SciShops

ENHANCING THE RESPONSIBLE AND SUSTAINABLE EXPANSION OF THE SCIENCE SHOPS ECOSYSTEM IN EUROPE

D4.2

Practitioner roadmap and methodology toolkits

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Executive summary

Science Shops revolve around some fundamental concepts on discussing, consulting, involving, collaborating, supporting and empowering different stakeholders. This deliverable, "Practitioner roadmap and methodology toolkits", provides guidelines on how to implement research and non-research projects in the context of Science Shops. Through the use of a roadmap, tools (including RRI) and participatory research methods, this deliverable supports the development of a strategy for community-based participatory research and engagement between different stakeholders and the Science Shops.

The results of this deliverable point to very similar approaches implementing research and non-research-based projects, such as a strong stakeholders strategy for involvement and participation, and a comprehensive dissemination strategy. The deliverable has three main sections: a short introduction to engagement in the Science Shops context; roadmap and respective tools, and a special section with comprehensive resources to support CBPR and participatory activities. The roadmap is organised in three main phases: stakeholders engagement; project development and implementation; and dissemination and evaluation. The roadmap provides an understandable approach and straightforward step-by-step guide for implementing projects in Science Shops. For each step, it includes different resources and tools to support its implementation.

This deliverable also addresses one of the greatest challenges for Science Shops: the lack of research questions formulated by the community. For that, the roadmap includes specific steps to address this challenge, e.g.: establishment of a community advisory board or development of common community and research question and respective hypothesis.

The roadmaps take into consideration the well-known partnership approach to Science Shops that equitably involves, for example, community members, organisational representatives, researchers and other stakeholders in all aspects of the project implementation and in which all partners contribute expertise and share decision making and ownership.

Please note that this deliverable provides an overview of best practices on implementing projects connected with Science Shops and builds on the excellent tools, guides, references and previous work already developed by different individuals, institutions and projects. We have carefully tried to provide the respective references to previous work.

This is the 2nd deliverable of a set of documents that provide some analysis, models, frameworks and specific guidelines on running Science Shops. These documents provide a strategy for community-based participatory research and knowledge transfer from Science Shops to civil society.

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List of Acronyms

CBPR - Community-Based Participatory Research

EU – European Union

IPR – Intellectual Property Rights

NPO – Non-Profit Organisation

NGO – Non-Governmental Organization.

PE – Public Engagement

OECD – Organisation for Economic Co-operation and Development

RRI – Responsible Research & Innovation

SME – Small and Medium Enterprise

USA – United States of America

UK – United Kingdom

WUR – Wageningen University & Research

1. Introduction

SciShops.eu (Enhancing the Responsible and Sustainable Expansion of the Science Shops Ecosystem in Europe) is a Horizon 2020 project involving 18 partners in 13 European countries aimed at promoting the growth of socially responsible community-based research in Europe. The project explores how different types of research organisations, such as research institutes, large enterprises, SMEs, NPOs and universities can develop sustainable Science Shops with the ambition of establishing ten new Science Shops during the course of the 30-month project. The project runs from September 2017 until February 2020.

Work Package 4 of the project is dedicated to the development of a strategy for community-based participatory research. This document, which forms the deliverable of task 4.1, is intended to guide Science Shops in implementing community-based participatory research (CBPR) projects by providing insights, tools and methods, as well as specific Responsible Research Innovation (RRI) tools for effective knowledge exchange in the CBPR process between Science Shops and civil society.

Community based participatory research (CBPR) is a way of organising research where scientists work together with non-governmental organisations, communities and other groups of society to co-create new knowledge or understanding about community issues. The new knowledge can later be used to attain change in the community.

By answering to civil society organisations and local communities' requests, Science Shops "stand at the junction where science meets society" (Science Shops: knowledge for the community 2003). Research or other projects run by Science Shops are by definition community based, but in practice there are varying degrees of community and other stakeholders' involvement. This roadmap aims to reveal various ways in which stakeholders can be involved and to help to ensure the participatory dimension of Science Shop projects. It does so by providing a step-by-step approach to CBPR process, as well as incorporating approaches from the practice of public engagement (PE) in science, which reveal even more possibilities for stakeholder and citizen involvement.

Science Shops started in 1970s as research focused enterprises, where research would be done in response to society needs (Science Shops: knowledge for the community 2003). However, the contemporary practice of Science Shops and Science Shop-like organisations show a wider variety of projects and activities within the projects, spanning beyond research and incorporating educational activities, stakeholder debates, or even engagement of the general public (more on that see in Chapter 2 and SciShops project deliverables 2.2. (Garrison et al. 2018), 2.5. (Stanescu et al. 2018), 4.1 (Schroyens et al. 2018)). This development reflects the increase of participatory research approaches in academia in general and the ever stronger calls for public engagement with science. In answering this trend, this roadmap aims to encourage more active use of participation activities in Science Shops. It does so by including a chapter on Public engagement role of Science Shops (Chapter 2) and incorporating a separate part into project roadmap focused on engagement activities (within the Chapter 3).

The main part of the deliverable, Chapter 3 "Roadmap and toolkit to Science Shop projects" consists of three sections (Figure 1).

Figure 1. Overall structure of the practitioner roadmap

The first section "Phase I: Stakeholder engagement" describes the first phase of community based projects and deals with the involvement of community organisations, as well as students, supervisors, or other staff that will implement the project. This phase applies to any type of projects run by Science Shops. The second section "Phase II: Project development and implementation" is subdivided into two separate parts for research and for stakeholder engagement activities. CBPR and participatory activities can be undertaken in parallel, if the research project calls for involvement of stakeholders beyond the community organisation or a wider public. Thus, the practitioners using this roadmap are encouraged to get acquainted with both parts and switch between them according to the needs of the specific project. The final section "Phase III: Dissemination and evaluation" again applies to any type of project.

There is a plethora of guides and toolkits for designing and implementing CBPR and participatory activities (see Section 4); for participation activities, there are those that are addressed for government institutions, for research institutions, as well as businesses. This roadmap aims to be different from them in that it focuses on CBPR and participation within Science Shops and addresses Science Shop-specific issues such as the involvement of students, fixed time frames of projects, etc. The second aspect where this roadmap aims to update the practices incorporated in previous guides and toolkits is the inclusion of online engagement methods.

The roadmap provides a simple step-by-step guide to the CBPR. It guides through WHAT are the key steps to run projects at Science Shops, WHY a given step important, and WHAT FACTORS have to be taken into consideration. The HOW to implement the step is touched upon only briefly, as it is covered in existing guides and other sources that we present in links and the toolkit.

Several toolkits are directly integrated into the roadmap steps, which include links to concrete tools to support the implementation of the respective step. Additionally, Chapter 4 "Supporting resources for CBPR and Public Engagement" presents information and links on general sources of information and toolkits that discuss CBPR and PE in general or apply to all steps of the projects.

The roadmap and toolkit is addressed to practitioners from Science Shops: first of all to new Science Shop coordinators, also to more experienced coordinators who are seeking to improve or want to reflect on Science Shops projects and approaches. It could also be useful to students, interns or their supervisors, who take part in the implementation of Science Shop projects.

The roadmap and toolkits continue the work started by other deliverables within the SciShops.eu project to support the establishment of new Science Shops. The deliverable 4.1. "Science Shops Scenarios collection" provided information on establishing and running a Science Shop in institutional terms, without touching upon the project implementation. This deliverable is meant to guide through project implementation at Science Shops. The roadmap is adapted to the previously developed scenarios in the sense that it can be applied to all types of organisational models analysed in the scenario collection, takes into account the options of implementation staff and other aspects, and addresses the online presence of Science Shops discussed in the scenarios collection. The rest of deliverables in the Work package 4 will contain modules for training science shops' staff, Science Shops

establishment guides, and strategy for participatory research in communities and capacity building of existing science shops.

The Role of Public Engagement in Science Shops

The rapid progress and changing landscape in many areas of science and technology have increased society's concern and contributed to ambivalence about the role that research plays in society (Eurobarometer, 2010). To answer these concerns, in 2014, the then Science and Technology Advisory Council of the President of the European Commission published a policy paper (European Commission, 2014) on the relation between science and society in which it concluded that a new '*Science and society contract'* is needed in which "*social learning and co-production of knowledge where appropriate together with the involvement of civil society in science and technology are […] relevant factors to address*". More recently, the current European Commissioner for Research & Innovation, Carlos Moedas stated (European Commission 2015) that "*We must engage all of society in research and innovation processes.*"

Science Shops are one model of the public engagement with research and innovation practices. By answering to community organisations' requests, they deal with at least one part – the civil sector – of the society. However, in practice, Science Shop projects might include different degrees of participation, as well as involve a different range of stakeholders and publics. As stated in the introduction, this roadmap aims to encourage the participatory dimension of Science Shops. Thus, this part reviews the concept and degrees of public engagement, discusses reasons behind stakeholder and public engagement, gives an overview of the types of stakeholders that Science Shops can deal with, and gives a short review of the changing methods in public engagement.

What does it mean to engage?

There are many definitions of public and stakeholder engagement. Nevertheless, all of them emphasise that it includes many different ways in which the general public or stakeholders (individuals, groups, and/or organisations) are involved in various activities (research, decision making, etc.) that affect them, whether passively via consultation or actively via two-way engagement with the goal of generating mutual benefit (Reed at all 2018, The National Co-ordinating Centre for Public Engagement; Toolkit on Public engagement with science).

Public and stakeholder engagement can take many different forms. One of the common ways to understand this diversity is to classify engagement activities by the intensity of participation. This guiding framework is presented in Table 1.

Table 1. The different intensities of engagement. Based on Jellema and Mulder (2016) and IAP2 Spectrum of Public Participation (cited in Gordon 2016).

Engagement Categories	**Discussing**	**Consulting**	**Involving**	**Collaborating**	**Supporting**	**Empowering**
Definition	Sharing information about research & innovation and opening up channels for discussion and interactive communication.	Requesting visions on research and innovation processes, and facilitating contributions and structured discussions.	Creating opportunities for contributions to deliberations and research activities or contributing to research execution as more than a subject in the project.	Working together on research initiation and/or execution, so there is co-ownership of the project.	Societal actors are in the lead in the research initiation and most of the execution. They are supported by researchers or institutions.	The whole process is lead by direct decision of the non-experts. At times the researchers can be consulted, but not mandatory.

The different types of engagement indicated in the table demonstrate different roles of the civil society and different degrees of engagement. The initiative from the civil society increases from left to the right, while the highest level of stakeholder and public engagement is found in collaboration efforts; in all other forms, the interaction between researchers and civil society is less pronounced. This and similar "ladder" models sometimes are used to emphasise that "more participation is better". However, it should not automatically mean that one or another type of engagement is superior. Instead, it shows the various possibilities of engagement that can be better suitable for different situations.

This framework provides an overview of different processes that Science Shops can facilitate with civil society. Projects implemented by Science Shops can range from minimum to maximum degrees of participation. At one end, there are "contractual" projects (Shirk et al. 2012), where communities ask professional researchers to conduct a specific scientific investigation and report on the results, but do not participate in project definition or implementation. In this framework they would not even qualify as community based participatory research. At the other end would be collaborative (or co-created) projects, where stakeholders or citizen are co-owners of the projects. Real-life examples of Science Shop projects show a variety of degrees of participation with the same projects involving several categories (see Table 2 for a couple of examples).

Table 2. Real-life examples of Science Shops projects with different degrees of participation (from Stanescu et al. 2018).

Project name and institution	Project goal	Methods	Impact
Science Shop Language, Culture and Communication at the University of Groningen, "Cultural transfer in and through reading groups"	Improving tools to support successful cultural transfer in reading groups.	● presentations to partners and the public; ● symposium with discussions to generate ideas.	discuss consult
The Science Shop at the Environmental Social Science Research Group, "Forgotten citizens of Europe: Participatory Action Research for Local Human Rights"	Exploring local human rights problems and the experiences of the Roma communities in Szeged in Southern Hungary.	● semi-structured interviews; ● forum to discuss results from interviews; ● second forum to select one or two projects that would be realised together.	discuss consult collaborate

The examples in the table illustrate one more point on the process of public engagement – its **non-linearity**. One project can simultaneously aim at different levels of public engagement – from discussion of the project's results to the members of the community organisation taking part in data collection (cf. Gordon 2016). This idea is presented in Figure 2.

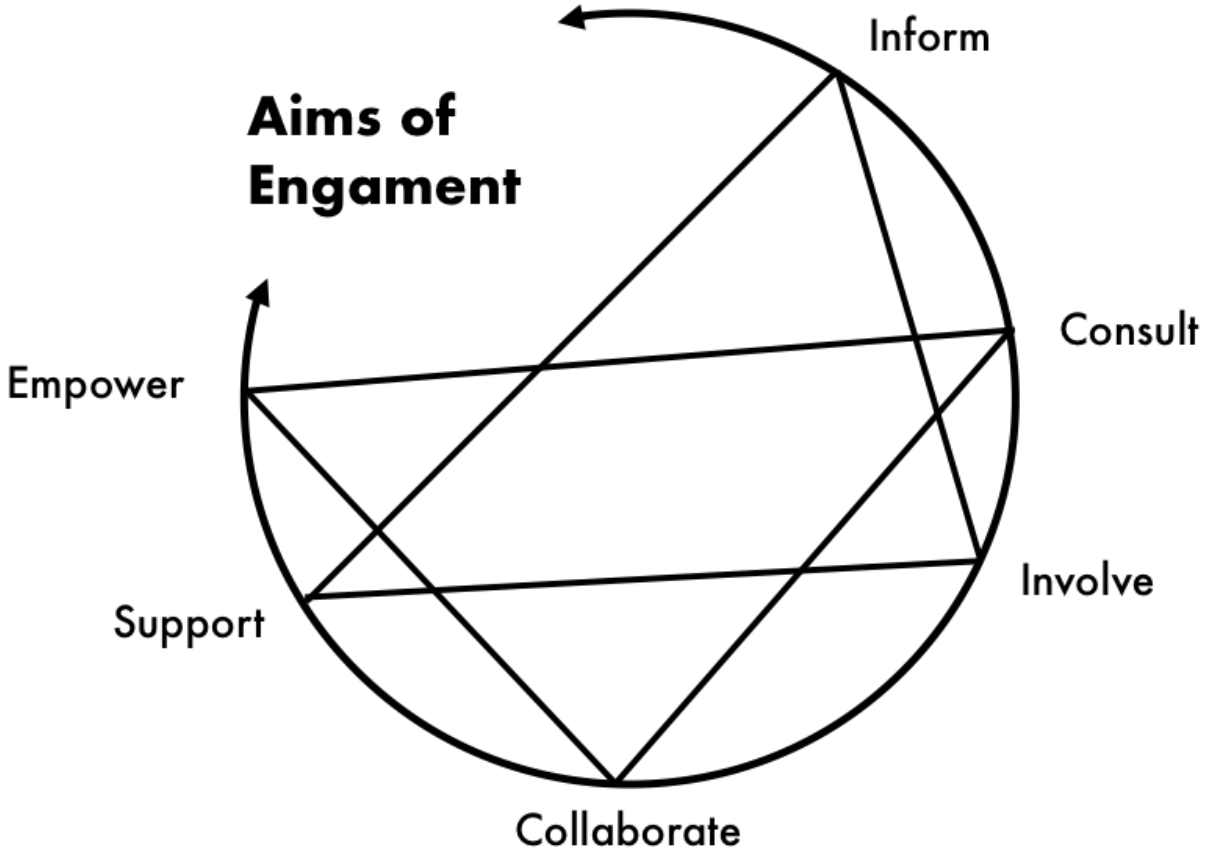

Figure 2. Non-linearity of public engagement process (based on Gordon 2016).

Moreover, public engagement is "an iterative process in which an organisation learns and improves its ability to perform meaningful stakeholder engagement while developing relationships of mutual respect", and "lessons from past' experience will then shape future planning and engagement" (Jeffery 2009). Knowing this, Science Shops can use different public engagement strategies by performing one or combining several levels of public engagement and learn from their previous experience.

Some internal and external factors may create **obstacles for performing public engagement** in Science Shops activities. Internal factors mainly rest on Science Shop coordination and implementation staff' competences and experience of doing public engagement. External factors are more strongly related to culture of participation in society. As Reed and co-authors state, "stakeholder and public engagement may not be appropriate where there have been unsuccessful previous attempts, are insufficient resources, or is no culture of participation" (Reed et al. 2018). Having this in mind, Science Shops can create public engagement strategies that bypass the obstacles and engage their stakeholders and general public in the most beneficial way.

Why engage?

The roadmap is intended to show the vital steps in projects run by Science Shops. However, by asking "how" the stakeholder and public engagement works, we should not forget "why" we should engage at all, as it will guide the whole process.

There are, of course, many reasons behind public engagement in Science Shops. But it is useful to expound them since well-motivated and high degrees in engagement in Science Shops is a key to their

success. Below, these reasons are examined from two perspectives: Science Shops themselves (why they would want to involve stakeholders and public) and society (why it is important for the society at large and individual citizens).

From a Science Shop's perspective, intentions behind public and stakeholder engagement in Science Shops can be founded upon several lines of argumentation. From a normative view, engagement is seen as 'a right thing to do'. Commitment to engagement rests on a commitment to empower citizens and is seen as a good thing in its own right without need for further justification. This view rests on a democratic political worldview that encourages participation in general (Datta 2011).

However, participation should not be an end in itself – a point that will be touched upon again when discussing the process of engagement. From a pragmatic perspective, engagement is seen as a better way to achieve things. It helps to collect more knowledge, experience and expertise in addressing the complex nature of any kind of issues and problems. It is claimed that participatory approaches have the capacity to "reduce conflict, build trust, and facilitate learning among stakeholders and publics, who are then more likely to support project goals and implement decisions in the long term" (Reed et al. 2018). Thus engagement is considered to improve quality of research by providing new insights and perspectives and to increase the likelihood of research impact.

In more general terms, participatory processes in science address such problems as a lack of trust in science and experts. By running Science Shops, research institutions and other host organisations demonstrate their commitment to responding to society's concerns and participation in solving societal problems. For publicly funding research institutions, it is also a matter of accountability (The National Co-ordinating Centre for Public Engagement). Science Shops are a form of public engagement as such, and by making their approaches even more participatory, they can add more to transparency and trustworthiness of science.

From society's perspective, engagement allows diverse groups to raise concerns of relevance to them, which might otherwise be overlooked (Datta 2011). It also builds capacity in public by creating networks and performing educational function (Slocum 2003).

For individual citizens, participation in public engagement means the ability to contribute to shaping one's environment, which might be related to political engagement or a need to self-expression. Furthermore, there is an educational function (Kelty et al. 2015), which applies to learners of all ages and from all walks of life with an interest in gaining knowledge of a particular area. Also, participation might be motivated by the possibility to share affective bonds with fellow citizens or community members without a need of further practical or instrumental reasons.

In sum, effective and meaningful stakeholder and public engagement:

- is an expression of a democratic way of thinking;
- encourages development of new ideas, ways of thinking and innovative outcomes;
- increases relevance, sustainability and broader understanding of related issues;
- helps to build trust between different stakeholders;
- increases the likelihood of research impact;
- reaffirms commitment to wider social benefit, to dialogue and to mutuality;
- strengthens sense of ownership, commitment and responsibility of involved stakeholders;
- helps to match the work to the expectations of wider society;
- adds to openness, transparency and accountability.

Whom to engage?

All Science Shops' projects engage different stakeholders and sometimes publics. In general, stakeholders are defined as those who are affected or can affect a decision on the issue(s) that the project deals with. Publics are groups of people who are not affected by the issue(s) that the project deals with but who engage with the issues through discussions or otherwise (Reed at all, 2018).

Science Shops may consider working with many types of organisations during the project implementation. The following diagram (Figure 3) illustrates some of the potential organisations that Science Shops can work with, representing three sectors of society (public, civil and business sectors), as well as the general public.

Figure 3. Example of a university's stakeholders. Source: The National Co-ordinating Centre for Public Engagement (NCCPE) website, https://www.publicengagement.ac.uk/about-engagement/who-are-public

Civil society sector

Science Shops mostly work with civil society organisations – communities and NGOs – as "client organisations", which submit requests for a research or other type of project. However, other civil society organisations can be involved too as separate stakeholders in Science Shops' research and engagement projects, especially if they are of high relevance to the project issue: for example, are useful for better understanding the issue; can help with interpreting research data; can provide contacts to their partners (contacts with policy makers are particularly of high importance); can take part in the implementation of co-created recommendations, tools and other results of projects.

Wageningen University & Research Science Shop implemented a project "Involvement of gardeners and neighbourhood at the De Koekelt complex in Ede". The aim of the project was to propose a plan for reconstructing an allotment complex in Ede, Netherlands, into a multifunctional neighbourhood park. The project was undertaken in response to a request from the Ede association of amateur gardeners (VAT-Ede). The project looked into the viability of turning a private allotment complex into a multifunctional garden park, which would both reflect the needs and wishes of the gardeners and the local community. The research was conducted by a group of students. Research methods included a literature review and discussions of researchers with all relevant people and organisations. Besides the gardeners of De Koekelt, these were representatives of a national umbrella organisation of gardeners, a policy officer from a respective ministry, landscape architects, other users of the current allotment complex, and other organisations active in the area. The findings helped to create a design for the new garden park (Kruit et al. 2009).

Business sector

For-profit businesses also can be Science Shops clients if they have a question with a wider societal relevance and agree to publish the results openly. Nevertheless, businesses more frequently are engaged in Science Shops projects as stakeholders that can discuss, support and sometimes help to implement project results.

The Bonn Science Shop in the project "Green instead of Gray – Industrial Parks in Transition" (https://www.wilabonn.de/projekte/786-gewerbegebiete.html) was working on the greening and long-term sustainable development of industrial parks. The project included consultation and involvement of a wide range of stakeholders, such as experts, businesses, government and citizens and looked at aspects including the design of parking spaces, the use of building materials and planting of vegetation. Three pilot cities, Frankfurt (Main), Marl and Remscheid serve as best-practice models for further developments in other business parks. Ref Deliverable 2.2 (Garrison 2018)

Public sector

Policy makers and other public agencies sometimes also provide research questions for Science Shops, but more frequently they are involved as outside stakeholders who have influence on the project issue and implementation of the project's recommendations. They can also provide access to organisational or financial support. Thus, engagement of policy makers increases the possibility of making a bigger impact in terms of project outcomes at local and even national levels.

The Science Shop run by the Environmental Social Science Research Group (Hungary) in its project "Forgotten citizens of Europe: Participatory Action Research for Local Human Rights" was aimed at exploring local human rights issues and the experiences of the Roma communities in Southern Hungary. Alongside participatory research, a network of local stakeholders, professionals, activists, schools, and municipality was established and engaged in the project. The engagement of the municipality was of crucial importance to the implementation of the final result of the project – to establish an alternative school for Roma children in the local community. Ref Deliverable 2.5 (Stanescu et al. 2018).

General publics

General publics are less frequently involved in Science Shop projects, although it does not have to be an exception by definition. It is more likely in non-university based Science Shops that perform a wider range of project types (see deliverable 4.1.), while at universities, Science Shop projects tend to be research oriented, of smaller scale and duration, and implemented by students, and therefore less suitable to engage general publics.

> The Living Lab for Health (Spain) carries out projects for health promotion and transformative change of the R&I system that are co-developed with different stakeholders, including the scientific and education communities, policy makers, business and industry, civil society organisations and citizens in general. These projects include educational programmes and participatory programmes related to research and innovation (R&I) and governance, and they are carried out with and for the community. One of these projects, "Xplore Health", is part of a European educational programme to promote health by facilitating decision making based on scientific reasoning. The educational programme is structured in eight thematic modules and is offered online and through a network of pilot educational centres, research centres and science museums located in different parts of Spain (Garrison et al. 2018).

How are modes of engagement changing?

The SciShops project deliverable on Science Shop scenarios (Schroyens et al. 2018) identified that the online presence of Science Shops is bound to play an ever-greater role, with real life examples of Science Shops trying to function almost entirely online. The question for this study is how online tools can be used for implementing Science Shop projects and public engagement activities.

While social research on the internet with online surveys, interviews and focus groups can be regarded as a customary activity, online public engagement activities are a newer trend. The internet provides many options for online public engagement activities (for more on specific tools refer to the section "Step 3: Select the right tools" under the "Engagement activities development and implementations"), when researchers can use existing virtual communities or initiate new communities and connect to individuals who would otherwise be isolated (Tamí-Maury et al. 2017). The main advantages of the online channel are accessibility and its potential to reach diverse groups without geographical or temporal limits; the main disadvantages are the loss of interaction quality and the continuity of dialogue (lesser participant commitment) compared to the offline scenario (Lopez & Olvera-Lobo 2018; Tamí-Maury et al. 2017). Therefore, an effective public engagement might need a combination of online and offline strategies (Lopez & Olvera-Lobo 2018).

The newest and most documented development in public engagement activities is online citizen science (or 'mass' or 'crowdsourced collaboration' in research) (Salganik 2018). Although it has only emerged in recent years, there is already a wealth of experience of projects to draw upon to learn about how to engage publics. The experience of participation in various forms of online citizen projects already extends to millions of people. They have contributed to projects like protein folding (https://fold.it/portal/), bird watching (https://ebird.org/home) and many more. Perhaps the most well-known project started in astronomy with Galaxy Zoo which has now become a raft of many different projects ranging from sciences to the humanities with Zooniverse (https://www.zooniverse.org/).

Among the lessons here is that there tends to be a core of frequent contributors while a large proportion only contribute occasionally. This unevenness is not necessarily a problem (if, say, 20% of participants make 80% of the contributions and vice versa), but it is a factor to consider if the aim is to get as wide and equal contribution as possible.

Another aspect to consider is that in these projects, one of the motivations is that participants will, together with researchers, become authors of papers. A scarcity of recognition of intellectual contributions of non-academic collaborators in research articles has been highlighted as a problematic aspect of participatory science (SarnaWojcicki et al. 2017), but it has sometimes been overcome in these online projects (such as Galaxy Zoo and eBird), which have many publications that are jointly authored by researchers and 'lay' publics.

Scaling up online citizen science requires organisation: there may be a need for moderators of groups, for trainers, and for ensuring that participants are informed, given help, and well organised to work together (since, as with any large-scale groups, there are bound to be conflicts within groups and mischief-makers). Still, it has been shown that very large-scale and consistent and growing participation can work well and, despite problems, produce high quality work on unprecedented scales, perhaps most notably in the case of Wikipedia (Reagle 2008).

It can also be noted that some of the projects are at the cutting edge in terms of what can be done when networked people and machines work together: the Galaxy Zoo project and some classifications of political texts (see Salganik 2018) are such that volunteers in these projects are used for what machines cannot do easily (classify astronomical objects or texts). But these classifications by humans are then used to train machines (machine learning) in the process of how this is done, which can then be used to automate the process of how to produce knowledge and apply this process to larger datasets or domains. This type of project may currently seem far removed from the local, face-to-face, non-technological forms of engagement that have characterised Science Shops in the past. But they are likely to become increasingly common in the future as science and knowledge take the form of these new, machine learning-driven, approaches.

2. Roadmap and Toolkit for Science Shop Projects

The roadmap provides an understandable, approachable and straightforward step-by-step guide for implementing projects in Science Shops. It also includes different resources and tools to support the implementation in each step. As discussed in the introductory chapters, any Science Shop project revolves around fundamental concepts such as discussing, consulting, involving, collaborating, supporting and empowering different stakeholders. Open communication and expectation management is required in all the phases. It is important to meet regularly with the key stakeholders to discuss progress and unexpected challenges and to ensure that the project is being implemented. The roadmap (Figure 4) provides the "how to" steps to implement these key concepts.

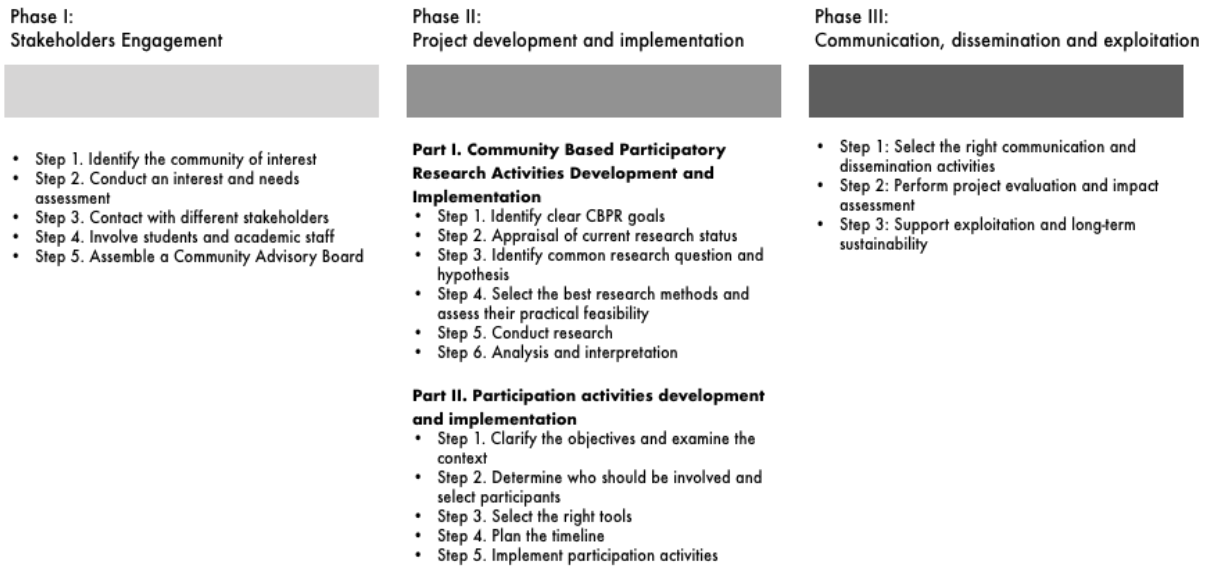

Figure 4. Overview of the Science Shops Practitioner roadmap with respective phases and main steps. Based on Hacker, 2013

The roadmap applies to all kind of organisational models of science shops – university, NPO or company-based, as the process of community based participatory research does not differ in any fundamental way depending on the organisation that runs a project. Some differences might lie in such questions as to who implements the research or how it is funded, but these were covered in the Deliverable 4.1 “Science Shops Scenarios Collection”. Of course, also the process of running CBPR projects might need some adjustments depending on established processes in the organisation, its organisational culture and available resources. Therefore, an organisation using this roadmap has to look at it as a general outline on CBPR and make the needed adjustments on its way.

Science shops through the whole process of implementing the projects need to take into consideration the RRI dimensions: public engagement, gender equality, science education, open access, ethics, and governance, for example, consider gender balance of project participants, ensure research ethics, etc. The roadmap especially highlights one dimension of RRI – public engagement, in that it emphasises participatory element of community based participatory research and includes a part of roadmap on how to engage with stakeholders and the public. Within the SciShops project, a general toolkit covering all dimensions of RRI was presented in the Deliverable 2.2 “Existing RRI tools and successful participatory community-based research case studies report” (Garrison et al. 2018) and is not replicated here.

Phase I. Stakeholders Engagement

Step 1. Identify the community of interest

Before the implementation of concrete projects, it is important to do some preliminary work. Firstly, a pool of community/ not for-profit organisations must be identified, which have research or other activity requests which the Science Shop can work on. Depending on the country context, the Science Shop's reputation and other factors, some or a lot of attempts must be taken by newly established Science Shops to engage and empower all of these organisations to provide research and other activity requests. The Living Knowledge Network provides an example of a survey to explore the interests of Civil Society Organizations: http://www.livingknowledge.org/fileadmin/Dateien-Living-Knowledge/Dokumente_Dateien/Toolbox/LK_D_Questionnaire_needssurvey2002_2003.pdf

Step 2. Conduct an interest and needs assessment

A big challenge relating to the implementation of a project is whether the different stakeholders share a common interest. It is important that stakeholders get to know each other and learn about their common interests and needs. A community needs assessment is also a good tool to evaluate the potential demand for Science Shop projects or explore if new project ideas have enough support from the community side. The Community Tool Box provides a guideo how to develop a plan for community assessment: https://ctb.ku.edu/en/table-of-contents/assessment/assessing-community-needs-and-resources/develop-a-plan/main

Step 3. Contact with different stakeholders

After receiving a research or other Science Shop activity request, the next step of a Science Shop isto get in contact with the organisation that submitted the request in order to clarify the request.

Also, it is useful to contact other relevant stakeholders to gain a broader understanding of the issue and check the possibilities of involving stakeholders or partners in the project implementation. A stakeholder can be a person (or group) that is responsible for making or implementing the Science Shop project, that will be affected by the project, or that can aid or prevent its implementation.

A useful tool to identify who should be involved in CBPR project is stakeholder analysis. It helps to make a list of stakeholders, to describe their needs or desires with respect to the project, and to determine how much interest in and influence over the project outcomes they have. Understanding the needs and concerns of the stakeholders helps managing their expectations and constructively involving them in contributing to the project outcome. One common tool for stakeholder analysis is to analyse them according to their interest and power. Here there is a concise description of such analysis and a list of potential stakeholders for projects: https://www.odi.org/publications/5257-stakeholder-analysis.

Several toolkits provide guidance on running activities to involve and engage stakeholders in Science Shop projects: The website Gamestorming (www.gamestorming.com) provides a series of activities for onboarding (opening), for developing ideas, vision, strategies, for problem-solving, planning, decision making and for review meetings.

Step 4. Involve students and academic staff

Many Science Shop projects rely on students and academic staff to conduct the research and other activities such as public engagement events. There are several challenges (e.g.: lack of experience, conflicting timescales and availability, for additional information see Deliverable 4.1 Section 2.5

Implementation staff (Schroyens et al. 2018)) on how to involve both students and staff in these type of projects.

However, it is important that students participate in learning experiences that prepare them to develop mutually beneficial partnerships with potential community research partners. Students will benefit from discussions with experienced community researchers who fully embrace CBPR principles and those who have experience of the personal and institutional challenges often associated with this form of research.

The University of Illinois at Chicago (US) provides some simple tips on how to involve students and faculty in CBPR projects: https://oceanhp.webhost.uic.edu/wp-content/uploads/2015/01/Involving-Students-in-CBPR.pdf The Living Knowledge community also provides detailed information on how to involve students and academic staff in a CBPR project, including: http://www.livingknowledge.org/resources/toolbox/#c1000

Step 5. Assemble a Community Advisory Board

If possible, a Community Advisory Board (CAB) should be established for the project. The CAB will support the development and approval of the project goals and respective research question. It is important that the CAB members are committed and represent the community (or have strong connections with it). CAB members need to meet regularly throughout the project. The Alliance for Research in Chicagoland Communities (US) has detailed guidelines for forming, supporting CABs for CBPR: http://arccresources.net/wp-content/uploads/2014/09/Forming.Supporting-Community-Advisory-Board-CAB1.pdf

Phase II. Project development and implementation

As mentioned, this roadmap is intended to encourage the participatory dimension of Science Shop projects. Therefore, this section of the roadmap is divided into two parts: “Community based participatory research activities development and Implementation” and “Participation activities development and implementation”. The two parts do not exclude each other, but can be used simultaneously in the same project.

Part I. Community Based Participatory Research Activities Development and Implementation

This section provides some essential steps, with accompanying guides and references on how to implement community based community based participatory research (CBPR) projects in the context of Science Shops. This section is based on two excellent reference guides on Community Based Research and Research Methods: Community-Based Participatory Research Paperback (Hacker, 2013) and *Doing Real Research: A Practical Guide to Social Research* (Laurie & Jansen, 2016).

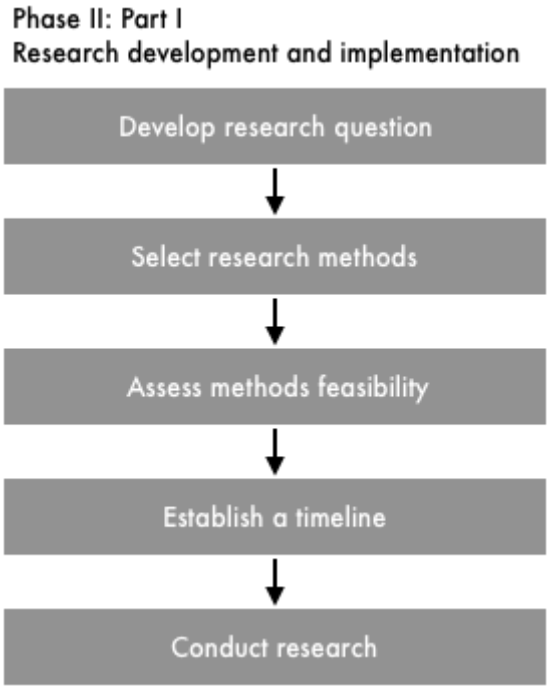

Figure 5. Main steps of Part 1: Research development and implementation. Source: Laurie & Jansen, 2016

Step 1. Identify clear CBPR goals

A first formulation of the goals of the CBPR project should be agreed among stakeholders at the beginning of the process to provide a common sense of direction for the overall CBPR project. The CAB (see Phase I Step 5) can support the development of these goals and several resources are available that provide guidance on how to develop clear CBPR goals: the following toolkit outlines the different aspects of a structured conversation with different stakeholders, which will lead to concrete CBPR goals: http://actioncatalogue.eu/method/7423

Step 2. Appraisal of current research status

As soon as the CBPR goals are agreed upon, it is important to assess existing research in the relevant area(s) of the project, for example through a literature review. At this stage, key terminology and concepts should also be clarified to agree a common understanding and reduce ambiguity. This step can be done as a University assignment of "literature review". The University of South Carolina Library (USA) provides advice on how to develop and organise a literature review: http://libguides.usc.edu/writingguide/literaturereview

The literature review needs to be shared with the relevant stakeholders, especially the CAB. It is important that they are informed about current knowledge on the subject, as this will be essential for the next steps.

Step 3. Identify common research question and hypothesis

The community members are crucial to the identification of the project question, but many may not have the skills or knowledge to refine and focus the research question. The research question will be based on both the topic of interest to the stakeholders and the research team, and it is the foundation of all the components of this Part I. It defines how data will be collected and how data will be analysed.

It is well known that taking a community concern and turning it into a research question and hypothesis is challenging. I Questions often stem from broad and timely community concerns: "How do we stop child obesity?" or "How do we improve rubbish collection?" The data collected in the previous steps (Step 1) is essential for gaining an in-depth understanding of the topic and developing a clear research question and joint hypothesis. Table 3 provides some examples of how research questions have been developed for several CBPR projects.

Table 3. Examples of questions from the community, joint research questions and resulting joint hypotheses. Source Hacker, 2013

Topic	**Community Question**	**Research Question**	**Joint Hypothesis**
Children Obesity	How can we stop child obesity?	What are the factors that are related to child obesity?	Children have been consuming more sugar-based food and exercising less than a decade ago.
Waste Management	How can we improve rubish collection in our community?	What are the current challenges relating to waste collection in the community?	Waste collection routes are not optimised for current waste production.
Cultural Heritage	What is the common heritage of a region?	What is the existing evidence of cultural heritage in the region?	Pottery provides evidence for a certain cultural heritage.

Tabe 4 gives an overview of different guiding principles for the research question. It is important to remember that CBPR is not only about research itself, but also about resulting actions at the community level, so both the question and joint hypothesis need to lead to actionable outcomes. The University of South Arizona (USA) provides some guidelines on how to write a good research question: https://cirt.gcu.edu/research/developmentresources/tutorials/question

Table 4. Principles to guide CBPR question development

Target the community needs.	Aim your research question at specific needs from the community that you are working with.
Keep it narrow and specific.	The question must be answerable.
Be analytical.	The question should be more than a simple description in order to contribute to the community.
Be clear and brief.	Maintain maximum clarity by ensuring your research question is simple and easy to understand.

Step 4. Select the best research methods and assess their practical feasibility

Once the research question is defined and the hypothesis identified, it is time to match the methods to the question(s). This step should include a detailed research proposal, including rationale, objectives, research question, hypothesis methods, time frame, population and partners.

The methods used in CBPR should address the question of interest and meet the standards of rigour used in scientific research. However, when working in CBPR, find a compromise between the community needs and ambitions with the necessary research standards. The community context is changeable and requires versatility not typically seen in conventional research. Therefore, decisions about methods should be made together. The acceptability of those methods – that is, whether the community considers methods appropriate for its context – must also be assessed. Also, only the communities can determine if the methods are practical and feasible in the respective communities.

Thus, determining the best research methods for the project often requires a compromise between the researcher, who possesses knowledge of scientific methodology and its design and methods, and the community members, who possess knowledge of the community context and what is possible for political and practical reasons. With the help of community partners, new and more applicable methods may be identified (e.g.: Citizen Science, see Citizen Science Box) that provide more appropriate strategies for collecting and generating knowledge than those from academia. It is important to also present the community with more traditional research concepts, which can help community partners understand the rationale for specific methods, with higher research rigour, and what conclusions may be drawn based on the chosen methodologies. Several research methods can be used: ranging from surveys; qualitative focus groups and interviews (see Text box 1); to more complex approaches like Citizen Science (see Text box 3); or randomised controlled trials (see Text box 2).
Surveys and interviews are much more common on CBPR studies, while Randomized controlled trials (see text box) are less common, which in a way greatly limits the extent to which CBPR can establish causal validity. However some CBPR have been experiencing with Citizen Science approaches (see Textbox 1), which include some innovative approaches of involving citizens in collecting and analysing research data.

TEXTBOX 1: **Qualitative Research Methods**

Some of the most popular CBPR methods include qualitative methods such as focus groups and interviews and quantitative methods such as data review and surveys. These methods have the advantage of being easily adapted to a participatory approach. With training, community partners can be involved in conducting observations, taking notes, facilitating focus groups, or developing and conducting surveys. They can also be involved in the recruitment of participants for any of these activities. Each of these methods also has potential utility for their future work, thus building important community capacity. For example, community partners may utilize surveys as part of community needs assessment and evaluation activities. Shallwani & Mohammed (Shallwani & Mohammed, 2007) provide a detailed overview on how to implement non-experimental methods in their Training Manual for Community-Based Researchers (http://www.livingknowledge.org/fileadmin/Dateien-Living-Knowledge/Dokumente_Dateien/Toolbox/LK_A_Training_manual.pdf)

TEXTBOX 2: **Randomised controlled trial**

A randomised controlled trial requires at least one group that receives a specific intervention, and a control or comparison group that doesn't receive. Participants are randomly assigned to the different groups. It can help to decrease sampling bias, which is the "*over or underrepresentation of some population characteristics in a sample due to the method used to select the sample.*" (Chomitz, 2011). This type of experimental design is often not possible in community settings due to the nature of the research question or even access to the communities. In addition, the need for highly controlled methods may not be readily accepted by community partners or, in some cases, not event necessary to answer the question under study. The book Randomized Controlled Trials: The Basics (Blackwell Publishing, 2008) provides the basic information on how to implement RCT research: http://www.blackwellpublishing.com/content/BPL_Images/Content_store/Sample_Chapter/9781405132664/9781405132664_4_001.pdf

TEXTBOX 3: Citizen Science

Citizen science is defined[1] as "*scientific work undertaken by members of the general public, often in collaboration with or under the direction of professional scientists and scientific institutions*". A citizen scientist is defined as *"a scientist whose work is characterised by a sense of responsibility to serve the best interests of the wider community*"; or "*a member of the general public who engages in scientific work, often in collaboration with or under the direction of professional scientists and scientific institutions; an amateur scientist*". Due to the community participation nature of CBPR projects, citizen science methodologies are appropriate for the implementation of some CBPR. Below you can find some relevant references for conducting citizen science projects (From Garison et al. 2018):

- How to run a citizen science project: The Engage catalogue contains an overview on citizen science http://actioncatalogue.eu/method/7431 and examples of projects;
- A blog on How responsible is citizen science? https://ecsa.citizen-science.net/blog/how-responsible-citizen-science explains how adopting citizen science methodologies can help align research with RRI principles;
- A collection of citizen science guidelines and publications http://ecsa.citizen-science.net/blog/collection-citizen-science-guidelines-and-publications produced by the "Doing It Together Science" (DITOs) project highlights guidelines and scientific publications on citizen science, particularly highlighting their relevance to aspects of RRI;
- Citizen science for all - A guide for citizen science practitioners https://www.rri-tools.eu/-/citizen-science-for-all-a-guide-for-citizen-science-practitione-1 contains many practical hints, including a checklist. Published by the GEWISS Programme, Germany;

[1] "*Citizen science" added to Oxford English Dictionary*". The Daily Zooniverse. 16 September 2014. Archived from the original on 16 June 2016.

- Citizen Science Toolkit https://www.rri-tools.eu/-/citizen_science_tools is a compilation of resources and ideas for the development of citizen science projects produced by the Cornell Lab of Ornithology;
- Citizen science at universities: trends, guidelines and recommendations http://www.leru.org/index.php/public/news/citizen-science-at-universities-trends-guidelines-and-recommendations/ includes guidelines for scientists engaging in citizen science, recommendations for institutions and examples of citizen science initiatives. The report is produced by the League of European Research Universities.

Step 5. Conduct Research

Like any other project, implementing the research is mostly dependent on preparation – that is, how well the roles and responsibilities (Textbox 4) were defined and how well procedures were outlined (Figure 5). In some cases, training is necessary to ensure accurate and complete data collection by community members or students. The CAB should take responsibility for monitoring progress toward goals and deal with unexpected events or situations that arise during the implementation, for example, due to staff changes or incomplete data.

TEXTBOX 4: Roles and responsibilities

It is important to have some agreements in place between the stakeholders of the project. Below is a list of components to take in consideration when setting up an agreement between partners:

- Partners description;
- CBPR timeline, including starting and ending dates;
- Roles and responsibilities (who will do what);
- Scope of work;
- Deliverables (when and what is expected from each partner);
- Budget;
- Publication rights, authorship and data ownership.

The researchers will act as the principal investigator and have the responsibility of conducting research responsibly and according to institutional standards, including approval processes. But the researcher needs to share the decision making processes with the rest of the community, and disputes that arise while conducting research will need to be collaboratively resolved. However, there are many ways to involve the community in conducting research, e.g.: their involvement in data collection through citizen cience approaches can build their skills and motivation.

Step 6. Analysis and Interpretation

Determine who will be involved in the analysis of the data and interpretation. For analysing quantitative data, using statistical methods, it is often best left to the academic team, who are familiar with the specific statistical software. However, there may be community members who want to learn or develop some specific skills (e.g.: in simple data analysis). For data analysis, several introductory courses can provide necessary skills to students and community members in data analysis: Intro to Data Analysis by Udacity: https://eu.udacity.com/course/intro-to-data-analysis--ud170 or a complete overview of Data Analysis courses provided by David Venturi: https://medium.freecodecamp.org/i-ranked-all-the-best-data-science-intro-courses-based-on-thousands-of-data-points-db5dc7e3eb8e

For qualitative data, several methods can be used and the Amsterdam Public Health consortium provides several general principles in qualitative data analysis and good practices: http://www.emgo.nl/kc/qual-data-analysis/

Please note that data and results ownership is something that should be agreed, as data and own analyses are not only property of the researcher but also of the other stakeholders. Data and results should also be published following open standards, namely the Open Science guidelines of the European Commission (2017).

The researcher team conducting the analysis should present early results as soon as possible, before doing a more extensive analysis. In this way, stakeholders can assign first meaning to the preliminary results and help the rest of the stakeholders to guide the analysis and interpretation. The initial interpretation is one of the most important and valuable contributions of the community to the CBPR Project. The community partners will have an understanding of the context and meaning of these data, and their insights may be very different from the researchers. The data analysis needs to be an iterative process and should incorporate the multiple perspectives. The CAB will be instrumental in interpreting results of any CBPR project as members bring their understanding of the community issues to the process.

Part II. Participation activities development and implementation

Participation is an essential component of CBPR projects. As described in the Phase I "Stakeholders engagement", CBPR projects should at minimum involve the community organisation that provided the research request. Besides the "project community", i.e.: coordinators, researchers, students, community organisations and other stakeholders included into the Community Advisory Board, Science Shop projects might involve other stakeholders and publics. Their participation is important to increase the project's impact, e.g. by involving other relevant stakeholders, who might influence exploitation of project's results; by collecting more diverse ideas on the issue the project deals with; or by involving publics whose knowledge, attitudes or behaviour are important for a wider impact in the society.

This section presents steps with links to additional resources for planning and implementing participation activities within CBPR and other Science Shop projects that result in products or services for community organisations, or include educational activities. It can be used for two purposes: firstly, to plan participation activities with external stakeholders and publics (not belonging to the project community engaged in the Phase I); secondly, to plan more structured ways to engage with stakeholders that belong to the project community.

The section is based on guides and toolkits on public engagement in research and government. The two most important from them were the "Toolkit on public engagement with science", prepared by European Union's FP7 project PE2020 (https://toolkit.pe2020.eu/), and "Participatory Methods Toolkit. A practitioner's manual" (2003) by Niki Slocum, prepared for King Baudouin Foundation & Flemish Institute for Science and Technology Assessment.

In 1999, InterMEDIU Science Shop, University of Iasi (Romania) implemented its first project "Evaluation of the quality of drinking water supplied in the city of Iasi". The main objective was to assess the correlation of the water sources quality with the quality of water produced by the regional Water Works Company (WWC), as a response to concerns of the citizens as well as media articles that were suggesting poor water quality. Besides the lab research, the project included a public

consultation in form of a large survey and a large public debate that involved local NGOs, the Environmental Protection Agency, university staff from several faculties, representatives of other Romanian Science Shops, WWC, the Institute of Hygiene, and research institutes. The project provided concrete findings on water quality and helped raising citizens awareness of, and engagement in, solving the environmental problems of their community (Stanescu et al. 2018).

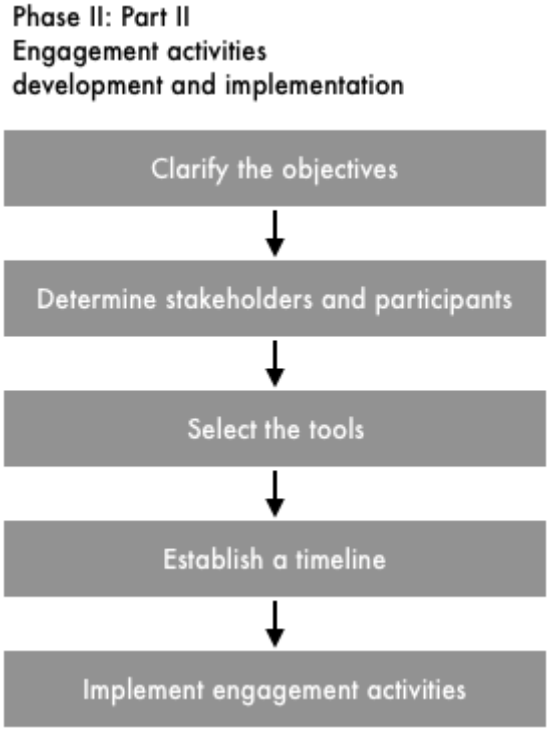

Figure 6. Main steps of Part 2: Engagement activities development and implementation.

Step 1. Clarify the objectives and examine the context

The first thing to do when starting a participation activity is to consider the goals, objectives and the desired impact/outcomes of the activity. The definition of the goal must answer the questions why the involvement is needed and who should be involved. This step is vitally important and must be done carefully, as it will determine selection of methods of involvement, guide all involvement activities, and define criteria for evaluation.

In this step, it should be remembered that stakeholder and public participation is not a goal in itself. In some projects/issues participation of outside actors might be not necessary or not appropriate to reach the goals – definition of goals must bear in mind benefits and limits of participation. Moreover, participation might even bring opposite results, if it is not carefully aligned with project goals and the organisation/project is not able or ready to incorporate public input. PE2020 presents questions that should be asked before deciding whether to undertake public engagement activities: https://toolkit.pe2020.eu/toolkit/section-b-pe-methods-and-tools/b2-designing-pe-initiatives/?rsrc=266-2.

When participation activities are undertaken as a part of research project, it must be considered how they help to reach research goals and fit into the overall research logic, for example, if the stakeholders are involved in order to define research goals, or interpret the collected data and draw conclusions, etc. This will also determine the timing of the activity. PE2020 presents several links to models that help to see how participation activities can be aligned with research cycle:

ttps://toolkit.pe2020.eu/toolkit/section-b-pe-methods-and-tools/b1-types-of-public-engagement-and-connections-with-the-organisational-processes/.

At this stage, it is also necessary to analyse the context in which the initiative will occur. It will help to understand what can be reasonably done and, therefore, influence the definition of goals of participation, as well as further steps. The context includes both internal and external to the project context. Internal context includes the purpose of the project, its geographical scope and focus, legislative context (e.g. needed permissions), the time frame of the project and decision processes, availability of funding and needed expertise, and possibly other considerations related to the project and the institution. In the case of projects implemented by students, the most obvious factor of the internal context is the scope and time frame of the project, as well as student's abilities of facilitation that will determine what participation activities are possible to organise and implement. The external context includes social, cultural, political situation and environment, e.g. the opinion or controversies surrounding the topic in the society, situation of the groups that are studied, culture of participation in the country, etc. (partly based on Slocum 2003).

The aims of the participation activities have to be clearly articulated and agreed upon by the organisers and the advisory committee, if there is such, as it will influence every decision made from that point. As useful tool could be a description on how to organise a group process when defining goals of participation activity, which is presented in a roadmap for PE in government, but is equally adaptable in any other field:

https://engage.livingcities.org/toolkit-builder#step=1.1.

Step 2. Determine who should be involved and select participants

Aims and objectives of engagement should determine who should be involved and the roles of the involved groups. The appropriate stakeholders should include those individuals, groups or organisations which are directly affected by the project outcomes or those who are likely to influence project outcomes, as well as those who could provide a relevant input into the research cycle. For example, in projects that aim to establish new service providers (e.g. school for ethnic minorities), it is essential to involve local governments, in other projects, participation of municipality representatives may be not that useful and it is better not to waste time and attempt to involve them in the project, as usually (of course, it depends on context of the country) they are not easiest partners to involve.

General public can be involved both as passive recipients of project outcomes (new knowledge, tools, etc.), as well as active participants in discussions (e.g. through World cafe activity) to give a fresh view on project issues and relevance of project outcomes.

In thinking who should be involved and why, also limits to participation should be considered, for example, complexity of the issues, as too complex topics might be not appropriate for public discussions. Also, it might be more difficult to involve those who are less articulate and less involved in community affairs.

Definition of who should be involved also has to take into account the geographical scope. On the one hand, the activity could strive a maximum inclusion in the geographical sense, as it affects diversity of opinions and understandings. On the other hand, the planning of this aspect should take into consideration budgetary and logistical challenges, as well as cultural context in the case of a big country. Online engagement activities (e.g. video conferences, online workshops, focus groups, etc.) can help to overcome the physical constraints.

After deciding what groups will be involved in the engagement activity, concrete participants should be selected and recruited. Selection of participants might follow different strategies that, again, depend on the aims of engagement and the context, e.g. random, purposive, open methods of selection. An overview of selection methods and the deciding factors can be found in PE2020 toolkit: https://toolkit.pe2020.eu/toolkit/section-b-pe-methods-and-tools/b3-implementing-pe-initiatives/?rsrc=recruiting-citizens-c3-2.

Step 3. Select the right tools

The next step is the selection of participation methods, or tools of engagement. There are many tools and approaches, ranging from conventional social science methods such as qualitative interviews and focus groups, to more specific tools such as scenario workshop or citizen panels. For example, Action Catalogue (more about it below) includes 57 methods focusing on research driven by involvement and inclusion. However, less of them are actually widely used. Sometime tools have different names but are very similar to each other, differing only in marginal aspects. Better known and more often used methods are focus groups, world cafes, science cafes, co-creation workshops, and some others.

Engagement events may take a less structured form of discussion and not be 'labelled' with a specific method title, which does not make them less valuable. However, structured and tested forms of engagement are beneficial as they helps to ensure that all participants are equally involved and heard.

Decision on which method(s) to employ must take into account at least the following criteria:

- Objectives: reasons for involvement and expected outcomes;
- Topic, e.g. the nature and scope of the issue;
- Contextual situation, e.g. available time;
- The available resources, e.g. funding and available facilitation competencies;
- Nature of participants, e.g. their knowledge on the topic or interest in the issue.

Probably the most comprehensive and useful tool for selecting and learning on participation tools is an interactive online Action Catalogue, developed by the EC-funded Engage2020 project in 2015. The tool is meant to enable researchers, policy-makers and other stakeholders to select the appropriate format for the PE initiatives they wish to develop. The database is searchable on 32 criteria, including objective of application of the method, level of stakeholder/public involvement, geographical scope of application, time needed for the execution of the methods, and many other. Descriptions of each tool include description of the procedure, objective of application of the method, types of engaged actors, specific strengths and weaknesses of the method vis-à-vis the challenge(s) addressed, timeframe for the application of the method, skills required in order to properly apply the method, issues of concern that organisers need to take into account when applying the method, examples of use of the method, and additional information of relevance, as well as references. The catalogue is available at: http://actioncatalogue.eu/.

There are many more useful guides and descriptions of the methods of engagement, here some of them:

- "Participatory Methods Toolkit. A Practitioners Manual", already mentioned before, incorporates in-depth explanations of 13 commonly used participatory methods, each with a description of when to use it, the different steps involved, best practices and budget, hints and tips for putting the methods into action. Available at: http://cris.unu.edu/participatory-methods-toolkit-practitioners-manual

- "Participation Compass" contains a library of tools for participation events and explains why participation is relevant for different communities. It contains methods of participation, case studies of participation in action, resources and guides on participation, and other useful information. Available at: http://participationcompass.org
- "Participaedia" presents a large collection of methods of participation, including less known experimental methods, each with a description of method's history, participant selection, procedure of deliberation and interaction, reflections on the method, and links to external sources. Available at: https://participedia.net.

New possibilities of engagement are opened by online channels. They can be used for such online-oriented engagement methods as deliberative online forum, or "physical" (non-virtual) methods can be adapted to run online, e.g. focus groups, or they can be organised as a combination of online and offline methods, e.g. distributed discussion. Users of online engagement methods have to take into consideration the different quality of interaction online, which might need more facilitation efforts, and other possible disadvantages. For example, strengths and weaknesses of online deliberative forum are discussed in its description in Action Catalogue: http://actioncatalogue.eu/method/7407

The marketplace for specialised online public engagement tools is scarce; however, at least some online discussions could be implemented with any general tool that allows for virtual group meetings, e.g. Skype, Hangouts, Facebook and other. However, there are some specialised online public engagement tools for public policy institutions, and for some purposes they could be adapted to use for public engagement in science, particularly topics that concern policy issues. As an example, here is a list of such tools grouped by purpose: http://blog.openplans.org/2014/12/21299/. Probably the most science-specific online engagement method is online-implemented citizen science, which was reviewed in the part I 1 on Research projects.

Step 4. Plan the timeline

The planning of engagement activities or project should identify the phases and timeline of implementation. The phases include such necessary steps as identification of prospective participants, development of an invitation list, development and distribution of the invitation message, preparation of guidelines/scenario of the event, preparation of written materials (if needed), and other.

The engagement event itself might be as short as a couple of hours, but it will need much more time for planning and preparation – from a month in case of simpler methods such as focus group, to as much as a couple of years for more complicated conference-like events. The above mentioned Action catalogue (http://actioncatalogue.eu) provides indicative time frames for each of the engagement methods. Time frame can be also used as a criteria of selection in the interactive data base of the engagement methods, so even the initial planning can take into account the time needed for organising of the event.

Step 5. Implement participation activities

During the implementation phase, the previously designed plan on the engagement activity is put into motion: the work on organising event is performed and the actual event(s) take place. Implementation phase encompasses several critical aspects that have to be taken care of:

- Guidelines/scenario/programme of the event;
- Recruitment of participants;
- Logistics (date and location);

- Materials and supply;
- Accommodation, meals and travel expense reimbursement (if applicable);
- Event promotion and registration (if applicable);
- Facilitator/moderator;
- Monitoring (for larger projects).

Many of these aspects are discussed in the "Participatory methods toolkit: A practitioner's manual" (http://archive.unu.edu/hq/library/Collection/PDF_files/CRIS/PMT.pdf). Numerous other guides provide useful information on practical aspects or specific issues of implementing engagement events, listed in the toolkit section.

A special attention during the stage of implementation must be given to ethical and legal aspects of involving outside participants. It includes such questions as principles of ethical communication, informed consent to participate, questions of authorship and other points. A useful guide was prepared by Centre for Social Justice and Community Action at Durham University and UK National Co-ordinating Centre for Public Engagement: http://www.livingknowledge.org/fileadmin/Dateien-Living-Knowledge/Dokumente_Dateien/Toolbox/LK_A_CBPR_Guide_ethical_principles.pdf

As noticed by PE2020 toolkit, engagement initiatives rarely go smoothly from beginning to end and often need adjustment of the original plan. The toolkit identifies and discusses in more detail three critical aspects of the implementation phase: recognising and coping with the implementation problems, being aware of the skills needed, and ensuring the follow-up: https://toolkit.pe2020.eu/toolkit/section-b-pe-methods-and-tools/b3-implementing-pe-initiatives/.

Finally, the implementation of participatory activities should include a follow-up phase. At minimum, follow-up means providing feedback to the participants of the event by telling them how their input is appreciated and letting them know how their input was used. It is important as it helps to create more stable relations with participants, in view of the participation initiatives in the future. It also can provide some information to understand if the initiative was successful or not. Some possible forms of follow-up are described in the text *Doing Public Dialogue*, developed by Research Councils UK, Involve, CSaP and Sciencewise, p. 37: http://www.involve.org.uk/sites/default/files/uploads/120727-RCUK-Resource-FINAL.pdf

Phase III: Dissemination, Evaluation and Exploitation

CBPR projects do not end with implementation of research and participatory activities. A necessary phase is follow-up activities, which include dissemination of a project's results, evaluation and impact assessment, and support provided to project's exploitation and long-term sustainability.

Step 1: Select the right communication and dissemination activities

Dissemination-related tasks of Science Shop projects include several types of activities: communication and dissemination, and, to a certain degree, exploitation (which is dealt with separately in the Step 3). **Communication** means informing about the project and its results to multiple audiences beyond the project's own community, including media and the broad public. **Dissemination** refers to disclosure of the project's results and ensuring their availability for others to use, including scientific publications. It is directed to audiences that may be interested in the potential use of the results, e.g. the scientific community, industrial partners, and policy makers. Communication and dissemination of Science Shop projects are intended to bring Science Shops outputs to the attention of as many relevant people and organisations as possible, in order to have a wider impact and to involve new stakeholders, participants and beneficiaries.

The nature of Science Shops' projects affects the approach to its communication and dissemination activities, as these projects are mainly done in answering requests of community organisations and can be of very different scales. Therefore, communication and dissemination activities will depend on a community organisation's preferences and will be carried out with its involvement or solely on its initiative, especially if the project is implemented by students. Participation of the Science Shop in communication and dissemination activities will also depend on the available resources. In the case of small projects such as student theses, communication from the Science Shop will probably be limited with such basic measures as messages about the project in Science Shop's or/and mother organisation's websites and social media. If a Science Shop has a communication manager or is supported by mother organisation's communication department, it can embark into more extensive communication and dissemination activities.

Interchange Liverpool (UK) is an independent Science Shop that has a partnership agreement with the University of Liverpool that includes access to graduate students to work on the projects. Its projects usually end with a report that is handed over to the 'client' community organisation. Community organization might carry out further dissemination on its own initiative. Students are sometimes invited to present their research at conferences on the community organisation's behalf (Garrison et al. 2018).

The Living Lab for Health (Spain) carries out projects for health promotion and transformative change of the research and innovation (R&I) system that are co-developed with different stakeholders, including the scientific and education communities, policy makers, business and industry, civil society organisations and citizens in general. These projects include educational programmes and participatory programmes related to R&I and governance, and they are carried out with and for the community. Dissemination and communication are a central part of the Living Lab for Health's work and communication is a key competence for those facilitating the participatory work. Each project has a team member responsible for communication, who provides updates at stakeholder meetings on communication activities. Videos and graphical material are also produced for projects for dissemination purposes. Each year, the Living Lab for Health also organises a big congress, where project results are shared. The congress acts as a key dissemination event and is usually attended by around 450 people such as students, policy makers, NGOs, researchers and healthcare providers (Garrison et al. 2018).

A wide range of channels/activities can be used for communication and dissemination (see Table 5). Their selection will depend on the project's scope and aim. The key here is to stay in line with the strategic goal of the project and select the activities that are best suited to achieve its objectives. In other words, the purpose of the communication and dissemination measure has to be defined, and who is addressed by it, then the best suitable tool must be identified and the activity that will optimally convey the message carried out.

In the case of dissemination, a minimum requirement and a common practice among Science Shops is Open Access to research findings. Science Shop's coordinators have to discuss the Open Access option at the beginning of the project or to include it into the contract, if there is one.

Table 5. Communication and dissemination channels/activities (partly based on Scherer et al., 2018)

Communication	**Dissemination**
- Mother organisation's/Science Shop's website (also a dedicated project website for large projects) - Project reports - Annual or occasional Science Shop reports (printed or online) - Press - Social media - Presentations in events	- Project reports - Scientific publications/posters - Open Access/Data repositories - User workshops - Training and teaching materials - Cluster meetings - Conferences - Brokerage events - Policy Briefs/Recommendations

Useful Communication & Dissemination tools and toolkits can be found here:

- "Making the Most of Your H2020 Project" (2018) presents definitions of communication, dissemination and exploitation tasks and includes a guide with practical tips on planning and implementing these activities. Prepared by Scherer et al. for European IPR Helpdesk. Available at: https://www.iprhelpdesk.eu/sites/default/files/EU-IPR-Brochure-Boosting-Impact-C-D-E_0.pdf;
- "Successful Communication: A Toolkit for Researchers and Civil Society Organisations" (2007) provides guidance and practical advice on communication activities. The toolkit includes several sections on different steps of communication activities: Planning Tools (strategy), Packaging Tools (writing messages), Targeting Tools (channels), and Monitoring Tools (monitoring and evaluation). Prepared by Ingie Hovland for Research and Policy in Development Programme, reprinted by Overseas Development Institute, UK. Available at: https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/192.pdf;
- "Communicating EU research and innovation guidance for project participants" (2014) presents practical tips on planning and implementing communication activities within projects. Prepared by European IPR Helpdesk. Available at: http://ec.europa.eu/research/participants/data/ref/h2020/other/gm/h2020-guide-comm_en.pdf.

Step 2: Perform project evaluation and impact assessment

Project evaluation is a systematic and objective assessment of an ongoing or completed project. The aim is to determine the relevance and level of achievement of project objectives, development effectiveness, efficiency, impact and sustainability (OECD DAC Glossary). Project evaluation adds to project's impact, as it helps to steer the project towards the set goals and assesses how well planning and managing for future impact is being done during the project cycle (ILO Technical Cooperation Manual).

Impact evaluation assesses long-term changes produced by the project. It is a tool conceived to rate the effectiveness of a project by determining the importance of changes triggered by its activities and

measured against a baseline scenario. Such changes cover all the positive and negative impacts; intended and unintended; and direct or indirect long-term results arising from the project activities in the economic, social, cultural and environmental arenas (Stanescu et al. 2018).

Although project and impact evaluation is presented here as a part of the final stage of project cycle, it can be performed at various points of the project. Before the project, evaluation could be carried out to identify the anticipated impacts of the projects. Performed during the project (monitoring), project evaluation serves a formative purpose to plan, to improve or reorient the ongoing project. During and after the end of the project, evaluation is done for summative purposes to determine the success of the project according to set criteria (e.g. satisfaction of participants or achievement of anticipated outcomes) and is used to draw lessons for future projects and for communicating project's impact.

As revealed by the study on Science Shop impacts, project evaluation and impact assessment is not a standard practice among Science Shops or, if done, it is not widely communicated, as examples of systematic impact assessment were very rare (Stanescu et al. 2018), most likely due to a lack of resources. While project evaluation might be indeed a superfluous activity for short term student-implemented projects, post-project impact assessment is beneficial for all Science Shops as a tool to show accountability and a useful source of evidences for future project proposals and fund-raising activities. Moreover, the recent emphasis on "research impact" or "third mission" of universities will heighten the need for universities to demonstrate their impact on communities, and this will also apply to Science Shops and how they collect evidence on their impact on community. Results of impact assessment is an invaluable source of information for communication and dissemination activities within the research community, civil society and interested authorities.

Several examples of impact studies/reports published by science shops or other CBPR initiatives:

- UTS Shopfront Community Program at the University of Technology Sydney (Australia): Impact report 2016, available at: https://issuu.com/utsshopfront/docs/shf057_fa1_impact_brochure_a4
- In 2016-2017, the Office of Community-University Engagement at the University of Victoria (Canada), co-sponsored a research project, Community-Engaged Research at the University of Victoria 2009-2015. The project examined the breadth and impact of community engagement initiatives that occurred at UVic between 2009–2015. The study identified 167 instances of impact at UVic, and calculated that $21 million was secured in research funding for community engaged projects between 2009–2015. One publication of the project was a brochure with 12 impact case studies that illustrate the impact of community-engaged research occurring at the university. The reports can be downloaded from here: https://www.uvic.ca/cue/research/our-research-projects/index.php.

Preparation of project evaluation and impact assessment will need to include a number of steps (based on Perares Project Evaluations 2012):

- To identify who in the Science Shop/project team will be responsible for overseeing and implementing the evaluation;
- To identify stakeholders and partners to be included in the evaluation;
- To discuss the purpose and procedures of the evaluation with the project partners/Science Shop stakeholders and set out the scope and aims of the evaluation;
- To prepare partners/stakeholders for the possibility that evaluation results may not be as expected;
- To prepare or select tools for evaluation.

The essential tool for evaluation and impact assessment, adapted to the kind of projects implemented by Science Shops, is the "Perares Project Evaluations" toolkit. It discusses methodology and process of evaluation, and presents four different checklist and survey forms for project and impact evaluation for different stages of a project: project's start-point, mid-point, end-of-project, and post-project evaluation (impact assessment). The toolkit was prepared by the PERARES (Public Engagement with Research And Research Engagement with Society, 2010–2014) project and is available here:

http://www.livingknowledge.org/fileadmin/Dateien-Living-Knowledge/Library/Project_reports/PERARES_Evaluation_toolkit_with_checklist_and_evaluation_form_2012.pdf

Communication and dissemination activities of a Science Shops can also be an object of evaluation, if a Science Shop wants to assess and update its communication and dissemination strategies. A useful resource on that is the extensive "Toolkit for the evaluation of the communication activities" from European Commission Directorate General for Communication:

https://ec.europa.eu/info/sites/info/files/communication-evaluation-toolkit_en.pdf.

Other useful Communication & Dissemination tools and toolkits can be found here:

- "Making the Most of Your H2020 Project" (2018) presents definitions of communication, dissemination and exploitation tasks and includes a guide with practical tips on planning and implementing these activities. Prepared by European IPR Helpdesk. Available at: https://www.iprhelpdesk.eu/sites/default/files/EU-IPR-Brochure-Boosting-Impact-C-D-E_0.pdf;
- "Successful Communication: A Toolkit for Researchers and Civil Society Organisations" (2007) provides guidance and practical advice on communication activities. The toolkit includes several sections on different steps of communication activities: Planning Tools (strategy), Packaging Tools (writing messages), Targeting Tools (channels), and Monitoring Tools (monitoring and evaluation). Prepared by Ingie Hovland for Research and Policy in Development Programme, reprinted by Overseas Development Institute, UK. Available at: https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/192.pdf;
- "Communicating EU research and innovation guidance for project participants" (2014) presents practical tips on planning and implementing communication activities within projects. Prepared by European IPR Helpdesk. Available at: http://ec.europa.eu/research/participants/data/ref/h2020/other/gm/h2020-guide-comm_en.pdf.

Step 3: Support exploitation and long-term sustainability

After the completion of project dissemination and evaluation, more actions can be taken for ensuring sustainability of project results and developing long-term relationships with community. Although it is extremely important, this after-the-project phase is often neglected.

Sustainability of project's results depend on their exploitation – use of project results in order to turn them into concrete value and impact for society. Generally, this is accomplished by people or organisations including project partners themselves that make concrete use of the project results, as well as groups outside the project as a result of project's dissemination and communication activities.

Here again, the nature of Science Shops' projects affects the approach to its exploitation activities. Science Shops projects deal with requests from community organisations, thus the intention to exploit projects' results by the 'client' organisation is programmed into the definition of the projects. They might be used to improve organisation's activities or solve a specific problem, or take some other form (see text box below for possible exploitation activities in research projects). Therefore, in smaller scale projects, which are usually implemented by students, this step can be reduced to a minimum or undertaken solely by the client organisation.

Exploitation activities in research projects (Scherer et al. 2018):

- Follow-up research
- Demonstrators and prototypes
- Designs/Design studies
- IP rights, such as patents
- FTO analysis/Market analysis
- Licences
- Transfer agreements
- Policy change
- Products and/or services
- Standards
- Business plan
- Start-ups/Joint venture

The actual exploitation of research results and recommendations by a 'client' organisation might be more or less successful due to a variety of factors which the Science Shop cannot influence, e.g. the situation in the community organisation or the influence of other stakeholders. Here the Science Shop's role could be to support the use of project's results through discussing the exploitation plans with the client organisation, contacting them from time to time and discussing the results of implementation of recommendations and long-term impact. In larger CBPR projects Science Shop also can be fully involved in performing follow-up and exploitation activities together with the stakeholders and end-beneficiaries.

In 2006, Wageningen University & Research Science Shop (the Netherlands) implemented Ons Buiten project. The research question was submitted by the Board of the Ons Buiten, which designed and developed community gardens containing small plots that were rented to citizens. The Ons Buiten community garden was developed in 1928, but now was on a list of community gardens designated to be transformed into a housing area. In this context, WUR Science Shop conducted a research project which included both senior researchers, as well as students. During the project, members of the community discussed and drew up a project plan in which they outlined the objectives of the community gardens and planned activities, as well as published a brochure that was considered "a welcome support and a source of inspiration for all those garden parks that face threats time after time". The findings of the study highlighted the fact that the garden was bringing a lot of value to the community and, furthermore, made recommendations to secure the future sustainability of the garden. The annual plans developed by the project contain both short (year) and long term (10 year) plans and outline the planned activities to be undertaken to achieve the goals. Twice a year, the steering committee meets to monitor and evaluate the activities (Stanescu et al. 2018).

It is crucial to set an exploitation plan that can last over time, involve young generations, share knowledge and vision and be multi-level: successful exploitation may in fact lead to external recognition of the work carried out, adding further credit to it and, as a consequence, involving new stakeholders and creating new partnerships. As in the case of communication activities, also exploitation needs to be tailored according to the target: identifying target groups, both at different geographical levels (local, regional, national, European) and in the field of the beneficiary (colleagues, peers, local authorities, other organisations leading the same type of activity, networks, etc.).

Some examples of ways to encourage exploitation are:

- Active Science Shops platforms;
- Active project websites;
- Meetings and visits to key stakeholders;
- Dedicated discussion opportunities such as information sessions, workshops, (online) seminars, training courses, exhibitions, demonstrations, or peer reviews;
- Targeted written material such as reports, articles in specialised press, newsletters, press releases, leaflets or brochures;
- Audiovisual media and products such as radio, TV, YouTube, Flickr, video clips, podcasts or apps;
- Social media;
- Public events (e.g.: Science Festivals and Cafe Scientifiques)
- Project branding and logos;
- Existing contacts and networks.

In terms of exploitation it is important to think also about how results can make a difference to the project, end-users, peers or to policy makers. Exploitation mechanisms, in fact, also include positive reputational effects for the participating organisations, increased awareness on a theme, target or area of work, increased financial support by other supporters or donors and increased influence on policy and practice.

In conclusion, CBPR projects performed by Science Shops are a powerful tool to build long-lasting partnerships with the community and make a long-term impact. According to a study on CBPR (Jagosh et al. 2015), CBPR projects can have a long-term impact on community by sustaining collaborative efforts toward research (building long-term collaborations), generating spin-off projects (unanticipated projects that arise through intentional CBPR activities) and achieving systematic transformations in the community (change of the physical, cultural, institutional, or policy context leading to improved outcomes). This is supported by studies on CBPR in Science Shops. Real-life cases show that after completing successful projects, community organisations turn again to the Science Shop for consultations and/or requests for further projects (Garrison et al. 2018). Besides solving specific problems and improving well-being of the respective communities, CBPR projects are able to empower community organisations in that they increase citizens' and organisations' knowledge about how research is done (Stanescu et al. 2018). Science Shops can add to these long-term impacts by ensuring the participatory nature of their community-based projects, creating relationships of trust and, wherever possible, providing support for exploitation of the project's results.

3. Supporting Resources for CBPR and Public Engagement

In the previous sections, we included references to best practices on implementing the specific steps of the roadmap. In this section, we provide a list of comprehensive toolkits to implement projects in Science Shops context.

Accelerating Public Engagement a Roadmap for Local Government

https://elabhome.blob.core.windows.net/city-accelerator/Accelerating%20Public%20Engagement-A%20Roadmap%20for%20Local%20Government_By%20Eric%20Gordon_Engagement%20Lab%20At%20Emerson%20College.pdf is a roadmap prepared for local government, however it can be very useful for practitioners of Science Shops as well. Produced byGordon, Eric.

Bit by Bit: Social Research in the Digital Age Book by Salganik and Matthew

https://www.bitbybitbook.com/en/1st-ed/preface/ Online and open edition book describing several strands of online research and engagement methods: “Observing behaviour”, “Asking questions”, “Running experiments”, and “Mass collaborations”. Especially relevant is the chapter on mass collaboration, which describes a number of real-life citizen science cases and provides a guide on designing own mass participation initiative:

https://www.bitbybitbook.com/en/1st-ed/creating-mass-collaboration

Do engagement

https://www.publicengagement.ac.uk/do-engagement provides guidance and best practice recommendations on how to plan, fund, deliver and evaluate public engagement activities. Produced by The National Co-ordinating Centre for Public Engagement.

Community-based Participatory Research

http://actioncatalogue.eu/method/7421 provides an overview of community-based participatory research with links to examples.

Community-based Participatory Toolkit

https://www.fsd.org/wp-content/uploads/2017/05/Research-Toolkit.pdf, provides guidelines on how to create research proposals, develop research plans and project designs, and carry out the full scope of a research project. Produced by the Foundation for Sustainable Development.

Community-Campus Partnerships for Health’s (CCPH) toolkits and databases

https://www.rri-tools.eu/-/community_campus_tools includes a number of tools and databases that help advance community-academic partnerships and address common barriers and challenges.

Community Research Toolbox

http://www.healthycity.org/cbpar-toolbox/ is a toolbox containing research concepts, methods, and tools through topical guides and toolkits such as Community Research, Participatory Asset mapping and a short guide to Community-Based Participatory Research. Produced by Advancement Project California.

How to co-create community-based participatory research

https://www.rri-tools.eu/how-to-stk-csos-co-create-community-based-participatory-research provides an introduction to RRI in relation to community-based participatory research with links to examples of projects as well as resources and toolkits.

Living Knowledge Toolbox

https://www.rri-tools.eu/-/science_shop_tools contains resources on Science Shop procedures, processes and guidelines and designed to help Science Shops and people working in community-based research to develop professional standards and improve their practices. Living Knowledge http://www.livingknowledge.org/ is an international network for those active in Science Shops and community-based research.

Participatory Action Research Toolkit

An introduction to using PAR as an approach to learning, research and action https://www.dur.ac.uk/resources/beacon/PARtoolkit.pdf is a toolkit produced by Durham University to provide guidance on what a PAR project commonly looks like, how to work together and some questions to ask as you go.PAR is an approach to research. It is a set of principles and practices for originating, designing, conducting, analysing and acting on a piece of research.

Participatory Methods Toolkit. A practitioner's manual

http://cris.unu.edu/participatory-methods-toolkit-practitioners-manual

Practice-oriented guide on participatory methods. Includes general guidelines and tips for planning and implementing participatory methods, as well as descriptions of a handful of popular methods.

PE2020 Public Engagement: Innovations for Horizon 2020

https://pe2020.eu/results/

Results page of the EC funded project PE2020 on public engagement in science. Presents results of numerous pilot engagement projects, typology of PE instruments, and other.

Public Engagement Innovations – Catalogue of PE initiatives

http://www.vm.vu.lt/uploads/pdf/Public_Engagement_Innovations_H2020-2.pdf

Deliverable of the project PE2020 presents descriptions of over 30 projects from various countries in public engagement in science. The projects are subdivided into sections according to the main aim of engagement: "Public Communication", "Public Activism", "Public Consultation", "Public Deliberation", "Public Participation".

Sparks Toolkit

A playful tool, provided by the H2020 Sparks project, to choose and implement successful participatory activities engaging citizens and multiple stakeholders in the practices of Responsible Research and Innovation; the toolkit offers practical advice on developing the most suited formats, tailored to your profile and objectives; It also provides concrete examples of how to deal with the topic of RRI through public engagement activities methodologies.

http://sparksproject.eu/sites/default/files/SPARKS%20TOOLKIT.pdf

Stakeholder Engagement: A Road Map to Meaningful Engagement

http://www.som.cranfield.ac.uk/som/dinamic-content/research/doughty/stakeholder/Guide.pdf is a roadmap prepared for business companies, however it can be very useful for practitioners of Science Shops as well. Produced by Jeffery, Neil.

Toolkit on public engagement with science

https://toolkit.pe2020.eu/toolkit/section-b-pe-methods-and-tools/b1-types-of-public-engagement-and-connections-with-the-organisational-processes/ is the interactive toolkit, which provides a good overview ofdifferent types of public engagement and connections with the organisational processes. It is subdivided into four chapters: “Strategic Framework”, “PE Methods and Tools”, “Institutional Anchorage”, “Societal Anchorage”. The toolkit provides many excerpts from other documents and links to further resources. Produced by the European Union's FP7 project PE2020.

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