4: No information available.

A5: With respect to challenges and barriers, it has been reported that:

- It was particularly difficult to identify interview partners who had not (yet) practiced RRI and who were interested to reflect about potential barriers (and levers) for RRI in their working environment.
- As it was easier to observe what *there was* as compared to what *there was not* (yet), it was underlined that **the samples of interview partners had a bias** towards the faculties and staff who were engaged more actively in responsibility issues.

A6: The case study of Arizona State University (ASU) suggested some clear linkages between ASU's mission and some of the RRI keys appeared. In general terms:

• This task provided the project team with a first understanding of RRI/ rri practices at ASU and, therefore, some possible "good practice" examples were identified.



• This was a considerable impact regarding the internal ecosystem of Fraunhofer and TNO, since these examples could function as a basis or as an indication for further integrating RRI in the two organisations participating in the JERRI project.

Some more **general but valuable insights** that can apply to the ecosystem of several research organisations were also gained. For instance:

- It was indicated that the change process needs institutional entrepreneurship. Documentary research and the in-depth interviews showed that strong leadership with new visions for the organisation plays an important role in particular through consistent communication of the narrative that provides legitimacy for change. For instance, if institutional entrepreneurs in organisations aspire to achieve systemic consolidation, it was identified in the interviews that the means is a new way in hiring and staffing procedures.
- The case study and the interviews **revealed certain factors hindering a broader institutionalisation of RRI-related design aspirations.** Researchers and staff face obstacles due to systemic persistence, or various problems regarding new reward structures, evaluation standards and promotion procedures.



4.14 GENERA - Gender Equality Network in the European Research Area

Project summary: GENERA is a Horizon 2020 project aiming at continuing, monitoring and improving the Gender Equality Plans of Research Institutions and Organisations specifically in the physics research field. The project focuses on the implementation by European research organisation of Gender Equality Plans customised to circumstances of the physics research community. The customised Gender Equality Plans involve systematic examination of all decision-making processes to identify any possible sources of gender bias in the research organisations active in physics and related fields. While the end goal focuses on the research world, GENERA looks into the origin of the problem by creating liaisons with schools and proposing suitable programs to foster the field from early stages and to propose measures that can be adopted by middle and high schools.

Number of practices: 3

P1: GEPs for the field of physics (potential of application in other research fields)

A1: The EU project GENERA brought together **13 important research organisations and higher** education institutes with the scientific focus on physics in Europe to help foster gender equality through customized and evidence-based Gender Equality Plans – GEPs (defined as policy tools for furthering gender equality within an organisation). GEPs were implemented during WP4 of the project, and two institutions were the responsible beneficiaries for this implementation: Karlsruhe Institute of Technology - KIT (Germany) and University of Geneva-UNIGE (Switzerland). The partners that implemented the Gender Equality Plans and their corresponding country were the following:

- 1. National Research Council (CNR), Italy
- 2. National Center for Scientific Research (CNRS), France
- 3. Deutsches Elektronen-Synchrotron (DESY) A Research Centre of the Helmholtz Association, Germany
- 4. Instituto de Astrofísica de Canarias (IAC), Spain
- 5. Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering (IFIN-HH), Romania
- 6. National Institute for Nuclear Physics (INFN), Italy
- 7. Jagiellonian University in Krakow (JU), Poland
- 8. Karlsruhe Institute of Technology (KIT), Germany
- 9. Max Planck Society (MPG), Germany
- **10.** Institutes Organisation of the Netherlands Organisation for Scientific Research (NOW-I), Netherlands
- 11. University of Geneva (UNIGE), Switzerland



A2: These Gender Equality Plans aimed to (according to European Commission guidelines):

- conduct impact assessment/audits of procedures and practices to identify gender bias
- implement innovative strategies to correct any bias
- Set targets and monitor progress via indicators

In more specific terms, the GENERA GEPs also aimed to create more effective interventions through **close alignment with each organisation's objectives and context**, and focus on specific organisational needs, identified as part of the prior analysis of the status quo **(context-based institutionalisation of gender equality).**

A3: The design and the implementation of the GENERA GEPs entailed **six specific steps**, that **reflected models used in theories of organisational change and change processes**. These steps (dependent to each other) are presented in the table below (Table 23). A detailed description of the steps and actions performerd is available in <u>Deliverable 4.2</u>.

Step	Short description	Examples of key actions performed
LEARN	Understand the decision structures of the organisation and its rules, and identify the institutional framework within which decisions and actions will be taken.	 Check relevant national laws and policies promoting gender equality in each country. Get to know the attitude towards gender equality at all levels within ther organisation, talk to various units/departments and target groups and explain the role of the GENERA Project.
ANALYSE	Analyse the current state of affairs using a variety of gender indicators by collecting sex dis-aggregated quantitative data and qualitative data.	 Involve the HR department in data collection; sometimes they have already relevant data. Analyse sex-disaggregated data about staff at all levels by demographics, education qualification, career path, work organisation, etc. (and summarise the most important findings).
DESIGN	Design a customized GEP by identifying specific fields for action and the improvements needed, together with tailored measures that can achieve	 Write down your GEP in consultation with the Implementation Team and (if there is one) the office for gender equality, HR





	change and a realistic time frame specific for your organization.	 department, diversity management or other offices in your organisation included in the implementation process. Define a time period for the realization of the plan.
IMPLEMENT	Introduce your customized GEP to the organisation and engage relevant decision makers in promoting the implementation of the specified gender equality measures to demonstrate visibility of structural changes.	 Ensure that the needed resources (personnel and financial) are provided. Be aware that adaptions to the GEP may be needed.
MONITOR & ADJUST	Monitor progress and how the selected measures are applied in light of the experience and adjust the measures and objectives.	 Establish indicators to assess measures, adapt them to the purposes of the measures. Identify potential sources of resistance.
FINAL EVALUATION	Do a final evaluation and based on the results adjust the conditions specified in the GEP to move forward in the process of change towards the desired objectives.	 Analyse the progress of the GEP by evaluating the past and the objectives/measures reached so far. If some measures have not been reached, Distribute surveys to all employees in order to check their opinion on specific measure to identify potential sources of resistance.

Table 23. The six steps of the GEPs of the GENERA project

All these steps were supported by the Top-level of Management and Leadership and the Implementation Team:

- Management and leadership had to:
- Approve relevant documentation and activities for supporting the needed structural changes.
- Make available sufficient financial and personal resources to implement the customized GEP.
- Instruct the relevant units/departments to provide information and data for designing the GEP, and for the continuation of progress towards agreed gender equality objectives.
- Demonstrate commitment to gender equality principles and the GEP, and promote legitimacy of the agreed actions and measures.
- Enable integration of the GEP into research activities.
- Become involved in the practical implementation of gender equality measures.





- Use internal communication channels for greater visibility of the benefits of implementing the GEP.
- Promote awareness of gender equality issues and benefits.
- Make the organisation's gender equality objective and the role of the GEP visible to all employees.

Decision-makers from all levels of the organization should interact and cooperate for enhancing the success of the GEPs. Therefore, the Implementation Team should include an appropriate representative from the Human Resources department, as well as key managers. More specifically, **Members of the Implementation Team should**:

- Stay in regular communication (throughout the implementation process).
- Participate in the activities organised within the framework of the GEP.
- Integrate gender equality within the organisation and embed it within all relevant existing structures.
- Make the implementation process transparent and understandable to all employees and external stakeholders.

A4: A correlation with various projects has been highlighted, in terms of promoting Gender Equality. These projects are:

- Baltic Gender
- **EFFORTI**
- EQUAL-IST
- <u>GEDII</u>
- <u>Hypatia</u>
- <u>LIBRA</u>
- <u>PLOTINA</u>
- <u>SAGE</u>

A5: No information available.

A6: Regarding the organisations implementing the GEPs within the context of the project, it has not yet been reported whether specific structural changes took place.

However, if one moves further and beyond the ecosystem of the participating organisations and the impact within them, **GENERA GEPs functioned as a basis and a source of inspiration for the creation of gender equality plans**. In more details:

- The GENERA partners jointly developed "Physics best for all" protocol of predefined procedural method for improving gender equality in physics organizations (in the same vein as the protocols for conducting scientific experiments). This protocol, aimed at institute directors and senior HR, serves as an umbrella under which to develop local, customized GEPs and actions. This protocol has the following characteristics:
- Gender Equality Plan (GEP)-driven
- Systemic change using a transformative approach
- Data-driven, evidence based
- Addressing notions of excellence



-

- Promoting inclusion and belonging
- Based on the experience in designing and implementing the GEPs in eleven physics organizations and upon reflection on the implementation managers' (IMs), observers', evaluators' and experts' experience in the GEPS, **a set of recommendations was formed.** These recommendations (based on the identified gaps in GEPS) are particularly relevant for physics organizations.
- What is highly considerable and indicates a major impact is that they can be adapted to institutions in other STEM fields in which women are severely underrepresented at all career levels. Some of these recommendations are:
- As a particular point of attention, Implementation Managers (IM) should be trained in **gender issues** as fitting with the European Commission prioritization of gender in research careers, in decision making bodies and in the content of research and teaching.
- **Instructions for internal evaluators** should be clearer on the task of measuring progress in terms of gender equality, and/or gender equality plans, and/or project management.
- The development of the "minimal dataset" (MDS): Most efforts tracking and quantifying career progress of women in their institutions and disciplines often do not go beyond representation (in %) at different career stages. The use of GENERA Minimal Dataset (MDS) and a career progress indicator is therefore indicated, so as to longitudinally collect and compare career data within and across institutional, disciplinary, and national borders.

P2: A toolbox for tailored GEPs – the GENERA toolbox

A1: Within the context of GENERA a toolbox for tailored GEPs was created by collecting more than 100 measures. It is a structured collection of good practices related to the RRI key of gender equality – measures, instruments, and activities –that serve as models for other organisations. This toolbox does not provide an exhaustive picture of the gender equality measures implemented in the ERA. Instead it represents only a small selection of practical examples and structures in scientific organisations within Europe, which were seen as successful. Finally, the toolbox was developed during WP4 of the project, and the institution primarily responsible for its development was the Karlsruhe Institute for Technology (KIT).

A2: The GENERA Toolbox aimed at **assisting GENERA partner organisations** that were in the process of the implementation of gender equality plans (GEPs) **in tailoring their GEPs** and gender equality measures to their needs.

A3: The measures within this toolbox were **collected from a variety of sources** (surveys, experts, own experiences, supplemented by literature review). All of these collected measures and instruments **can directly be implemented into the GEPs or can be structurally integrated** to build a bridge from the current state of gender equality to a better state. They refer to **an ongoing process, which can be updated and expanded.** All of the measures are available in <u>Deliverable 4.1</u>.

All the measures in the toolbox had **a specific categorization** (for every organisation has a unique and different approach to gender equality) and **a specific structure** for their description:



- **Title**: the original title of the measure/action as implemented and recommended
- **Difficulty**: assessment of difficulty of implementation, differentiated between
 - basis: rather easy to implement
 - intermediate: rather moderate to implement
 - experienced: rather difficult to implement
- **Field of Action:** classification in one of six fields of action which were established within the GENERA project
 - 1. Structural Integration of Gender Equality
 - 2. Engaging leadership
 - 3. Flexibility, Time and Work Life
 - 4. Presence and Visibility
 - 5. Gender-inclusive/Gender-sensitive Organisational Structure
 - 6. Gender dimension in Research and Education
- **Objective:** short description of objectives
- **Target group**: recommendations for target groups
- **Description**: detailed description of how the measure/action is in use
- More information: further information to organization and contact person

A specific section was created for the Gender in Physics Days, a measure that aimed to to raise awareness on gender equality issues and enhance structural changes, through the organisation of events that built a collaborative network on gender equality among RPO/RFO/HEI.

Moving further, as already stated, the GENERA toolbox promotes gender equality. What is worth highlighting is that **it focused on the presence of women in different grades of academic careers** – in particular at the higher levels of the academic path and in decision-making positions. Thus, **it addressed the situation of the following groups**:

- Pupils
- Students (undergraduate and graduate)
- PhD students, PhD candidates and research assistants
- Postdocs and mid-career scientific personnel
- Professors
- Management and leadership

The individuals and groups that **this Toolbox addressed as users** are the following:

- At a primarily level, the Toolbox addresses **RFOs**, **RPOs and HEIs**.
- It can be also used by **other organisations**, which have the intention to promote **gender equality** and raise gender awareness at all qualification levels.
- The toolbox is especially **interesting for managers and leaders** who have to take the steps towards gender equality.
- The GENERA Toolbox can be used by the **scientific community (in physics)** based on the principle of "give and take".
- In general terms, it can be used by **any individual who is a stakeholder in gender equality issues** – ranging from those with no knowledge of gender equality to those who have experience with gender equality issues.

A4: No information available.



A5: No information available.

A6: The GENERA Toolbox is a practical guide book – *developed by and for physicists* – that provides information and inspiration on a practical and applicable level, by giving "good examples" and possibilities of proven gender equality measures in the field of physics. It therefore exhibits a broad impact that goes beyond the ecosystem of the organisations/institutions participating in GENERA.

P3: Development of the PAM tool (Planning – Action – Monitoring tool)

A1: For the assessment of long term benefits and impacts a **monitoring tool** was developed, which allowed **each organization to measure its progress towards structural and organizational change (in relation to the RRI key of gender equality)**. This tool was developed during WP3 of the GENERA project and the institution primarily responsible for this practice was JOANNEUM RESEARCH, a research institute in Austria.

A2: The objective underlying the development of this tool was:

- To facilitate the complex process of gender equality implementation in research performing organizations .
- To accompany evaluations by providing up to date information and knowledge about the status of implementation processes (and enabling reflection on actual implementation practices).

A3: The monitoring tool was on the one hand closely related to the objectives and measures implemented in the course of the GENERA project and their respective outcomes, but on the other hand it reached beyond those objectives (applicable in different contexts and research organizations). The monitoring tool built on:

- Various sources like the GENERA status quo assessment conducted in WP2.
- The results of a concept analysis .
- **The logic chart model** (this allowed to identify fields of interventions and their long term impact).
- Concept Analysis: It assessed the coherence between goals, strategic objectives and activities or measures that are implemented by the GENERA project. A vertical perspective assesses the internal coherence, clarity and relevance of the GENERA measures, while a horizontal perspective monitors whether the measures are adjusted to i) other newly developed measures and ii) to the existing policy mix for equal opportunities or HR development is addressed.
 - **Vertical perspective/internal coherence**: e.g. Who participated in formulating the mission and goals of the measure/activity? Are there any trade-offs?
 - **Horizontal perspective/external coherence**: e.g. Have there been activities by e.g. the university to connect/link those measures?
- Logic chart model: The measures, activities and the developed indicators were incorporated into a logic model to display the links between inputs, activities, outputs and outcomes, i.e. the benefits of the measures. Logic models were set up for each

participating university aiming to delineate the individual goals, resources and activities of the implemented measures.

Then, **the monitoring tool evolved around specific questions**, that summarized different aspects of structural and organizational change in research performing organizations. These questions were:

- Have the structural and working conditions for the advancement of women scientists especially for non-tenured scientists improved?
- Did the number of women scientists at different hierarchical levels/career stages increase?
- Was the gender dimension in research content integrated in research and teaching activities like Bachelor, Master or PhDs curricula?
- Did the gender models in research organisations, both at structural and cultural levels, change?
- Did the proposed actions lead to changes of selection processes and of the deployed criteria of excellence? Did the chances of women scientists to succeed in selection panels or committees improve?

A4: No information available.

A5: No information available.

A6: The practice of developing such a monitoring tool had a considerable **impact within the ecosystem of the organisations involved in GENERA and implementing the GEPs**. In other words, the monitoring tool along with overall evaluation process **contributed to**:

- Identifying and comparing implementation practices between different organizations and their achievements.
- Assessing the implemented activities and measures through combining an ex ante and an ex post perspective.
- Identifying organizational changes, institutional progress and benefits.
- Enriching the GENERA learning environment.

4.15 EnRICH - Enhancing Responsible Research and Innovation through Curricula in Higher Education

Project summary: EnRRICH project builds the capacity of staff in higher education to facilitate their students' development towards RRI. It does this by identifying, developing, testing, and disseminating resources, based on existing good practice and trials of new initiatives, to embed the five RRI keys in academic curricula across Europe, with specific reference to science and engineering. It develops case studies with examples for students, teachers, professional trainers and academic staff of HEIs.

Number of practices: 3

P1: The EnRICH tool for educators

A1: The EnRICH tool for educators was developed within the context of the EnRICH project (coordinated by the Vrije University in Brussels), and during WP2 of the project. The institution mainly responsible for its development was Wageningen University in Netherlands. This tool provided insights on:

- What RRI (all RRI keys) in higher education entails and on what principles to take into account when (re-)designing curricula.
- Specific RRI competencies to be acquired by higher education students.
- Concrete steps for setting RRI-driven learning outcomes and for choosing consistent assessment, teaching and learning methods, with a focus on higher education modules (a module in higher education is a single course, often part of a wider program).

A2: The EnRRICH tool aspired to guide educators to (re-) design curricula in higher education from an RRI perspective. The tool did not aim to stimulate the development of new modules about RRI, though this could be possible. Rather, the tool can be used to refresh existing modules from a RRI perspective. Educators can, thus, take their existing educational practices as starting point.

A3: The EnRICH tool was designed with the rationale of **having a number of components**. In other words, it included **three pillars and two elements** which are interconnected.

The three pillars provided the foundation for (re-)designing curricula through RRI lenses. The pillars were:

1. A working definition of RRI in higher education

- "Fostering RRI in higher education curricula is about equipping learners to care for the future by means of responsive stewardship of scientific and innovation practices that address the grand challenges of our time in a collaborative, ethical, sustainable and socially desirable way."
- 2. Design principles for embedding RRI in higher education



- Education for society (principle 1)
- Education with society (principle 2)
- Education to whole persons (principle 3)

3. RRI competence

- The RRI competence comprised a set of capabilities, also called competencies (Figure 2).



Figure 2. The RRI competence as defined in the EnRICH project

The two elements were built on the three pillars, and could further provide concrete insights for embedding RRI within higher education modules. The elements were:

- 1. Articulating learning outcomes
- Related guidelines on how educators should articulate the learning outcomes were created (available in <u>Deliverable 2.3</u>).
- 2. Defining assessment, teaching and learning methods.
- Different learning outcomes can require different assessment, teaching and learning methods. It was suggested to work towards consistency and proper alignment between the character of the learning outcomes chosen and the assessment, teaching and learning methods.

A number of 'steps' took place for developing the tool, its pillars and its elements.

> Designing the first two pillars (a working definition of RRI in higher education and design principles for embedding RRI in higher education)



Step 1: It consisted of **defining the philosophical perspective taken for approaching RRI** (a prospective notion of responsibility, without excluding elements deriving from a consequentialist notion).

Step 2: Existing RRI definitions were studied. Main aspects, related to those definitions, were distilled in the form of keywords describing features of RRI. This led to the initial development of a possible working definition of RRI in higher education curricula and related design principles.

Step 3: It focused on **integrating comments received by EnRRICH partners and advisors** during two consultation workshops.

Step 4: It focused on **analysing the RRI related promising practices in higher education curricula in Europe,** which were collected within the EnRRICH project.

> Designing the third pillar (the *RRI competence framework*)

Step 1: It consisted of **analysing few RRI definitions**, as well as text from selected literature describing processes and **capabilities needed for fostering RRI** (qualitative content analysis). This led to a preliminary set of RRI competencies.

Step 2: This preliminary set of RRI competencies was **discussed with the EnRRICH partners and advisors through two consultation workshops** with the EnRRICH core team.

Step 3: It referred to **analysing promising practices of RRI in higher education curricula**, which were collected within the EnRRICH project.

Step 4: It focused on **integrating comments received by the participants of a workshop led by Wageningen University** and presenting the competence framework within the Living Knowledge conference held in Dublin in 2016. Based on the integration of those steps, an RRI competence framework was developed.

> Developing the two elements of the tool (*learning outcomes* and aspects related to *assessment, teaching and learning methods*)

The two elements were largely inspired by a workshop held for EnRRICH partners in 2016 (led by Dr. Declan Kennedy, University College Cork – a project partner). The insights gained during the workshop were further developed by Wageningen University.

A4: In order to develop the EnRICH tool there was **an interrelation (correlation) with previous educational theories**. For example:

- Instrumental theories suggesting that education is expert-driven.
- **Emancipatory theories** (in line with the social cognitive theory and socioconstructivist mode of education) suggesting that education is about providing space for autonomy and self-determination.



A5: No information available.

A6: The EnRICH tool had **a considerable impact** not only for the institutions and individuals participating in the project, but **for all individuals belonging to the field of education**:

- It contributed to the understanding of the idea of integrating RRI to academic curricula (development of an initial definition of RRI in academic curricula).
- It can overall guide educators to revitalize their modules by applying **RRI driven** educational design principles, learning outcomes and strategies.

P2: Piloting of RRI teaching practices (based on multi stakeholder input)

A1: Nine exemplar pilots were conducted as part of the EnRRICH project so as to embed RRI in higher education curricula. The pilots represented a 'deep approach', which consists of engaging students in authentic learning processes at the cross-road between the classroom and society; students can identify or be presented with a specific problem faced in real-time by certain actors in the world and be asked to address it academically and collaboratively. The institution primarily responsible for these pilots was University College Cork (in Ireland).

A2: These pilots aimed to facilitate **the development and enactment of teaching approaches to integrate RRI in modules and programmes**. More specifically, they aimed to:

- **Provide rich detail** on the design, execution and evaluation of several **curricular initiatives.**
- Inspire the reader.
- Illuminate potential pathways towards implementing similar approaches and to identify the facilitative elements and key considerations prior to embarking on a pilot.

A3: First of all, it should be underlined that at an initial stage project members and their institutions were involved in approximately 150 RRI pilots. Then, project members drew on these extensive activities to develop and refine the activities that became the nine exemplary pilots.

The exemplar pilots varied considerably in length, target audience, and design. Therefore, they offered a broad range of learnings for several different contexts;

- They referred to a broad range of disciplines.
- They addressed different target groups (undergraduate and postgraduate students).
- Depending on the module or programme in which the pilot took place, **students** could connect with a number of different RRI keys.

In the Figure below (Figure 3) there is a brief description of the structure of the pilots (the institution that delivered the pilot, the student level and the discipline it addressed). A complete description of them along with the teaching activities they entailed is available in <u>Deliverable 3.2</u>.



Dublin Institute of Technology	Undergraduate and Postgraduate (Masters) students		
(DIT)	Spatial planning - Environmetal Management		
_	Local Development & Innovation, and Sustainable Development		
IrisCaixa, Living Lab for Health	Postgraduate (Masters) students		
	Education		
-	Science Communication		
Vrije University of Brussels (VUB)	Undergraduate and Postgraduate (Masters) students		
-	Interdisciplinary		
Wageningen University (WU)	Postgraduate (Masters) students		
-	Interdisciplinary		
University of Sassari (Uniss)	Postgraduate (Masters) students		
	Social Work and Social Policy		
-	Foreign languages and Cultural Mediation		



University of Lion (UdL)	Undergarduate (final year) students	
	Interdisciplinary	
University College Cork (UCC)	Postgraduate (PhD) students	
(000)	Interdisciplinary	
University of Vechta	Undergraduate and Postgraduate (Masters) students	
	Interdisciplinary	
Queen's University Belfast (OUB)	Undergraduate students	
(,	Education	
	Social Sciences and Social Work	
	Figure 3. The nine exemplar pilots of the EnRICH project	

It is worth underlining that **engaging with multi-stakeholder perspectives** was a key aspect in the process. A highlight was the **project conference** which was held in Dublin in June 2016 with attendance from 44 students; 47 **CSOs**; and 163 **HEI/researcher/other delegates**. A **policymakers' forum** was also held to examine how RRI might be built into higher education policy (views of policymakers were also sought at other events).

A4: Various partnerships with civil society organisations took place, since developing and implementing a new RRI pilot can be time consuming (especially when employing a 'deep' approach to integrating RRI). Therefore, many of the partners engaged in these pilots had previously engaged with a community partner. For instance:

- In the case of University of Sassari, the community partners involved in the pilot had a relationship going back to 2011. The pilot led to the subsequent formation of a Permanent Partnership Instrument forming a permanent link between the university and the community partner.
- In Dublin Institute of Technology, EnRRICH members leveraged pre-existing relationships with community organisations. DIT's long standing partnership

with Northside Partnership provided a variety of linkages and access points for students from varying disciplines and levels of study to collaborate on.

A5: When implementing the pilots, some **key considerations emerged**, which created certain i**mplications**. More specifically:

- Some institutions experienced significant resistance to the term RRI.
- In some countries, the term RRI could be perceived as *just another term* in a series of EU imposed terms, or, an umbrella term to describe what many HE individuals were doing already, e.g. participatory research, public engagement etc.

A6: Upon the completion of the pilots, valuable insights were gained towards the integration of RRI in academic curricula. **These insights can facilitate the RRI integration in any institution that aspires to proceed to such an integration** (a broader impact). In more details:

- The pilots indicated **the benefit of pedagogical approaches such as inquirybased learning and community-based research** to foster RRI competences in students.
- It was suggested that students' understanding can be broadened beyond their discipline through the use of an RRI lens.
- Interdisciplinary programmes proved to be particularly suited to the integration of RRI in curricula.
- The key recommendations that emerged by reviewing the pilots provide inspiration on how to design and deliver a curricular intervention. Especially if the pilots are combined with the EnRICH tool for educators (P1), they provide a very useful roadmap for how to integrate RRI in a module or programme.

P3: Science Shops for integrating RRI in academic curricula

A1: Within WP4 of the EnRICH project, the incorporation of RRI in higher education curricula was supported and facilitated by Science Shops (and other similar community knowledge exchange mechanisms). In general terms, Science Shops promote the RRI key of Public Engagement and manage relationships with CSOs and academic staff. During the EnRICH project new Science Shops were set-up and mentored, while already established ones were supported, and the overall practice was coordinated by Vrije University in Brussels (VUB). The participating Science Shops and the academic institution they cooperated with are listed below:

- 1. Science Shop Queen's University Belfast (QUB)
- 2. Community-Academic Research Links (CARL) University College Cork (UCC)
- 3. Living Lab for Health IrsiCaixa Institute for AIDS Research Barcelona (IrsiCaixa)
- 4. Laboratorio FOIST per le Politiche Sociali e i Processi Formativi University of Sassari (UNISS)
- 5. Science Shop Vechta/Cloppenburg University of Vechta (Vechta)
- 6. Wetenschapswinkel Brussel Vrije Universiteit Brussel (VUB)
- 7. Wetenschapswinkel Wageningen Wageningen University & Research (WU)



- 8. Science Shop Corvinus University Budapest (CUB)
- 9. Science Shop Vilnius College of Technologies and Design (VTDK)
- 10. Boutique des Sciences University of Lyon (Lyon)
- 11. Students Learning With Communities Dublin Institute of Technology (DIT)

A2: Science Shops aimed to **contribute to the process of RRI integration in academic curricula**, by creating more opportunities for staff and students in HEIs to understand and engage in experiential learning.

A3: With respect to the **mode of operation** of the Science Shops, all 11 involved Science Shops followed more or less **the same way of work but had their own local and individual character**. For example, they **operated under different names**. Almost a quarter of them didn't use the name Science Shop or a translation of it. Some alternatives were: Community-Academic Research links (UCC), and FOIST Laboratory for Social Policies and Educational Processes (UNISS).

Concerning **staff numbers** there were also some differences but overall, Science Shops were **rather small units, located in different departments**. Their staffing ranged from 0,5 to 5,5 FTE (full-time equivalent) but once over 2 FTE, most Science Shops focused on other activities, in addition to Science Shop work.

Most of the university based Science Shops were **based in central departments** such as Directorate of Student Development (DIT), while others were **based in faculties:** Department of Humanities and Social Sciences (UNISS).

When it comes to the scientific domains Science Shops referred to, social sciences were more represented in EnRICH (even if, in general terms, Science Shops refer to all scientific domains). Finally, students of various levels were engaged: Master students, Bachelor students and even secondary students in the case of the Living Lab for Health (IrsiCaixa).

Each Science Shop worked on various projects. Some examples are listed in the table below.

Academic institution engaged	Science Shop project
Queen's University Belfast	"Preventing Reed Beds from Freezing"
University College Cork	"Influence of disturbance on shorebird behaviour"
IrsiCaixa Institute for AIDS Research Barcelona	"Healthy Minds"
University of Sassari	Development of a CBR (community- based rehabilitation) program along with concerner social workers in the city of Sassari.
Vechta University	A field study on buying behaviors
Vrije University of Brussels	An exploratory cross-sectional investigation on alcohol abuse
Wageningen University & Research	Research into the short-term and long-term influences on 'nature



	weeks' in the Municipality of The
	Hague
Vilnius college of Technologies & Design	A study on traffic safety at the Vilnius crossroads

Table 24. Examples of projects that the EnRICH Science Shops undertook

Finally, a Community of Practice (CoP) was set-up to exchange and pilot good Science Shop practices. At the start, WP leader VUB sketched what a CoP is and what it could look like. Then, the CoPs participated in:

- Face-to-face meetings, along with alongside peer evaluation visits/activities in other EnRRICH work packages and/or during conferences or other scheduled meetings and visits.
- **22 mentoring visits** combined with attendance to other events such as Science Weeks, RRI workshops and Conferences.
- **10 mentoring sessions** -beyond the consortium- at institutions that were not part of EnRRICH, but were interested in learning more about the Science Shop approach
- **25 mentoring discussions** mostly through phone or Skype within the project consortium
- Four webinars on different topics, that were based on the issues that were expressed within the Community of Practice: start-up issues, how to engage lecturers, a combination of several challenges, and sustainability.

A4: Science Shops exhibited a systematic collaboration with Civil Society organisations (CSOs); there was engagement from approximately 240 civil society organisations in around 550 groups and individual projects, with around 220 supervisors.

A5: Various **obstacles** emerged:

- **Technical obstacles:** It was difficult to find a way to register interactions and information within the Community of Practice (CoP) that supported the Science Shops. Using a closed part of the EnRRICH website for that purpose turned out to be impossible for technical reasons. For this reason, an online community was set on Wiggio, but once again technical obstacles emerged; Wiggio officially closed down their free service, which forced the end of online registration of CoP activities.
- **Budget/Staff cost:** Some Science Shops reported that there wasn't any particular budget allocated to cover staff costs for Science Shops, nor lecturers' engagement in projects
- **The term RRI**: At the start of the project, the umbrella concept of RRI was relatively new and unknown in academic environments. The lack of awareness of, and training on, the RRI concept among higher education/academic staff was a barrier for some Science Shops to convince lecturers to take part in participatory initiatives with CSOs.
- **Innovation in Science Shops**: Participating Science Shops were stimulated to start new collaborations, try new models etc. These innovations often proved to be challenging within existing structures.

- **Missing links between teaching & research departments**: There was an ongoing debate about whereabouts in a higher education institution a Science Shop is better based (e.g. in an academic department or in the central research office).
- Science Shops based outside higher education: Two of the EnRRICH Science Shops were not based in a higher education institution. Both found it quite challenging to connect their projects with higher education.
- **Sustainability of Science Shops:** The EnRRICH project funding guaranteed Science Shops could keep on existing for the duration of the project. But this didn't ensure Science Shop sustainability on the longer term.

A6: The impact of the Science Shops can be summarized in the following aspects:

- Science Shops functioned as Public Engagement hubs in their corresponding institutions; they provided training and support, build institutional cohesion, and managed relationships with CSOs and academic staff (impact inside the ecosystem of the organisations participating in the project).
- Science shops were **tested and functioned as mechanisms to integrate RRI in curricula**, through responding to the research needs of society as expressed by civil society organisations (CSOs).
- Three new Science Shops were set- two in areas where Science Shops have not existed before (Hungary and Lithuania) and one in a research institute (Spain). This initiative has contributed to wide spreading the functions of the Science Shops, and consequently wide spreading Public Engagement and the links between research and society (a broader impact).

5. Summary

The previous chapters represented the rationale underlying the implementation of WP3 and more specifically Task 3.2, as well as the inventory of RRI practices (RRIGIPs) and their analysis conducted within the context of Task 3.2. The final section of this deliverable constitutes the summary of the aforementioned analysis. At first, there is a reference to a few general assumptions towards the nature of RRI, which were verified after the Task 3.2 analysis. Afterwards, certain 'tendencies' (or trends) that have been recognized with respect to the implementation of RRI governance practices are being highlighted. These tendencies are related to RRI holistically or to any its basic tenets - keys. Before proceeding to any further conclusions, it is worth underlining that the task referred to the creation of an inventory including a limited but considerable number of practices among the exhausting number of them that can be detected. More specifically, 43 practices implemented in 15 RRI projects were analysed; the primary selection included 80 projects which were then narrowed down to approximately 50 projects, before reaching the final 15. Therefore, emphasis should not be placed on an attempt to reach doctrinal conclusions or create absolute and universal guidelines, but on the innovativeness and rationale underlying the 43 practices that were selected through a thorough selection procedure and a solid methodological framework (see Chapter 3).

5.1 The contextualization of RRI

To begin with, the analysis of the practices verified the 'assumption' that RRI can be seen as a powerful and 'flexible' concept -or even as an 'umbrella' term- that can be subject to various interpretations. Owing to these different interpretations, different categories of organisations and stakeholders get involved in transparent and interactive procedures while promoting RRI –either as a set of resources or with an emphasis to a specific RRI key.

It is worth underlining that when contemplating upon RRI practices, **the 'easy' decision would be to adopt a normative political theory and approach**, where emphasis is placed on what something 'ought' to be and on what values and actions one should be taking into account for reaching the 'correct' situation. In the RRI case, if adopting the aforementioned theory and perspective, all involved actors would proceed to statements and actions assuring rather 'superficially' responsible research and innovation actions, based on commonly accepted norms. Therefore, so as to avoid such a situation, there is **a need to highlight that RRI aims at reflexive societies** (defined by individuals shaping *their own* norms, tastes, politics etc.) **and is context-dependent**; embedding RRI into the DNA of an organization or a system is a complex procedure, that needs to take into account the existing problems, the aspired future situations, as well as the agency and the capacities of the actors / individuals / organisations attempting to achieve an RRI integration.

The weakening of a normative approach embedding RRI and the consequent construction of 'self-tailored' RRI profiles are reflected in the RRI practices that have been included in the inventory and have been critically analysed. In each practice, RRI is enhanced in a differentiated way and 'established' through different tools and strategies depending on the nature and needs of each RPO, and even terms such as 'transformation' and 'innovation' are being encountered differently. Thus, the following section represents certain tendencies and common rationales which are noticed in RRI practices and can open new windows of opportunity for responsible R&I (eco)systems, but even these were subject to subtle differentiations depending on their context of application.



5.2 Tendencies (and trends) in RRI practices

5.2.1 RRI practices with a focus on an RRI unified approach

As it has already been reported in Chapter 3, promoting the Governance of RRI signifies any form of coordination or action within an organization (or in the interaction with other stakeholders), designed to foster RRI as whole set of resources without an emphasis on a specific key, as well actions focusing rather explicitly on a specific key. The inventory of RRIGIPs included a number of projects that enhanced the RRI unified / holistic approach, and their practices embraced almost all aspects of RRI; *FIT4RRI, FoTRRIS, RESPONSIBLE INDUSTRY, MARIE* and *JERRI*.

With respect to the above projects and corresponding practices, it was first of all identified that they can be separated in **theory-oriented approaches** and in practice-oriented approaches. In the former category, a usual procedure is attempting to investigate the current situation of RRI in a specific field (e.g. industry) by reviewing previous literature and RRI-related discourse, conducting interviews with individuals involved in related practices or even examining related case studies. All these can also be supplemented by conducting actual pilot studies for examining a more in-depth a potential application of RRI, as well as by assessing the attitudes and expectations of related stakeholders (e.g. through a Delphi study) that may be potentially involved in relevant RRI implementations. When there is a theory-oriented approach, a considerable practice and usually the **final step** in a series of practices is the **creation of an exemplar implementation plan or an RRI framewor**k (e.g. the RESPONSIBLE INDUSTRY Framework), that provides valuable insights and suggestions on measures and principles for integrating RRI in a specific field.

On the other side, there are the **practice-oriented approaches** that do not remain on the level of creating an RRI plan, but also apply it in practice and reach more robust suggestions. In this case, various experiments can be conducted (e.g. Co-creation experiments in FIT4RRI and Transition experiments in FoTRRIS), as well as Transformation and Action plans (e.g. JERRI and MARIE) that can be applicable in different fields and areas of interest. What is worth highlighting is that these experiments and plans attempt to promote RRI as a whole and almost all of each keys; for instance, different but interrelated experiments may be included in one project with each of these experiments addressing a different RRI key. Local problems and challenges may also be taken into account when designing such actions, consequently leading to an interrelation with regional policies (e.g. Smart Specialization Strategy – S3 in MARIE). In an ultimate analysis of these practice-oriented actions, one can notice that their impact resides in evoking new governance structures, (long-term) institutional transformations, as well as a broad knowledge transfer in the sense of creating policy guidelines or training tools (e.g. FIT4RRI training tools on RRI and Open Science). All these aspects mentioned towards the tendencies of practices of an RRI unified approach are also depicted in the figure below (see Figure 4).


- Innovation aspects
 - Taking RRI out of the academia. For instance, linking it to S3 and placing an emphasis on users (MARIE)

indications on the fact that the complexity and variability in a field too great to reasonably expect that a one size fits all plan can be applied to all actors

research and innovation processes

Figure 4. RRI practices focusing on an RRI unified approach

5.2.2 RRI practices with a focus on Gender Equality

Besides encountering RRI as a whole set of resources, several RPOs decide on promoting or even 'institutionalizing' a specific RRI key, such as the key of Gender Equality. In this case, common rationales and action plans were also detected in the RRI inventory (see Figure 5). These practices were embedded in the following projects: *EQUAL-IST, STAGES, GENERA*.

To begin with, the key practice when attempting to effectively deal with gender issues and 'establish' gender equality within a system or organization is the creation of Gender Equality Plans – GEPs. These plans have to be contextualized and self-tailored to the needs of each RPO, and various processes can ensure that an RPO primarily detects its needs and the conditions hindering or favoring gender equality. For instance, in the case of the EQUAL-IST projects, internal gender audits in all participating RPOs provided a complete picture of the internal (in)equality in each organization. Moving further, each GEP should include specific goals comprised of several actions that refer to different fields such as work-life balance, gendering in S&T processes or changes in organizational culture and formal/informal behaviors (e.g. STAGES). The execution of these actions can also be facilitated by means of cocreation and participatory co-design that involves communication and exchange of ideas / practices among different RPOs that attempt to promote the key of gender equality (e.g. through online platforms and virtual communities). Monitoring and evaluation mechanisms concurrently ensure the progress and quality of the GEPs. Finally, the application of contextualized GEPs can lead to the development of tools, policy guidelines and recommendations that have a double effect:

- On the one side, they trigger institutional changes in the RPOs applying the GEPs and corresponding tools/policies. These changes can refer to the creation of monitoring mechanisms for GE dynamics, to the development of networks for female researchers, to the creation of specific communication teams disseminating gender equality actions and especially to the process of gendering the contents and methods in scientific research.
- On the other side, they prove to be a valuable source of new knowledge and inspiration, by providing practical examples and evoking further structural changes at national and EU level and enriching already existing tools (e.g. the EIGE tool).





Figure 5. RRI practices focusing on Gender Equality



5.2.3 RRI practices with a focus on Public Engagement

A number of institutions and organisations often attempt to enhance the RRI key of Public Engagement, which ensures that society and various stakeholders can be listened to and participate in the stages of R&I. In the RRI inventory, the practices enhancing and promoting the key of PE were detected in the following projects: *INHERIT*, *PE2020*, *BigPicnic*.

The RRI practices enhancing public engagement can be separated in two distinct categories; there are the practices that refer to the compiling of PE inventories or catalogues including a collection of PE mechanisms and initiatives, and the ones that involve interactive activities for actively engaging the public in R&I processes. To begin with, the construction of PE inventories is mainly realized through desk research, through the examination of previous literature or by receiving feedback on innovative initiatives by partners and external stakeholders. These collections of promising PE practices are usually found on an online database (e.g INHERIT database, PE2020 inventory). Finally, their impact resides in a broad knowledge transfer, in terms of enriching the collection of PE initiatives at a worldwide level and in terms of triggering -through inspiring examples- changes in various citizens' (and society's) behaviours and lifestyles.

Then, proceeding to the **practices for an active engagement of the public**, these often entail a collaboration with external stakeholders and experts in the issue addressed, and can take various forms; visioning and scenario planning exercises (e.g. Future 2040 scenarios in INHERIT), focus groups and citizen consultation exercises, household surveys, science cafés and exhibitions with multiple PE activities (e.g. BigPicnic). It has been noticed that these practices **tend to address a considerable societal problem**, whether this refers to the Horizon 2020 societal challenges and the seven challenges posed by the EC, or to a specific area facing contemporary challenges, like for instance the area of food security in BigPicnc. These practices then entail the development of toolkits, policy guidelines and recommendations (e.g. Science café toolkit and Co-creation navigator in BigPicnic) for **providing triggering examples to actors potentially aiming to enhance the RRI key of public engagement**. Ultimately, these practices result in **bridging the gap between science/research and society** (at a pan-European or international level) and at the same time creating a space for a productive dialogue (for a depiction of all the above practices see Figure 6).





Figure 6. RRI practices with a focus on Public Engagement



5.2.4 RRI practices with a focus on Science Education

As one of the basic tenets – keys of RRI, science education is an aspect very often addressed in RRI projects and practices. The Task 3.2 inventory and analysis provided valuable insights in science education, through the listing and analysis of the practices embedded in three projects: *CREATIONS, ENGAGE, EnRICH*.

Science education practices in RRI projects can be classified in different ways, depending for instance on whether the focus in on primary/secondary education system or on higher education, or on whether they refer to *science education* in the sense of STEM or in the sense of embedding RRI principles in teaching methods (RRI-oriented teaching) (see Figure 7). From the sample of practices included in the RRIGIP inventory, the ones addressing the primary or secondary education tend to refer to the creation of pedagogical-teaching materials that enhance the STEM disciplines along with socio-scientific dimensions, or to the development of pedagogical frameworks (e.g. the CREATIONS framework). In addition, virtual communities of teachers, scientists and students are being created and there is room for sharing and assessing educational materials or for organizing workshops and training events. Concurrently, for designing science education practices in a responsible manner, promoters of such practices tend to take into account already existing and properly elaborated educational theories and tools (e.g. the group discussion tool in ENGAGE). The impact of all these practices refers to the development of new 'taxonomies' for teaching activities that also promote open learning and open schooling (projects related to community's needs), as well as to the fact that the involved actors have the opportunity to gain a deeper understanding on the nature of science and its role in society and for society -an issue of utmost importance when contemplating on contemporary societies.

In the case of practices that **promote science education in higher education (academia)**, the focus can be on promoting RRI-oriented teaching; RRI-driven assessment, teaching and learning methods. Specific tools for educators (e.g. the EnRICH tool) can be developed, that guide them on how to **redesign academic curricula from an RRI perspective**. A piloting of RRI teaching practices can also take place (so as to test in practice the RRI perspective in teaching and in various disciplines). It is worth underlining that a key practice that can accompany the practices above is public and stakeholder engagement though, for instance, science shops or forums with CSOs.





Figure 7. RRI practices focusing on Science Education



5.2.5. RRI practices with a focus on Open Access

The final key encountered in the practices of the RRIGIP inventory and within the project *RECODE*, was the one of Open Access. Relatively few practices refer to the promotion of the specific key, since most often the emphasis is placed on creating relevant guidelines. Nevertheless, below there is a description of the practices detected in Task 3.2 analysis (also see Figure 8).

To begin with, the aim of such practices has an anchor point to **ensure open access to research data.** Therefore, one practice encountered refers to **primarily examining the open access and data preservation issues that are often been encountered in both natural and social sciences research systems**. Case studies entailing workshops, interviews and collaboration of external stakeholders can be conducted while taking into account various dimensions, such as emerging legal and ethical questions or institutional and governmental policy issues. Such a practice has an impact on the organisations participating in the case studies, since they exchange good practice principles and gain a deeper understanding of open access issues.

Then, moving further, a considerable practice with a major impact is **the development of a framework – policy guidelines (towards research institutions, funders etc.) that ensures open access and data dissemination and prevention**, and assists relevant stakeholders to foster related efforts in their organizations. In order to develop such a set of guidelines, one should take into account related case studies (like in the RECODE project) and examine previous literature or relevant work of EC funded projects. The **European landscape can actually be reformed** through the use of such policy recommendations, and involved actors can gain a better understanding of the barriers, good practices and policy needs associated with open access to scientific data.



building activities)

 Different disciplines can be selected (natural and social ones) Various strategies for examining the issues under discussion: Literature review Workshops Interviews Stakeholder engagement can be a key element 		 Case studies for examining open access and data preservation issues often encountered Various aspects can be taken into account (e.g. RECODE project): Stakeholder values Institutional and governmental policy issues Grand challenges (e.g. technological) Legal and ethi cal questions 						 Development of policy guidelines for open access and data dissemination and prevention Aiming at assisting stakeholders in furthering the goals of open access to research data in each of their organizations, as well as at encouraging the development of consensus-building within the open access ecosystem 		 Employing results of related case studies (e.g. RECODE) Conducting a review of scholarly literature, policy documents, reports and significant work of other EC- funded projects Targeting different categories of related stakeholders: Research funders Research funders Research institutions Publishers Data managers 	
		ct (for the orgar studies) eneration of a le oducing studies cchanging good levant stakehole hrough network	nisations participa earning process; of good practice practice principles ders and institutio ing activities and	ting in the and s with ons consensus	 A broader impact extending to the European landscape: Guidelines that can contribute to the framework of EC A better understanding of the barriers, good practices and policy needs associated with open access to scientific data Changes in the strategic, competitive, economic and social sphere 						

Promoting Open Access to research data

Figure 8. RRI practices focusing on Open Access

5.3 Final remarks

The sub-chapters above examined certain aspects of the nature of RRI and suggested certain tendencies that were identified in the practices promoting RRI and any of its basic keys. The examination of these tendencies – trends and, in general terms, the RRIGIP inventory and its corresponding analysis shall contribute to the development of the envisaged, transformative experiments of TeRRItoria. Valuable input can be gained through the inspiring practices and 'strategies' that several European organisations employed for establishing truly responsible R&I systems and ameliorating their core, internal mechanisms. Concurrently, this input in correspondence to a self-reflection and contextualization process within each RPO can serve as an indication on how to ensure an efficient RRI uptake that corresponds to specific structures and aims. In a final stage, the input and indications gained are combined with the output of Deliverable 3.1; this results in a map of approaches, policies and tools for enhancing Territorial RRI (to be adopted in TeRRItoria WP4 and WP5).



References

Martí, G.M.H., 2006. The deterritorialization of cultural heritage in a globalized modernity. *Transfer, JOURNAL OF CONTEMPORARY CULTURE* [online]. (1), 91-107. Available from: <u>https://www.llull.cat/rec_transfer/webt1/transfer01.pdf#page=93</u> [Accessed 2nd June 2019].

Marschalek, I. (2017). Public engagement in Responsible Research and Innovation. A Critical Reflection from the Practitioner's Point of View. Ph. D Thesis. University of Vienna. Available https://www.zsi.at/object/publication/4498/attach/Marschalek_Public_Engagement_in_ RRI.pdf [Accessed 10th March 2019].

Owen R. *et al* (2012) Responsible research and innovation: From science in society to science for society, with society. *Science and Public Policy* [online], 39 (6), 751-760. Available from:

https://s3.amazonaws.com/academia.edu.documents/31624201/Owen_Macnaghten_an_d_Stilgoe_SPP_RI_.pdf?response-content-

disposition=inline%3B%20filename%3DOwen_Stilgoe_and_Macnaghten_2012_Respons. pdf&X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-

Credential=AKIAIWOWYYGZ2Y53UL3A%2F20190913%2Fus-east-

<u>1%2Fs3%2Faws4_request&X-Amz-Date=20190913T081425Z&X-Amz-Expires=3600&X-Amz-SignedHeaders=host&X-Amz-</u>

<u>Signature=700de4595261da101db75bf38cd78a733f39ef7a1ffbe1b7765b62c50cc6125a</u> [Accessed 5th June 2019].



Annex 1 – Inventory of RRIGIPs

No	Practice	Corresponding		
1	Creation of National Mini reports			
2	Gender Audit in RPOs	EQUAL-IST		
2.	Creation of the crowdsourcing platform			
5.	"CrowdEquality"			
4.	GEPs – Gender Equality Plans in IST- ICT Institutions	EQUAL-ST		
5.	Utilising existing research infrastructures of frontier	CREATIONS		
	research institutions enriched with online tools			
6.	Development of the CREATIONS Demonstrators	CREATIONS		
7.	Extensive literature review and analysis of RRI	FIT4RRI		
	(Responsible Research and Innovation) and OS (Open			
	Science)			
8.	4 co-creation experiments	FIT4RRI		
9.	Development of training tools and strategies on RRI and OS	FIT4RRI		
10.	Action plans for introducing gender-aware	STAGES		
	management in RFPOs			
11.	Ongoing and final evaluation of the Action Plans	STAGES		
12.	Development of Guidelines for Gender Equality	STAGES		
	Transformations in RPOs			
13.	Topicals (ADOPT) - inquiry-based teaching through	ENGAGE		
	science-in-the-news contexts and open curriculum			
	materials			
14.	Sequences (ADAPT) - Open Online and just-in-time	ENGAGE		
15	Projects (TRANSEORM) Partnerships system for	ENGAGE		
15.	school-scientist projects	ENGAGE		
16	Development of an online co-RRI platform	Fotres		
17.	Co-RRI Transition experiments (TEs)	FoTRRIS		
18.	Creation of competence cells	FoTRRIS		
19.	Online Database of Promising Practices related to	INHERIT		
	"living moving, consuming" (INHERIT Database)			
20.	Visioning and scenario planning (Future 2040	INHERIT		
	scenarios)			
21.	Transformation of best practices into 15 case studies	INHERIT		
	related to "living, moving and consuming"			
22.	Case studies for the examination of open access and	RECODE		
	data preservation issues (related to four dimensions)			
	through stakeholder engagement mechanisms			
23.	Policy guidelines for open access and data	RECODE		
	uissemination and prevention			



24.	Synthesis of current discourses on RRI in the industrial context (based on a literature review, stakeholder interviews, case studies and Horizon scanning reports)	RESPONSIBLE INDUSTRY
25.	International Delphi Study of RRI in industry (along with an international multi-stakeholder workshop)	RESPONSIBLE INDUSTRY
26.	Pilot case-studies related to the domain of information and communication technologies (ICT) for health, demographic change and wellbeing	RESPONSIBLE INDUSTRY
27.	Testing-Industry evaluation (and development of the final framework)	RESPONSIBLE INDUSTRY
28.	An updated inventory and a catalogue of current and prospective European PE innovations	PE2020
29.	Context-tailoring and piloting of best practice PE processes	PE2020
30.	Development of an accessible net-based PE design toolkit for science policy actors (PE2020 tooklit)	PE2020
31.	Action plans based on Quadruple Helix, Open Innovation, Information & Tools for RRI application in S3	MARIE
32.	Big Picnic Basket: Development of outreach exhibitions	BigPicnic
33.	Science cafés on the topic of food security	BigPicnic
34.	A co-creation navigator	BigPicnic
35.	RRI Transformation Plans in Fraunhofer (including a long-term vision)	JERRI
36.	RRI Transformation Plan in TNO (including a long-term vision)	JERRI
37.	International mutual learning process	JERRI
38.	GEPs for the field of physics (potential of application in other research fields)	GENERA
39.	A toolbox for tailored GEPs – the GENERA toolbox	GENERA
40.	Development of the PAM tool (Planning – Action – Monitoring tool)	GENERA
41.	The EnRICH tool for educators	EnRICH
42.	Piloting of RRI teaching practices (based on multi stakeholder input)	EnRICH
43.	Science Shops for integrating RRI in academic curricula	EnRICH

