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

D2.1

Baseline research and best practice report on participatory and community-based research

Project

Acronym: **SciShops.eu**

Title: Enhancing the Responsible and Sustainable Expansion of the Science Shops Ecosystem in Europe

Coordinator: SYNYO GmbH

Reference: 741657

Type: Research and Innovation Action

Program: HORIZON 2020

Theme: Participatory research and innovation via Science Shops

Start: 01. September 2017

Duration: 30 months

Website: project.scishops.eu

Consortium: **SYNYO GmbH (SYNYO)**, Austria

Handelsblatt Research Institute GmbH, Germany

University of Hohenheim, Germany

KPMG Limited, Cyprus

The National Unions of Students in Europe, Belgium

Institute of Social Innovations, Lithuania

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Wuppertal Institute for Climate, Environment and Energy, Germany

Vetenskap & Allmänhet, Sweden

Bay Zoltán Nonprofit Ltd. For Applied Research, Hungary

SciCo Cyprus, Cyprus

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Deliverable

Number:	**D2.1**
Title:	**Baseline research and best practice report on participatory and community-based research**
Lead beneficiary:	Institute Jožef Stefan (JSI), Slovenia
Work package:	WP2
Dissemination level:	Public (PU)
Nature:	Report (RE)
Due date:	31.01.2018
Submission date:	31.01.2018
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Executive summary

The SciShops.eu project (Enhancing the Responsible and Sustainable Expansion of the Science Shops Ecosystem in Europe; H2020 RIA, SwafS–01-2016; https://project.scishops.eu/) aims at expanding participatory research and innovation through further building on the capacity of science shops in Europe and beyond. In this context, a comprehensive and consolidated overview of the past endeavours and existing practice in performing participatory research has been completed by means of literature search and review.

The literature reviewed includes research articles, project reports, books, presentations, policy documents, manuals, guides, factsheets, infographs and case-studies. Altogether 211 literature items have been reviewed. The review showed that there is a lot of knowledge and experience in participatory research available throughout the world, however, needs, beliefs and endeavors for further improvement are emphasized. Researchers expect help and effective engagement of the high-level decision-makers (ministries, governments, funding agencies) in terms of supporting and expanding community based participatory research (CBPR) by more systematic and stable funding while the communities (community social organisations, citizens, stakeholders) need assistance in capacity building both from researchers and their local representatives. They also expect tangible support in making changes based on research evidence.

With regard to best practices, the following may be used as an orientation about desired features of, and recommendations for, CBPR and science shops: build and maintain an effective partnership; build on community, academic, and other partners' strengths in studying and addressing shared concerns; use approaches and processes that reflect local community culture and ways of doing things—even if it slows down the process; use forms of data collection and results presentation that can provide help in policy change; demystify the policymaking process: trainings and other tools can help the partnership better understand and navigate the policy process; also engage younger population in CBPR; communities can work together on higher levels (e.g. regional, national) on efforts to improve health, the environment, and other societal issues.

Regarding evaluation, recommendations are directed towards more integral evaluation practices in both CBPR and science shops. Such evaluation should also involve a process and impact component: While the process component should cover all phases of research from planning, over execution, to the use of results, the impact part should also include measurement of success and benefits as perceived by a community, particularly when achieved through its active involvement aimed at bringing concrete improvemens and changes in the community. Additional indicators and measurements are to be used in the integral evaluation practices, e.g. with use of respect, trust, legitimacy, fairness, competence, accountability, fit-for-purpose, effectiveness. The outcomes should be checked in terms of goals achievement and the meeting of the expectations of the research participants. *Ex-post* evaluation should cover follow-up of the implementation of research results in terms of monitoring expected changes in the society.

A tangible product of the literature search is a spreadsheet, where all reviewed literature items are included with their key attributes. A reader may there find the information on the projects, cases, manuals, guides etc. on CBPR performed in different parts of the world – Africa, Asia, Australia, Canada, Europe, USA. The spreadsheet is organised in an efficient way to quickly find information on the type and organisation of CBPR, topics covered, funding, stakeholders involved, location of research, impacts gained from its activity, factors contributing to sustainability and long-term implementation, as well as key messages for future work on the SciShops.eu project.

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Glossary and definitions

Multiple definitions, specific explanations and interpretations of CBPR have emerged in the last 50 years, based on specific research contexts and experiences. In this context we find it appropriate to include some of the basic (initial) definitions with extended explanations for the key notions related to CBPR, CBP, PAR, Living Knowledge, RRI, Citizen Science. These could be found in different sources, e.g. research articles, project reports, web pages, etc. (Leydersdorff and Ward, 2005; McKinley et al., 2012; Mulder, 2014; Sparks, 2016; Shallwani and Mohammed, 2007)[1].

A definition of a science shop is included in this list to clearly show a distinction between the concept of participatory research and its implementation, which is important for identifying practical features of participatory research like organisational aspects, effectiveness of establishing partnerships, formal application for funding, etc. In this way we show both the substantial core and width of the perceptions developed through time on one side, and basically similar (if not the very same) meaning of the CBPR on the other. The key elements (attributes) of similarity and diversity is summarized in Table 1.

Selected abbreviations are:

AR - Action research

CBPR – Community Based Participatory Research CBR

CBR – Community-Based Research

PAR - Participatory Action Research

RRI – responsible Research and Innovation

AR - Action research
AR is a way of generating research on a social system while simultaneously attempting to change that system. While traditional social science aims at producing knowledge on social systems (some of which may eventually prove useful to those wishing to effect change), action research seeks both to understand and to alter the problems generated by social systems.

Action research can be described as a family of research methodologies that pursue action (or change) and research (or understanding) at the same time. Principles of action research are:
- Uses a cyclic process, which alternates between action and critical reflection and in the later cycles, continuously refining methods, data and interpretation in the light of the understanding developed in the earlier cycles.
- It is thus an emergent process that takes shape as understanding increases; it is an iterative process that converges towards a better understanding of what happens.

CBPR – 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.

The basic idea behind CBPR is to democratize research and spread results more efficiently. Community-stakeholders bring in their knowledge and perspective and will also get an increased understanding of the value of scientific research. They also understand the methodological scientific background and

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[1] http://www.livingknowledge.org/; www.livingknowledge.org/projects/perares/; http://actioncatalogue.eu/method/7421; http://actioncatalogue.eu/; https://ec.europa.eu/research/swafs/pdf/pub_rri/KI0214595ENC.pdf; https://www.rri-tools.eu/)

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are more likely to effectively implement necessary programs and actions than they would if being faced by expert advice. This can make the scientific process more transparent, involve practical knowledge from outside specific scientific disciplines, strengthen the public reputation of scientific advice and sustain project goals beyond the scope of predefined funding periods. Also, CBPR helps scientists to think outside of their predefined research agendas to answer questions that are relevant for society and being noticed and understood by a wide audience. This, in turn, helps scientists to improve their work by taking new perspectives and see 'the bigger picture'.

CBR – Community-Based Research
CBR is a research activity, performed by public or private, commercial or non-commercial institutions, in response to community's needs. These needs are preferably formulated through community-based research questions.

CBR is a collaborative research approach between the university and community when academics and students work with community-based organisations to define the research questions and develop appropriate strategies to address those questions. In this research approach, community members are active participants and collaborators in the research process and are empowered to develop their own work through the participatory research process. The goal of CBR is to initiate positive social change and social action to achieve social justice through research evidence. CBR is rooted within the community and benefits the community. Basically, CBR is the same as CBPR.

PAR - Participatory Action Research
PAR is collaborative research, education and action used to gather information to use for change on social or environmental issues. It involves people who are concerned about or affected by an issue taking a leading role in producing and using knowledge about it.

Like CBPR and CBR, the PAR research process is also 'participatory' with the following features:
- It is driven by participants (e.g., a group of people who have a stake in the environmental issue being researched),
- Rather than an outside sponsor, funder or academic (although they may be invited to help),
- It offers a democratic model of who can produce, own and use knowledge,
- It is collaborative at every stage, involving discussion, pooling skills and working together,
- It is intended to result in some action, change or improvement on the issue being researched.

Participatory research/Citizen Science
The terms citizen science and participatory research are often conflated, although they are different models which differ fundamentally in participation, process, and goals. Citizen science closely resembles the process and goals of traditional research and might be broadly characterized as an extension in researchers' capacity, researchers being scientists and members of the general public. In contrast, participatory research might be characterized as democratization of the research process, whereby the public that uses the information is directly involved in how and why the research is undertaken, with the intent of direct implementation based on research outcomes.

Participatory research comprises a range of methodological approaches and techniques, all with the objective of handing power from the researchers to research participants, who are often community members or community-based organisations. In participatory research, participants have control over the research agenda, the process and actions. Most importantly, community members themselves are the ones who analyse and reflect on the information generated, in order to obtain the findings and

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conclusions of the research process. The research conducted aims at influencing decision-making processes and impact people's lives on a local and national level.

Citizen Science is scientific research conducted, in whole or in part, by amateur (or non-professional) scientists. It is sometimes described as 'public participation in scientific research', participatory monitoring and participatory action research. It is based on the conventional research model, but differs by who collects data or how knowledge is exchanged. Many citizen science projects, particularly those done by non-governmental organizations (NGOs), do not explicitly test scientific theory, but rather focus on 'surveillance' monitoring. Volunteers can greatly increase the rate of data collection and keep costs low.

Science shops

Science shops (are facilities, i.e., a mode of CBPR that) provide independent and participatory research support in response to concerns experienced by civil society.

Science shops are one of the modes of community-based research that aims to establish productive, mutually beneficial collaborations between community organisations and research institutions. The initial idea behind science shops was to provide a specific location at the university where citizens and community groups could directly get in touch with researchers to help solve community-related problems. Regardless of the process, the results of all science shops activities are openly shared with community members, and made available for future community use. First science shops were established in the Netherlands in the 1970s.

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Potential knowledge generation pathways for science delivery[2]			
Attributes	**Traditional/basic research**	**Citizen science**	**Participatory research (PAR, CBR, CBPR)**
What is the research for?	Understanding with potential applicability for management	Understanding/public literacy and engagement, with potential applicability for management	Understanding/public engagement and literacy, explicit applicability for social or management action
Whom is the research for?	Explicit or implicit public interest, institutional, personal and professional interests	Explicit or implicit public interest, institutional, personal, professional and public interests	Explicit public interest
Whose knowledge counts?	Scientist's	Scientist's/Public's	Scientist's and Public's
Topic Origin	State funding agencies, private institutions	State funding agencies, private institutions	Local people but can be shared
Topic Influences	State via funding priorities, institutional agendas, professional interests	State via funding priorities, institutional agendas, professional interests	Public or private funders, special needs
Methodology primarily chosen for...	Scientific rigor	Scientific rigor, sometimes public engagement and learning	Empowerment, mutual learning
Research cycle	Iterative in the domain of science	Iterative in the domain of science	Iterative in the domain of management
Primary research purpose	A priori hypothesis testing	Monitoring and fundamental understanding	Problem solving

[2] Conventional/basic research emphasizes knowledge generation in which the public user is often absent or very limited. Research outcomes from this kind of research are generally not intended to inform non-technically oriented users, decision-makers, or general public and often not intended to directly inform choices for carrying out research outcomes. Citizen science uses public in conventional research, typically by including volunteers in data collection. Scientists can benefit from having more robust data sets where large amounts of data are needed over space or time. The most visible public benefit is greater science literacy. By contrast, participatory research emphasizes the needs of local public users by engaging them throughout the science-based decision process. Knowledge generation is a shared domain of the public, professional resource managements, policy and decision-makers. Participatory research focuses on generating socially supportable management and action with research outcomes.

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Motivation - Scientist	Self	Self (enhanced data collection)/ passion for science education and communication	Self and desire to promote positive social action
Motivation - Institution	Funding and reputation	Funding, reputation, education and potential recruitment	Funding, reputation and enhanced capacity to promote positive social action
Motivation - User	Access to best available science	Increase knowledge, satisfy curiosity, sense of service, personal pursuit	Tailored solutions
Stages of the research process			
● Problem identification	Researcher/resource manager	Researcher, environmental NGO	Shared with local public and scientist
● Data collection	Researcher, enumerator	Researcher, enumerator, public	Local public
● Interpretation	Researcher — disciplinary concepts and frameworks	Researcher — Disciplinary concepts and frameworks	Shared: Researcher and local public — social and environmental context
● Analysis	Researcher	Researcher, sometimes public	Shared: Researcher and local public
● Presentation of findings	Researcher — various professional media	Researcher — various professional and public media, strong educational/outreach emphasis	Shared: various media — process requires bidirectional communication and feedback
Research outcomes			
● Action on findings	Not a priority	Typically, not a priority	Integral to the process
● Who takes action?	Policy/decision-makers, external agencies	Policy/decision-makers, external agencies	Local public with/without external support
● Who owns the results?	Researcher	Researcher	Local people but can be shared
● What is emphasized?	New knowledge, application of knowledge	New knowledge, application of knowledge	New knowledge and application of knowledge leading to action

Table 1: COMPARISON OF SOME MAJOR ATTRIBUTES OF CONVENTIONAL RESEARCH, CITIZEN SCIENCE AND PARTICIPATORY RESEARCH. Portions adapted from McKinley et al., 2012.

1   Introduction

This report provides an insight in activities of Task 2.1 (WP2) of the SciShops.eu project with the emphasis on results of the literature review. The literature reviewed includes research articles, project reports, books, presentations, policy documents, manuals, guides, factsheets, infographs, and case-studies. The review was aimed at collecting information on characteristics and impacts of CBPR and science shops.

The report consists of six main sections. The Introduction is dedicated to a brief information on the purpose of literature review and the organisation of the report. Section 2 provides a description of the background and goals of literature review. Results are presented in section 3. The sub-section 3.1 presents information regarding characteristics of CBPR and science shops (organisational form, participants, topics and scope of research, funding), while the sub-section 3.2 describes the impacts of CBPR on the community/society (processes and relations established; utility of participatory research; experience, participation, outputs in terms of the participants' overall satisfaction; long-term impacts). Sub-section 3.3 provides a summary on best practice of CBPR and science shops. Section 4 is a synthesis of the literature review results giving key messages for future work on the project. Section 5 is a concluding paragraph giving a reflection to the overall aim and achievements of the literature review. Section 6 is dedicated to five Appendices. First, the approach and method to literature search is described in more detail. Second, the Excel table of literature selected and reviewed is provided. Third, an indicative Table showing key messages extracted from the literature is given. Fourth, a Table with selected literature items demonstrating how impacts of CBPR were extracted from the literature is provided. This is useful as a guidance either on subsequent repeated reading (if needed), or for those who were not engaged in the literature review but would like to read most informative items with least time-consuming efforts. The fifth Appendix is a copy of the Reading Guide (included for transparency purposes). Its aim was to support readers of the selected literature in extracting information consistently and effectively.

2 Literature search

The literature search was aimed at providing a relevant and comprehensive collection of the studies, reports, statistics, policies, best practices, strategies and initiatives in the participatory and community-based research field across Europe and worldwide. The review then was focused on the identification and analysis of the characteristics and impacts of CBPR and its different modes, particularly science shops.

A Boolean search strategy was applied to generate manageable number of relevant results from the Scopus database and by using Google search engine (EFSA, 2010; Kocman et al., 2016; Souleymanov et al., 2016; Syed et al. 2017). Keyword identifiers were used to tailor the search. A flowchart summarizing the searching process is presented in Figure 1. Detailed information on the approach is provided in Appendix 6.1. In total, 211 literature items were selected and reviewed, see Appendix 2. They are accessible at https://drive.google.com/drive/folders/0Bx4Uzkj2OV2rVmxrQV9PYzZucGc.
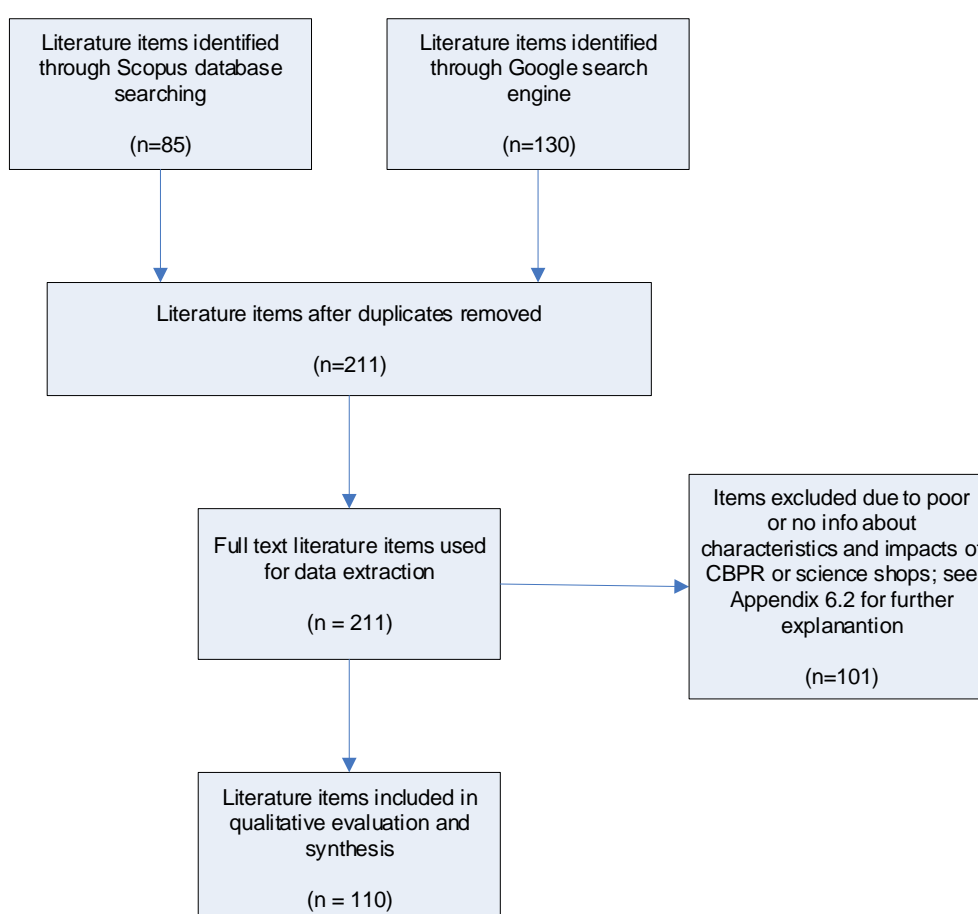
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┌──────────────────────────┐   ┌──────────────────────────┐
│ Literature items         │   │ Literature items         │
│ identified through       │   │ identified through       │
│ Scopus database          │   │ Google search engine     │
│ searching                │   │                          │
│ (n=85)                   │   │ (n=130)                  │
└──────────────────────────┘   └──────────────────────────┘
              │                              │
              └──────────────┬───────────────┘
                             ▼
            ┌──────────────────────────────────┐
            │ Literature items after           │
            │ duplicates removed               │
            │ (n=211)                          │
            └──────────────────────────────────┘
                             │
                             ▼
            ┌────────────────────────┐        ┌──────────────────────────┐
            │ Full text literature   │        │ Items excluded due to    │
            │ items used for data    │───────▶│ poor or no info about    │
            │ extraction             │        │ characteristics and      │
            │                        │        │ impacts of CBPR or        │
            │ (n = 211)              │        │ science shops; see        │
            └────────────────────────┘        │ Appendix 6.2 for further  │
                             │                │ explanantion             │
                             ▼                │ (n=101)                  │
            ┌────────────────────────┐        └──────────────────────────┘
            │ Literature items       │
            │ included in            │
            │ qualitative evaluation │
            │ and synthesis          │
            │ (n = 110)              │
            └────────────────────────┘
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Figure 1: Flow diagram of literature selection for review

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2.1. Scopus database

The objective of the Scopus database search was to find recent (published in the last 10-15 years) peer reviewed articles on CBPR/science shops. Initially, consideration has been made to search more than one archive, i.e. Web of Science (WoS), Cochrane Database of Systematic Reviews (CDSR), Current Contents, EMBASE, MEDLINE, Scisearch, Scopus, Google Scholar, Medline-Ovid, EC's Library and e-Resources – ScienceOpen, etc., however, based on preliminary search it was learned that search of more than one archive would result either in an un-manageable number of literature items, or in the application of restricting filtering criteria which would sharply narrow the results from each of the archives. Eventually, the Scopus has been selected since it provides a wide collection of research topics under CBPR together with good accessibility to identified literature items. Altogether, 85 literature items have been selected from this source.

Out of 85 literature items, 69 are scientific (research) articles, 12 are review papers, 3 are conference papers, and one is a book chapter. The items included have been published after year 2000, with two exceptions dating between 1995-1997.

2.2. Google search engine

The objective of the Google search was to supplement the literature selected from the Scopus database with valuable information provided for in reports, guidelines, manuals, project reports, presentations, factsheets, books, book chapters, PhD and master thesis, and infographics (which are not available in the Scopus database). Thus, using the same key words as in Scopus database the search resulted in 130 items. However, during the reading process 4 duplications have been recognised and removed from the list due to mis-spelling of the authors' names or different title of the item. Eventually, this part of the literature search resulted in 126 items.

From these, 48 are articles, 6 are PhD and master thesis, 9 are presentations, 1 is infographic, 24 are guides, 29 are reports, 3 are papers in proceedings, 2 are factsheets and 4 are books/book chapters.

Many of the identified documents will be useful for all partners in their work on different tasks. The guides and the reports were created under projects dealing with science shops and community-based participatory research. Therefore, they will be a considerable resource in establishing synergies between SciShops.eu and other projects and initiatives.

3 Results: characteristics and impacts of CBPR and science shops

3.1 Characteristics

The following overview of information regarding characteristics of CBPR (science shops) follows the structure of the Literature Read Table (see Appendix 6.2) and the Reading Guide (see Appendix 6.5) with the emphasis on the stakeholders involved, funding, and topic and scope of the research.

Location of research

From the 211 literature items 142 reported the location where the study took place or from which geographic areas the participants were included. The distribution of the locations where studies have been carried out is scattered globally. However, a distinction regarding the representation can be made – the majority of studies have been carried out in Europe (53), followed by the Unites States of America (35 examples). The areas with a relatively frequent representation of studies include Canada (8), Australia (5), Africa (5). Other parts of the world were represented to a lesser extent.

Some of the studies covered broad areas such as the entire Europe, USA or Canada, while others were oriented to smaller communities covering micro-locations (for example: selected cities or city quarters (Ochsner et al., 2008). Also, in some studies the details about the location was not explicit – the case descriptions often include the terms such as »international« or »diverse« or the participants are described simply as »project participants« or »Countries with tropical forests« with no other reference.

Stakeholders involved

In terms of stakeholders in the function of mother organisation, we can establish that from about half of the items reviewed, the majority is represented by universities and faculties (66), followed by 11 research institutions, the rest are NGOs and health organisations. Research institutions are represented by 8 examples. The other less frequent types of organisations include trust funds and corporations.

The participants in the studies are vastly diverse. The most represented groups of participants include predominantly local populations consisting of citizens, local government/authorities/administration representatives, representatives working on specific topics of interest of particular studies (natural resource management, health, food supply, day-care centres) as well as local academic partners and NGOs.

In the field of health and quality of life, represented stakeholders most often include the patients and their family members, Health Care Providers, caregivers, public health professionals, academic researchers, professional associations, patient advocates, payor and health policy representatives (Abma et al., 2009; Case et al., 2014; Wolfson et al., 2017).

For specific natural resource sectors, the selected studies focused primarily on agriculture. The engaged stakeholders are primarily workers (migrants) in different segments, e.g., farmers and agricultural consultants, in forestry forest communities, and in fishery fishers, fishing membership associations, fish consumers, agencies that regulate fish takes, health advisories, and public health professionals (Rao et al., 2004).

Another important stakeholder group is the one related to communities and wellbeing. This group primarily consists of people living in poor conditions (poverty), service providers, business owners, advocacy groups and policy-influencers at all government levels (Reutter et al., 2005).

Specific social groups include young people in parenthood (mostly mothers), young offenders and their families, migrant populations as well as activists in various fields of interest (e.g. traffic, measures for persons with disabilities, etc.) (Petrie et al., 2006). In the field of education, the most often involved stakeholders include pupils/students and their parents, educators (teachers) (Rogge and Rocha, 2004). Religion related stakeholdes were also identified, in a lesser extent, to represent mainly prayers or faith-based community organisations (Derose et al., 2010).

Funding

Funding is explained as an important aspect of the success of the CBPR and vitality of a science shop, but for approximately 45 studies it is not clearly stated how the funding was provided. Most of the research articles provide this information in the acknowledgements and relates to a specific research project, so this kind of funding is not a (part) of the regular funding scheme.

Many science shops do not receive any permanent subsidies or financial support. In addition to grants for specific projects, the core of their work is funded by the income from publications and paid services, as well as through training activities. Funding clearly depends on the type of research carried out, but the funding options can be summarised in the following categories:

- Various forms of grants are the most frequently represented form of funding; EU FP6 and FP7 have an important role for Europe's CBPR and science shops in addition to different government funding (ministries, development agencies etc.), as well as grants from science foundations, agencies, private sector and charitable organisations. Research councils and centres have also been frequently identified as funds contributors.

- For the university-based science shops, the funding they receive is a part of the mother organizations (i.e. university budget). It must be noted that in some examples this funding is only partial and can cover as little as assistance and consumables (part-funding by attracting external funding from government or European programmes or private and charitable grants), to full funding (direct financial support) on the other side (Jorgensen, 2008).

- Studentships and research grants are also an available funding scheme, particularly in cases where universities or funds provide dedicated studentships and grants for Master/PhD level students or researchers in Science Shops (Brodersen, 2010; Gagliardi, 2008).

- Some science shops act as social entrepreneurs supporting socially beneficial research with NGOs (European Commission, 2003; Jorgensen, 2008). Staff conducts profitable research or other activities with organisations and funding agencies, which can pay market costs.

- Another important source of funding are the funds/grants/donations from health institutions – in this review these consist of 17 examples. Again, the topic of research plays an important role.

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Topics and scope

It should be noted that a large part of studies (52) details various participatory research practices in different countries. In Europe, science shops are prevailing, while in the US, Canada, Australia, Africa mostly ad-hoc, project related research associations with stakeholders are a common mode of CBPR (Boere and Heijman, 2011; Jorgensen, 2014; Leydersdorff and Ward, 2005; Pearce et al., 2012, Street et al., 2007). The literature review also revealed that the studies show a variety of experiences in terms of addressing the research topics. Different reasons are identified for variety of topics and the scope of dealt with. For example, in the US the focus is on health, policy action-oriented research in the public health arena, and vulnerable populations' issues, also occupational health (Belansky et al., 2011; Deverka et al., 2012; Parker et al., 2010), while in Central and Eastern Europe environmental issues prevail (Gall et al., 2009; Mulder et al., 2014; Teodosiu and Teleman, 2003). In Scandinavian countries social issues are in front, e.g. assistance to elderly and education (Jorgensen, 2014; Zaal and Leydesdorff, 1987), similar is in Africa (Namazzi et al., 2013). Hicks et al. (2012) recognize and put attention on epistemic barriers and social values, which eventually determine topics, scope, and performance of the research, so need to be taken into account, like different styles of thought, research traditions, techniques and language that are difficult to translate across disciplinary domains.

Studies focusing on participatory research as such are mostly oriented towards presenting the experiences of actors involved in the set-up research partnerships. Important focus is on outlining the benefits of, and the obstacles to, participatory research, and to identify key principles that can ensure that such partnerships bear their most fruitful outcome (Gall et al., 2009).

Initiated in social sciences and in the health sector, participatory approaches are increasingly used in sectors where natural sciences have a more prominent place, such as environmental sciences or agriculture (Gall et al., 2009). Health issues such as approaches to treatments for various diseases (cancer, HIV, obesity, diabetes, mental health) are high on the list (Deverka et al., 2012; Doorenbos et al., 2011; Fish, 2016; Gagliardi et al., 2008; Greiner et al., 2014, Hicks et al., 2012; Johnson-Shelton et al., 2015; Kagan et al., 2012), followed by more general health-related research such as general healthcare and related policies and practices (Musesengwa and Chimbari, 2017; Lavis et al., 2010).

Social topics are strongly represented with the main topics targeting equity (Mairhofer, 2015), community development and wellbeing (Minkler et al., 2012) and care for the elderly population (Wright et al., 2017; Zimmerman et al., 2009).

 The generic problems are addressed in 27 literature items. Within these, the main focus is on describing the analytical framework and design/approach of participation in the research processes. Criteria for participatory practice research in general and participatory futures research in particular are discussed, mainly in terms of stakeholder engagement (Phillipson et al., 2012; Lavallee et al., 2012; Pandi-Perumal et al., 2015). The studies focusing on particular problems are represented in a slightly larger extent – 31 examples. These tackle specific issues in the fields of health, nature/environment/resources, social issues, and education.

Mode of operation

According to the Reading Guide (Appendix 6.5) the purpose here was to identify how the research entity is organised – e.g. whether it is a form of a science shop, science cafe, online, etc. The review and statistics show relatively low number of literature items providing clear distinction of entities regarding the mode of operation. This may be due to the fact that a vast number of studies is a general

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research about approaches and methods applied in CBPR (e.g., desktop analysis, review studies) (Martin and McKenna, 2013; Boyle, 2012; Leydersdorff and Ward 2005; Marschalek, 2017). On the other hand, those with actual deployment of specific CBPR, discuss components of the research other than mode of operation.

The modes of operation in the selected literature are researchers'-initiated studies called CBPR, CBR, PR, science shops, focusing on prior recognised societal/community issue. Such CBPR are primarily aimed at developing possible intervention actions, which, for different reasons, were then rarely transformed into real life and desired changes. Reports (publications) on such CBPR therefore mostly discuss analytical methods applied together with participation efforts (like processes of finding adequate survey participants to perform interviews and surveys with focus groups or selected individuals, e.g. patients, school children and parents etc.). Various forms of partnerships among researchers and participants were also a topic in these efforts; modes of their collaboration include various discussion/promotion centres, platforms, workshops, use of fact sheets etc. (Belansky et al., 2011; Deverka et al., 2012; Greiner et al., 2014, Hicks et al., 2012; Johnson-Shelton et al., 2015; Kagan et al., 2012; Parker et al., 2010).

3.2. Impacts

The following overview and synthesis of information regarding impacts of CBPR (science shops) is based on 110 reviewed literature items. The approach applied has been taken and partly adapted from the PERARES project (PERARES, 2012). Four components of the impact have been searched for in the reviewed literature, namely:

- Processes and relations: info on the awareness of CBR, relations between academics and CSO, influence on the direction of further research in the subject area, increase of client's knowledge of how research is done, etc.;

- Utility: info on the increase of capacity to apply research results in a societal context, whether and how capacity to participate in research has been increased or evolved, whether research area has been strengthened, etc.;

- Experience, participation and outputs: demonstration and approval of the success, satisfaction, usefulness, development of research questions, etc., particularly about participants' overall satisfaction, meeting of the end-users' needs, development of common ideas, development of a common understanding of the problem area, efficiency of partnership, usefulness to a wider public than the immediate client, students' motivation and commitment, relevance to academic research (publications, appearances or contributions in public media, requests for advice on policy or legal issues relating to the project topic); and

- Longer-term impacts: raise of societal awareness of the issue, development of new research collaborations, reinforcement of existing research collaborations, development of new research areas and curriculums, establishment of new research centres, stronger collaboration with industry, etc.

Processes and relations

There are just a few literature items that explicitly discuss this kind of impacts of CBPR. One of these is a Guidebook for Collaborative Research Internships (AHPRC, 2006). The processes and relations are

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discussed among student interns, who lived in the rural communities they were working with. It is important to emphasize that the intern program evolved over the four years and although each year had its successes and challenges, the final program reflected the most up-to-date changes based on all previous recommendations.

Another guide (Boyle, 2012) suggests that the analysis has demonstrated that PAR is seen as a useful and effective tool for reviewing and improving practice and furthermore has helped develop positive outcomes for clients and services alike. Furthermore, several services provided feedback that their projects were successful, and would appreciate the opportunity to share their learnings and experiences of PAR with colleagues.

Relations and roles of stakeholders engaged in a CBPR are described in more detail in Case et al. (2014). Consumers were actively involved in all aspects of research and action. They took a leadership role in the framing of the focus group questions, facilitated focus groups, analyzed data, shaped the ways results and recommendations were presented, as well as the findings and recommendations to stakeholder groups.

By doing research projects with and for civil society in the curriculum - through science shops and similar intermediaries - many universities throughout Europe can advance public engagement in an affordable and mutually beneficial way. Supporting these universities with seed funding and mentoring/training by European experts is an efficient tool to set-up new science shops. Setting-up science shops without the active cooperation of universities is rather complicated. Summer schools are a good way to reach out to more interested actors (Fischer et al., 2004; Mulder, 2014).

There are also caveats regarding relationships in CBPR (Johnson-Shelton et al., 2015). The way a community–researcher partnership develops in a CBPR study can vary and ultimately impact how, by, and for whom the research is conceptualized and conducted. In some cases, a community may invite a researcher or research team to work with them. In other cases, the researcher or research team may approach a community to undertake research on a topic the investigators perceive as a public health challenge for the community.

Another practical treatment of relations and processes in CBPR is provided by Lawrence et al. (1999). Their paper presents a participatory research planning workshop for an aquaculture project in West Bengal. It focuses on the workshop process and relations rather than on the technical content.

Guidelines (Pandi-Perumal et al., 2015) systematically treat the components and processes for effective and useful partnership development inside stakeholder engagement and management. Capacity building and exchange of experience, long-lasting collaboration in teaching, research, and service is thoroughly described in the article on university-community partnership centres (Rogge and Rocha, 2004). Street et al. (2007) also point out that 'collaboration has at least two definitions: To co-labour or share the effort of a difficult task and to work with the enemy as a collaborator'. Successful collaboration may be more about conflict resolution than any other factor.

Among reviewed literature one may also find calls for clear and more effective prioritisation of knowledge transfer which should come from both governmental level and universities. Benneworth and Oborne (2013) argue that only if European governments (and the EC) prioritize community engagement, it will become significant for universities. As European government becomes more specialized, technocratic and deracinated, Europe's universities need to get back to their roots, roots that lie in engaging with Europe's diverse publics. Governments need to drive universities to better engage, and universities should be vocal in demanding this from them. Only when this is achieved,

governments and universities will work better together to meet societal needs and harness the power of universities' diverse knowledge bases to drive a sustainable and inclusive Europe.

Eight "lessons learned" (Hicks et al., 2012) may be helpful to partnerships, funders, and consumers of community -engaged research:

- Contextual evaluating CBPR and community-engaged science,
- Effective Use of advisory committees,
- Honoring each other,
- Capacity developement,
- Role of advocacy with a strong community partner,
- Working to overcome historical trust issues within community research partnerships,
- Messaging: The language of community benefit,
- Benefits and challenges of funding.

A comprehensive and systematic overview of characteristics and benefits of CBPR, adequate for learning and training purposes is provided in Weymer and McDonald (2013), Zimmerman et al. (2009).

Utility

This type of impact is even less covered in the reviewed literature than processes and relations despite the awareness and recognition of its importance. Most often, it is stated that capacity to apply research results in a societal context need to be improved by intervening towards establishing stronger and long-lasting trust and partnership, training, and motivation among stakeholders involved in CBPR or science shops. Literature items, which discuss the issue more explicitly, are listed below.

A comprehensive insight on how citizens could be active researchers, what kind of barriers appear in participatory research – especially cultural or prejudice -, ratings of importance of reasons for participation in CBPR, as well as perceptions of benefits and drawbacks experienced as a result of participating in the CBPR can be found in Wolfson et al. (2017), Wortmann et al. (2005), Wright et al. (2017).

In Abma et al. (2009) additional benefits to the research process based on collaborating with the patient research partners has been generated: revealing prejudices; bringing in experiential knowledge; translating jargon; establishing trust; acknowledging the patient's perspective; developing new perspectives.

Brodersen (2010) argues that it is not enough to rely on scientific documentation as the only means to achieve impact on the issue of concern, but it is also necessary that scientists and the science shops are willing to engage themselves in other ways than just producing knowledge. The approach the science shop should apply in this process is the impact-seeking approach. Changes made in research and curricula at the universities can therefore put forward to the science shop, e.g.: research programme and new course modules within urban ecology, cleaner production, environmental management and concerning technological change and co-operation between experts and citizen groups (Brodersen and Jorgensen, 2007).

American Indian investigators significantly increased the odds of participation if respondents perceived the research would address a serious problem in their community, such as diabetes or cancer, or if the study would bring money into the community (Noe et al., 2007).

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Students reported benefits of participation that included increasing critical thinking skills, changing perspectives, and practicing facilitation and decision-making skills (Tarantino, 2017).

While community participatory research is more time-consuming and expensive than traditional scientific research, both the process and results are better scientifically in terms of community relevance (Burger et al., 2013). Learning inputs which are supporting this idea and which can be used to establish new science shops are, for instance, available in Tryon and Ross (2012) and Zimmerman et al. (2009). However, even though Science shops can support each other, models working in one country cannot simply be used in other countries but must be adapted (EC, 2003).

Experience, Participation, Outputs

In terms of reaching satisfaction of the involved parties in CBPR with its conduct, results, and subsequent desired (expected) community changes, the reviewed literature mostly provides indirect evidence. For example, regarding meeting of the end-user's needs in the area of public and environmental health, CBPR usually reaches a demonstration level intervention without follow-ups by governmental institutions to scale-up the findings to the national level. Such cases are described in Farmer et al. (2015) and Davison et al. (2008) stating that programmes to influence actions will be more effective if they are based on an understanding of the target audience's own perceptions and beliefs.

Hicks et al. report (2012) that through democratic participation in research, CBPR as a translational science can become a movement for social change desired by communities in promoting their own health. However, there are certain epistemic barriers which need to be taken into account, like different styles of thought, research traditions, techniques and language that are difficult to translate across disciplinary domains. Namazzi et al. (2013) furthermore demonstrate, that stakeholders could provide for the successful implementation of the sustainability scheme in three main ways: by contributing finances, by contributing non-monetary resources and by promoting research to policy influence.

Two studies report on challenges in conducting CBPR (Podesta et al, 2013; Popp, 2013). As a project evolves, diverging institutional incentives, tension between academic publication and outreach or policy-relevant outputs, disciplinary biases, and personality issues play increasingly important roles. The lack of consensus on criteria for assessment of results is often ranked as a major practical difficulty of this kind of research. Despite many efforts to describe and characterize collaborative research on complex problems, conditions for success (including the very definition of ''success'') remain to be rigorously grounded on actual cases. Toward this goal, authors argue that a self-reflective process to identify and intervene on factors that foster or impede cooperative production of knowledge should be an essential component of integrated assessments involving scientists, practitioners and stakeholders. The success of participatory (futures) research depends greatly on the professional attitude of researchers. To achieve this, the self-conception of researchers regarding their relation to practice should be explained in terms of philosophy of science. Furthermore, participatory (futures) researchers must involve themselves in the discourse of the scientific community. Podesta et al. (2013) provide good insight into barriers of participatory research and propose the following intervention measures achieving consensus on a common problem or topic for study, agreement on ways to work together across disciplines while retaining disciplinary rigor, the 'right' composition of the team, interactions among geographically disperse researchers, tension between academic publication and outreach or extension and diverse institutional incentives. Regarding evaluation of the success of PR

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the discussion is particularly useful in a long-run understanding of the concept of Science Shops. Additionally, this article calls for the attention to standard means for evaluating disciplinary research (i.e., number of publications, citations, successful research-grant proposals, teaching evaluations by students, benchmarking with other programs, awards and patents received) which may prove insufficient in PR and inter-disciplinary (IDR) settings. Because IDR is immersed in a particular context, it cannot be adequately evaluated on research outputs alone: instead, the quality of IDR depends on, and needs to be judged in relation to, the interplay between context, process and product.

Lavallee et al. (2012) provide further experience about best practices and evaluation: Incorporating rigorous evaluation and reporting of engagement activities will enable objective assessment of current strategies and ongoing improvement in engagement methodologies. As evaluation results become available over time, the community will learn valuable information about the impact of stakeholder engagement on the process and outcomes of research. Such findings will further advance the development and refinement of best practices for involving diverse stakeholders throughout the research continuum. Use of standard outcome measures of effective engagement such as respect, trust, legitimacy, fairness, competence is crucial.

Regarding students' experience with CBPR, the following is indicative (Rao et al., 2004): It is evident from the students' reports on their experiences during their time with the projects that not all of them have benefited equally from or were equally happy with the experience. Some told they had problems interacting with the community in the field; others did well in the field, but ran into problems handling the research itself. Some took initiative, while others were reluctant to proceeding without specific instructions. Students could be given more or less autonomy depending on how they proved and conducted themselves over the course of the project.

Some disagreements are also reported regarding communities' engagement in CBPR (Weiner and McDonald, 2013). Community partners emphasize that their primary goal is to create sustainable programs to improve the health of the community rather than to develop research expertise. Another recent experience argues (Wolfson et al., 2017) that there is a belief that participation in the study would help acquire additional financial support in the future, while on the other hand participants from the community experienced frustration or aggravation as a result of participation in the study. They indicated that there was a conflict between their job and the project work, saying that they were viewed negatively as a result of their association with the project. There are also cases where satisfaction is clearly achieved (Wright et al., 2017): the research has been successful in all areas that the respondents considered important. For example, identification of more profitable farming practices, good interaction with university research and improved farm profitability were rated as very important objectives and as successful by 80–100% of the respondents.

A clear and systematic overview of 10 years of experience of Amsterdam Science Shop (from 1977 to 1986) is provided in (Zaal and Leydersdorff, 1987) with statistically supported demonstration on how CBR influenced university research, and which were important success factors. Also, some frustrating factors are described in terms of preventing science shop investigations from having a greater effect on research.

The success of a CBPR initiative is not always captured with standard research methodologies. For best practice (lessons learnt), the following should be considered (Johnson-Shelton et al., 2015):

- Overlapping yet diverging goals of multiple communities in a CBPR partnership can lead to community capacity building,
- Partners' emergent activities can both stretch and enhance the project,

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- Schools and districts are naturally situated to participate in projects, but engagement and commitment of key personnel is essential,
- Participation of organizations grow and recede over time causing changes to core partnerships and influencing the direction of CBPR projects and
- Complex societal problems require CBPR approaches that necessitate significant coordination by researchers.

Longer-term impacts

Long-term impacts are least discussed in the literature or are an explicit subject of CBPR. What can be determined, however, are intuitions or impressions of the researchers and some stakeholders about the potential for future changes either in the research and education area or in the communities and the society as a whole, respectively. Some examples are given below.

Within the undertaken research (Dlouha and Pospisilova, 2017), results based both on expert knowledge and voices of actors and interest groups involved in education show that the outcome could be used in ESD – Education for Sustainable development (for example at the Labyrinth School, Brno, which is a part of the Open School Space project).

A historical overview of science shops, funding and organisational issues, and development towards the network of Living Knowledge is provided in Dorland and Jørgensen (2015). The Science Shop at DTU (Technical University of Denmark) is also described. It is closed now (since 2012), but the same research areas, methods and projects continue in the centre for Development, Innovation, and Sustainable Transition (DIST). This is an example, how a relatively short lifetime of a science shop can be extended under a different organisational form having longer impact on the society. The difference though is the lack of an open door with the consequence that the society doesn't know where can come and ask for help. There are also no formalized procedures nor funding for handling requests.

Research has shown that community groups do experience long-term benefits from service-learning, if it is conducted through careful negotiation to meet their needs. For individual students, service-learning can also increase their skills and employability and give them major benefits persisting long after graduation (Hall et al., 2004). Also, intervention on the process of building community capacity for dealing with asthma triggering factors can lead to health improvements in a longer timeframe (Parker et al., 2010).

For Inuit, systematic planning is a relatively new convention. Inuit adaptability has long been derived from an in-depth knowledge of the local environment and continual assessments and adjustments to present conditions. Adaptation planning related to climate change should be understood as the initiation of a practical and ongoing consideration that will shape actions through time (Pearce et al., 2012). In this context, a few publications deal with a development of new research areas being practiced through longer time-frames (Zaal and Leydesdorff, 1987), as well as conditions and capacities for building partnership of long duration (Reutter et al., 2005).

3.3.   Best practices on CBPR and Science Shops

Research publications, guides, handbooks, manuals, and project reports bring comprehensive overview and orientation about good practices on CBPR and science shops (Afzalan et al., 2017; Barreteau et al., 2010; Brodersen and Jorgensen, 2007; Davison et al., 2008; European Commission, 2003; Fischer et al., 2004; Gall et al., 2009; Israel et al., 1998 and 2005; Jorgensen, 2008; Lavallee et al., 2012; Leydersdorff and Ward, 2005; Minkler and Wallerstein, 2008; Minkler et al., 2012; PERARES, 2012, Sparks, 2016; Zimmerman et al., 2009). The emphasis is on community participation, which can involve a wide range of qualitative and quantitative methods and modes. Regardless of the particular methods used, what is unique about CBPR is the way in which the research is conceptualized and carried out. However, a challenge in this regard still remains to be transparent and fit-for-purpose evaluation of the process and effectiveness of the participation. In addition to community participation strong accent is placed on the use of findings to help bring a desired societal change.

The principles and desired features of CBPR and science shops' performance collected from the literature cited above are presented in Table 3 below. Every partnership wishing to undertake CBPR or establish and run a science shop should adapt these principles and features, or develop new ones, tailored to their unique context.

Principle/Desired feature	Description
Recognition of community as a unit of identity.	The principle emphasizes the significance of community for people, and the importance of using that identification as a starting point for the work.
Building on strengths and resources within the community.	This principle reminds that members of communities have a wealth of knowledge and lived experience from a cultural, local, and historical lens. This understanding can in turn provide important insider information that is typically unattainable by an outside scientific researcher.
Facilitating a collaborative, equitable partnership in all phases of research, involving an empowering and power-sharing process that attends to social inequalities.	A need to highlight the importance of shared accountability in the decision-making process, across all steps of the research process. Recognition of the inherent inequalities that exist between researchers and community partners. The importance of addressing these imbalances by building trusting and mutually respectful relationships grounded in an empowering process emphasizing communication, information sharing, and joint decision-making is stressed.
Fostering co-learning and capacity building among all partners.	Importance of fostering a reciprocal relationship that engages all parties in the exchange of knowledge, skills, and capacity, reminding that all partners bring a wealth of diverse experiences, skills, and perspectives to the partnership process.
Integrates and achieves a balance between knowledge generation and intervention for the mutual benefit of all partners.	Contributions needed from both the scientists, and community partners make partnership. The emphasis is on integrating knowledge gained through the partnership, in the advancement of interventions and policies that capture the concerns of all partners and the larger communities they serve.
Focusing on the local relevance of issues.	In CBPR partnerships, the multiple factors are examined through an interdisciplinary lens, and their interactions stressed, however reflecting concrete societal values and concerns.
System development using a cyclical and iterative process.	Partnerships are of iterative nature. It is important to revisit each stage of the research process as necessary. This ensures that all voices are captured and that the action agreed upon is appropriate for all partners involved.

Dissemination of results.	It is important to share findings in an accessible and respectful way with the community and other stakeholders at the local, state, and national levels.
A long-term process and commitment to sustainability.	Emphasis is on the importance of committment to the long haul through adequate investment of time and resources in the CBPR process. It is also important to keep a critical eye on sustainability and enforcement of the outcomes of the CBPR process.
Open addressing issues of minority, low-income, low-power, migrants, race, ethnicity, racism, and social class.	CBPR frequently brings together community partners from marginalized groups. To be effective in such situations, CBPR partners must work hard to embody cultural humility, recognizing that while no one can be truly competent in another's culture, a work to redress power imbalances and to develop authentic partnerships should be demonstrated.
Ensuring research rigor and validity but also seeking to broaden the bandwidth of validity with respect to research relevance.	To be sound and useful in helping promote policy change and other action outcomes the research dimension of CBPR must take seriously notions of research rigor, validity, and reliability, including community lay knowledge, perceptions and values.

Table 2: AN ILLUSTRATIVE LIST OF LITERATURE ITEMS PRIVIDING KEY MESSAGES FOR THE PROJECT

There are also multiple practical tools aiming to support different components of CBPR and good performing of science shops. The Living Knowledge Toolbox https://www.rri-tools.eu/-/science_shop_tools contains resources on science shop procedures, processes and guidelines and are designed to help science shops and people working in community-based research to develop professional standards and improve their practices. Some of the tools and methods are listed below.

Co-creation 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.

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

The 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.

The 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.

Setting up a participatory research agenda
https://www.rri-tools.eu/how-to-pa-public-engagement#menu-anchor-id2-content   provides an overview and links to examples of initiatives that have used participatory methodologies to define research agendas.

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The Engage Action Catalogue of engagement http://actioncatalogue.eu/ is a compendium of engagement methods and tools to help those wanting to conduct inclusive research. Examples of participatory methodologies that are particularly of relevance to science shops to use during the project definition stage are:

- **Charrette** (to generate consensus among diverse groups of people and form an action plan). http://actioncatalogue.eu/method/7420

- **Deliberative Polling®** (a multiple iteration survey method that enables anonymous, systematic refinement of expert opinion with the aim of arriving at a combined or consensual position) http://actioncatalogue.eu/method/7399

- **The World Café** (a method for generating and sharing idea by engaging groups, both within organisations and in the public sphere) http://actioncatalogue.eu/method/7402

- **Participatory Design** (co-design and practice-based research that can be done together with citizens concerned about a certain issue e.g. the environment) http://actioncatalogue.eu/met

- **Intake Question** (the Intake (a structured conversation) of a Question from a CSO transfers it into a Research Question) http://actioncatalogue.eu/method/7423

- **Future workshop** (a method for planning and forming a vision of the future in a specific geographical area. Can be used to define aims and identify problems by local stakeholders) http://actioncatalogue.eu/method/7391

- **Focus groups** (a qualitative method that is used to determine the preferences of people or to evaluate strategies and concepts). http://actioncatalogue.eu/method/7409

The SciShops.eu project additionally deals with the topic of best practices of CBPR and science shops in Task 2.2, where interviews with responsible staff of fifteen science shops have been made (see D2.2 for details). The science shops interviewed are from Europe, Australia and Canada. In terms of impacts, success, challenges and future developments of science shops an overview through the period of the last 15 years is provided. It describes experiences, status, good and less effective practices and contains a set of good practice case studies to inform the future development of the SciShops project as well as serve as inspiration to others setting up new science shops. The case studies investigate a number of aspects about the organisations themselves, such as their business models, how they are funded and managed, as well as RRI practices they perform.

4 Synthesis and key messages for SciShops.eu

The synthesis and key messages provide an overview on the characteristics, challenges, impacts, and best practice of CBPR. A special emphasis is given to the evaluation, funding, and sustainability of science shops, since these three issues – according to the information in the literature reviewed - became ever more relevant through time. Future work on the SciShops.eu project should therefore pay special attention to these three issues. The summary given below is supplemented by the Appendix 6.3.

The literature review confirmed established and well-known beneficial key attributes of the CBPR: it is a desirable way of making science and research with and for society. Despite such clear recognition and its demonstration for almost 50 years now, there are still obstacles in CBPR's implementation, particularly regarding funding, stable organisation and sustainability. There is also a shift from the initial concept recognized, i.e. that a researcher or research team approaches a community to undertake research on a topic the investigators perceive as a challenge for the community, instead of the community being an initiator for the research driven by its own perception and experience. These are the issues in all parts of the world. For example, long-term partnerships among stakeholders suffer from misunderstandings of the issues/needs to be solved, unstable political support, lack of systematic, continuous education and knowledge transfer from academia to low power citizens (Pearce et al., 2012). Further, funds are in majority available only for the period of demonstration projects (Flicker et al., 2009; Hicks et al., 2012; Jorgensen, 2007; Sclove et al., 1998).

Funding issue seems to be permanent and most difficult. It directly influences sustainability of science shops (sustainability rests on funding, enthusiasm of the involved parties, mutual trust and help). The consequence of low or no funding is that a number of science shops established during 70ies, 80ies, and 90ies ceased their activity or changed the form of operation. The »living« ones, however, are dependent on project funding rather than continuous institutional support, or, being attached to the university or other educational or research institution, provide participatory services/research using the mother's institution budget. In these, students and faculty form the key research staff in CBPR. Managers of the new science shops should therefore consider recommendations provided by the experienced ones until stable funding is acheived.

Regarding evaluation, recommendations are directed towards more integral evaluation practices (instead of partial performed so far, for example isolated evaluation of the training workshops, communication activities, publications, completed projects, students engaged, etc.), while a community see the success through their active involvement and empowerment which brings concrete improvemens and changes in their community. Reserchers' views and interests should be supplemented by the views and interests of the stakeholders involved in the research. In this context the evaluation process should be integral part of the research and should cover all phases from planning, over execution, to use of results. Different indicators and measurements are to be used in each of the research phases, e.g. respect, trust, legitimacy, fairness, competence and accountability in the phase of planning and execution, the research process should be evaluated in terms of fit-for-purpose and effectiveness, while the outcomes should be checked in terms of goals achievement and meeting of the expectations of the research participants. *Ex-post* evaluation should cover follow-up of the implementation of research results in terms of monitoring the expected changes in the society. In this view an update and specific tailoring of available evaluation tools, e.g. PERARES toolkit, could be used for those who plan to establish new science shop in the framework of the SciShops.eu project. In this context it is also relevant to re-consider peer reviewing of collaborative research, and quality

monitoring of its performance. As Street et al. (2007) argue, the Cooperative Research Centre for Aboriginal Health (CRCAH) reviewed its research development and funding processes; proposals developed by project proponents have been subjected to a quality assurance process in which research 'peers', community members, practitioners and policy makers assessed proposals against agreed properties (such as rigour, benefit, feasibility, value for money, capacity building and collaborative potential). Such an approach could be applied in the forthcoming period of existing and new science shops and related CBPR established in the framework of SciShops.eu project.

The guides for conducting CBPR and establishing science shops (NEF, 1998; NIEHS, 2000; Teodosiu, 2005; Shallwani and Mohammed, 2007; Sparks, 2016; O'Mahony et al., 2013, Steinhaus et al., 2013) should be considered in future work of the SciShops.eu project, since they cover organisational, financial, and topical issues. The challenges with CBPR and science shops discussed in the reviewed literature (Banks et al., 2013; Weiner and McDonald, 2013; Wolfson et al., 2017) should also be an important topic in the process of planning new science shops; the experienced partners in this area are expected to help the new ones. Together they may provide specific recommendations for avoiding barriers in reaching at least initial success of the new science shops. Additionally, it is important that the leaders of new science shops keep record of the activities they perform and evaluate accomplishment of both general and specific goals, e.g. the effectiveness of the activities and their fitness-for-purpose. Later on, these records will become an invaluable source of information for process evaluation of establishing a science shop and a basis for more objective expectations regarding overall success of a concrete science shop and CBPR in general.

The literature reviewed extensively discuss the issue of participation. Caution is raised regarding a term "engagement", which may not reflect the true form of public participation in science (Rodríguez, 2011). Gathering the public and members of the scientific community does not automatically mean the engagement of citizens with science in agreement with the most relevant dimensions to deal with the issue. Provided that science shops release annual statistics or reflect on their past projects, the multidimensional concept of engagement may be analyzed in order to know what kind of participative conditions are offered. This would turn abstract concepts like 'participation' or 'engagement' into more pragmatic and manageable ideas.

With regard to best practices of CBPR and science shops it is difficult to justify any kind of selection or prioritisation without prior agreed (i.e. widely approved) methods on how to do so. Namely, the results of such prioritisation would always sound contextual and goals directed, so they may be judged as subjective and biased. Also, selective referencing of the research articles and other publications may be a subject of criticism. Therefore, in addition to the selection of the key messages in Table 3 (see Appendix 6.3, Weiner and McDonald, 2013; Lavallee et al., 2012; Minkler et al., 2012) the following may be used as an orientation about important components of, and recommendations for, trustworthy approach to CBPR and good practice of science shops: *build and maintain an effective CBPR partnership; build on community, academic, and other partners' strengths in studying and addressing shared concerns; use approaches and processes that reflect local community culture and ways of doing things—even if it slows down the process; use forms of data collection that can provide both the "Stories and Statistics" needed to help effect policy change; demystify the policymaking process: trainings and other tools can help the partnership better understand and navigate the policy process; also engage children and youth in CBPR; take advantage of new technologies to document, study, and effect change; communities can work together on higher levels (e.g. regional, national) on efforts to improve health, the environment, and other societal issues*.

Due to the poor coverage of mode of operation in the reviewed literature the SciShops.eu project should put more emphasis on the distinction between CBPR as a concept, and science shops as a mode of its implementation. In this context consideration and efforts should be made on whom to identify as a target when asking for support for the first, and whom for the second. For example, community administration could provide for the successful promoting of research to policy influence on one side, while industry could support – in monetary and non-monetary terms - concrete science shops (or other modes of implementing CBPR). By this disctinction clearer modes of operation of science shops could be developed and recognised.

Among lessons learned through CBPR the following topics deserve permanent consideration: contextual evaluating of CBPR, honoring each other, capacity developement, role of advocacy with a strong community partner, working to overcome historical trust issues within community research partnerships, the language of community benefit, and challenges of funding. All may be helpful to partnerships, funders, and consumers of CBPR.

5   Concluding remarks

Results of the literature review are as expected: There is a lot of knowledge and experience available throughout the world, however, needs, beliefs and endeavors for further improvement of CBPR and science shops are still present. Researchers expect help from, and effective engagement of, the high-level decision-makers (ministries, governments, funding agencies) in terms of supporting and expanding CBPR by more systematic and stable funding, while the communities (citizens) need assistance in capacity building both from researchers and their local representatives. They also expect tangible support in making changes based on research evidence. A gap between the two should be a subject of resolution through future targeted research, i.e. science shops or other forms of CBPR. Many recent studies confirm this.

Application of the idea and concept of participatory research in different countries brought specificities about its understanding and performance. This is visible through various interpretations of participatory research which is captured in the glossary and definitions at the beginning of this report. However, cultural characteristics, societal values, availability of resources (funding, man-power, skills, motivation, political support, etc.), general scope and affordability of research were, and still are, the factors which dictate CBPR throughout the world. For example, different types of science shops - these are generally understood as an established mode of CBPR - have been developed in different EU regions: Nordic, Southern Europe, Western Europe, and Central-Eastern Europe, as well as non-European. These regions have different levels of development of civil societies or science-society communication - e.g. the Central-East European region has weaker civil societies and a lack of research questions from communities for science shops compared to Western Europe - which contributed to different scope of participation in the framework of CBPR. Similarly, more policy action-oriented research in the public health arena, especially in the US, has developed modes of participatory research emphasizing their interests and perceptions.

The challenges for future decade of CBPR and science shops remain to be funding and transparent insight into their overall benefit based on integrated evaluation of the research process and its results commonly performed by all stakeholders involved in the research.

6   Appendices

6.1. Approach to literature search

The following two sets of keywords were applied in the Boolean search strategy:

Level 1 keywords aiming to identify literature items discussing core topics of the research: science shop; community-based research; participatory research.

Level 2 keywords aiming to identify literature items discussing characteristics and impacts of science shops/community-based research/participatory research: student/citizen involvement; community research activities; stakeholder; environment; research questions; (survey) capacity building; target group; interest group; citizen science/research; budgets; characteristics; success stories/projects; responsible research; positive impact on community; case studies; integrative planning; community engagement in research; success factors.

Several strings of keywords have been tested in terms of getting adequate number of hits (see below three examples); the process was concluded with the string providing 91 hits. Among these 6 were non-accessible so the final list included 85 of the literature items.

RESULTS INCLUDING LEVEL1 KEY WORDS:

TITLE-ABS-KEY (*"science shop"* OR *"community-based research"* OR *"participatory research"*)

Number of results: 9,370

https://www.scopus.com/results/results.uri?numberOfFields=0&src=s&clickedLink=&edit=&editSave
Search=&origin=searchbasic&authorTab=&affiliationTab=&advancedTab=&scint=1&menu=search&t
ablin=&searchterm1=%22science+shop%22++or++%22community-
based+research%22++or++%22participatory+research%22&field1=TITLE_ABS_KEY&dateType=Public
ation_Date_Type&yearFrom=Before+1960&yearTo=Present&loadDate=7&documenttype=All&resetF
ormLink=&st1=%22science+shop%22++or++%22community-
based+research%22++or++%22participatory+research%22&st2=&sot=b&sdt=b&sl=91&s=TITLE-ABS-
KEY%28%22science+shop%22++or++%22community-
based+research%22++or++%22participatory+research%22%29&sid=9fa7336de2208d65cb30c713389
9441a&searchId=9fa7336de2208d65cb30c7133899441a&txGid=931173360869457dcde233411c94d
6e2&sort=plf-f&originationType=b&rr=

RESULTS INCLUDING LEVEL 1 AND LEVEL2 KEY WORDS:

(TITLE-ABS-KEY (*"science   shop"* OR   *"community-based   research"*   OR   *"participatory research"*)   AND   TITLE-ABS-KEY (*"citizen   involvement"* OR   *"stakeholder"*))   AND ((*research* AND *questions*) OR (*"satisfaction"* OR *"success"*) OR (*capacity* AND *building*))

Number of results: 395

https://www.scopus.com/results/results.uri?sort=plf-
f&src=s&sid=5dfe1e4d7081600417a0a78601f3aa13&sot=a&sdt=a&sl=230&s=%28TITLE-ABS-
KEY%28%22science+shop%22+or+%22community-
based+research%22+or+%22participatory+research%22%29+AND+TITLE-ABS-

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KEY%28%22citizen+involvement%22+or+%22stakeholder%22%29%29+and+%28%28research+questi
ons%29+OR+%28%22satisfaction%22+or+%22success%22%29+OR+%28capacity+building%29%29&o
rigin=searchadvanced&editSaveSearch=&txGid=e255758f26a183ab84bed555d7820674

RESULTS INCLUDING LEVEL 1 AND LEVEL2 KEY WORDS - APPLIED

(TITLE-ABS-KEY („science shop" OR "community based research" OR "participatory research") AND
TITLE-ABS

KEY ("citizen" OR "student" OR "stakeholder" AND "involvement")) AND ((research AND ques
tions) OR (capacity AND building) OR ("satisfaction" OR "success"))

 Number of results: 91

https://www.scopus.com/results/results.uri?sort=plf-
f&src=s&sid=86eee5a514d645df17ca8b99dae73c1a&sot=a&sdt=a&sl=249&s=%28TITLE-ABS-
KEY%28%22science+shop%22+or+%22community+based+research%22+or+%22participatory+resear
ch%22%29+AND+TITLE-ABS-
KEY%28%22citizen%22+or+%22student%22+or+%22stakeholder%22+and+%22involvement%22%29
%29+and+%28%28research+questions%29+OR+%28capacity+building%29+OR+%22satisfaction%
22+or+%22success%22%29%29&origin=searchadvanced&editSaveSearch=&txGid=a0cc0ddc9a7e755
f87b3abba1dc15fc3#

6.2. Literature Read Table

The Excel Table showing all the literature items selected and reviewed is available at https://docs.google.com/spreadsheets/d/1UiGx0zHXx3Y0wABHGbTJfaDpVxMDN3b98IKdpZOj18/edit#gid=628899306

The literature includes research articles, project reports, books, presentations, policy documents, manuals, guides, factsheets, infographs, and case-studies. It is important to note, however, that not all of the items were fully informative in terms of data we were searching for, i.e. characteristics and impacts of CBPR, science shops in particular. Only a small number of literature items was found, which explicitly provided all of this information. This was a shortcoming of the search results. Consequently, there are a lot of "N/A" (or similar) signs in the table indicating that a particular information was not available in the reviewed literature items. These items were excluded from the qualitative synthesis evaluation; in total there were 110 items, in which the information on characteristics and impacts of CBPR was explicit, or it was possible to extract it from the text implicitly, i.e. by reasoning and induction.

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6.3. Illustrative list of key messages for the project

The literature items listed in Table 3 below are available at https://drive.google.com/drive/folders/0Bx4Uzkj2OV2rVmxrQV9PYzZucGc. The list is organised in a descending order by year of publication to indicate permanent actuality of the CBPR/science shops features through the last 20 years.

Authors/Institution	Title	Year	Key messages
FSD – Foundation for Sustainable Development	Community-Based Participatory Research Toolkit (Guide)	2017	The guide includes a concrete checklist of conditions for successful CBPR work. Can be used for creating science shops.
Sparks	Sparks Handbook A guideline of innovative formats for participatory activities (Guide)	2016	Detailed practical guide on performing RRI activities, including Science Shops. Useful.
Pandi-Perumal S.R., Akhter S., Zizi F., Jean-Louis G., Ramasubramanian C., Edward Freeman R., Narasimhan M.	Project stakeholder management in the clinical research environment: How to do it right	2015	Stakeholder participation can (a) improve relevance; (b) promote visibility and research transparency; (c) accelerate and translate the research findings to real-world challenges; (d) enhance greater project acceptance as confidence derived in the decisions made during the project's milestone developments. Similarly, the project's final outcome can only be considered successful when it is acknowledged by its key stakeholders.
Mulder, H. A. J. (Ed.)	Supporting new Science Shops: Report describing the implementation phase of the local Public Engagement with Research action plans, mentoring and advisory activities, and Summer Schools (PERARES; No. D4.2)	2014	To start a new Science Shop, the following approach is to be taken: 1. Appointment of a staff member to do a feasibility study and make a business plan, dealing with following elements and strengths/weaknesses of various options: a) The potential demand (topics, numbers) for research from CSOs. b) The potential resource of student-researchers (disciplines, levels, numbers) c) Options for organisational placement of the Science Shop, staffing, workflows and responsibilities d) Potential sources for continued funding 2. Set up of an advisory board (including both research and CSO representatives) 3. Set up a temporary structure to solicit and respond to research questions 4. Design of pilot projects.

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Munck, R., McIlrath, L., Hall, B., Tandon, R. (Eds.)	Higher Education and Community-Based Research Creating a Global Vision (Book)	2014	Good recent overview on mobilizing CBPR and its inclusion in higher education
Center for Design, Innovation and Sustainable Transitions Aalborg University Copenhagen	6th Living Knowledge Conference (Proceedings)	2014	Project's final outcome can only be considered successful when it is acknowledged by its key stakeholders.
University College Cork	CARL Manual (Guide)	2014	Useful reference point for new Science Shops
Podestá G.P., Natenzon C.E., Hidalgo C., Ruiz Toranzo F.	Interdisciplinary production of knowledge with participation of stakeholders: A case study of a collaborative project on climate variability, human decisions and agricultural ecosystems in the Argentine Pampas	2013	Good insight into barriers of participatory research. Regarding evaluation of the success of PR the discussion is particularly useful in a long-run understanding of the concept of Science Shops.
Weiner, J., McDonald, J.A.	Three Models of Community-Based Participatory Research	2013	CBPR can be unfamiliar territory to academic investigators and community organizations alike. CBPR investigators at the Pennsylvania University and community leaders have been interviewed to ascertain best practices in CBPR and to compare academic and community perspectives. A number of models of community-academic partnerships emerged, each with its own advantages and disadvantages. The perspectives of the investigators sometimes matched those of the community leaders, but diverged in important ways.
Lavallee D.C., Williams C.J., Tambor E.S., Deverka P.A.	Stakeholder engagement in comparative effectiveness research:	2012	As evaluations become a routine part of stakeholder engagement processes, the framework will have to be refined and the evaluation process adapted to meet the needs of stakeholder participation in community engagement research (CER). Incorporating rigorous evaluation and

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	How will we measure success?		reporting of engagement activities will enable objective assessment of current strategies and ongoing improvement in engagement methodologies. As results become available over the next few years, the CER community will learn valuable information about the impact of stakeholder engagement on the process and outcomes of healthcare research. Such findings will further advance the development and refinement of best practices for involving diverse stakeholders throughout the research continuum. Use of standard outcome measures of effective engagement such as these six meta-criteria - respect, trust, legitimacy, fairness, competence and accountability - should help accelerate this process.
McKinley D.C., Briggs R.D., Bartuska A.M.	When peer-reviewed publications are not enough! Delivering science for natural resource management	2012	Detailed historic view on the development of public interest and engagement in natural resources management; comparison of models and characteristics of conventional research, citizens science and PR - start with Aldo Leopold's "Land ethic". Importance of other than peer-reviewed evaluation of science results, i.e. public's evaluation of research.
Minkler M., Garcia A. P., Rubin V., Wallerstein N.	Community-Based Participatory Research: A Strategy for Building Healthy Communities and Promoting Health through Policy Change	2012	The report combines lessons and best practices from around the country with insights drawn from six case studies set in California. Background and context are provided, along with promising practices and sample resources and tools to assist local leaders in planning their own CBPR-inspired projects.
Tryon, E., Ross, J.A.	A Community University Exchange Project Modeled After Europe's Science Shops	2012	Learning inputs for those establishing new Science Shops
Mulder, H. A. J.; De Bal, I.; Steinhaus, N.	Introduction to Science Shops (Presentation)	2011	Recommended reading for "Getting acquinted with Science Shops"
University of Victoria	Why CBR Matters (Factsheet)	2011	A good reference point for definitions of CBPR and Science Shops

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Gall, E., Millot, G., Neubauer, C.	Participation of Civil Society Organisations in Research (Report)	2009	A general aspect is the high productivity of such projects, both in terms of concrete outputs (deliverables), and in terms of less tangible outcomes (e.g. empowerment of communities). By the variety of the outcomes, and their relevance for different partners, Participatory Research is deemed "highly productive", "cost-efficient" and "good value for money".
Jongstra, H.	Engaging students in Community Based Research (Report)	2009	Recommendations for the improvement of the recruitment strategies of student researchers.
Zimmerman, S. et al.	Manual for Community Based Participatory Research (Guide)	2009	Useful guide for those who intend to establish a new Science Shop (i.e. to run CBPR)
European Commission	Science Shops Knowledge for the community (Factsheet)	2003	Science shops can support each other; Models working in one country cannot simply be used in other countries but must be adapted
National Institute of Environmental Health Sciences	Successful Models of Community-Based Participatory Research (Report)	2000	The report provides overview on: Overall Benefits of CBPR, Benefits to Schools of Public Health, Benefits to State and local Health Departments, Benefits to Public and Private Funding Institutions. In addition to outlining benefits of CBPR, the Conclusions and Recommendations section highlights challenges facing CBPR and offers possible solutions to overcome them. Three principal challenges identified by participants included: development of university-community partnerships, institutional commitment, and training.
New Economics Foundation	21 techniques of community participation for the 21st century (Report)	1998	A guide on participation and techniques for its practicing. Produced in 1998 (20-years old), however still useful!

Table 3: AN ILLUSTRATIVE LIST OF LITERATURE ITEMS PRIVIDING KEY MESSAGES FOR THE PROJECT

6.4.   Examples of the description of impacts of CBPR

In Table 4 a description of impacts for five reviewed literature items are summarised. They illustrate different levels of comprehensiveness and extent of the description. Different intensity of the blue color guides interesed readers to those literature items, which are more (or less) informative in terms of impact description. The blue color in the Literature Read Table (see Appendix 6.2) has the same meaning.

LEGEND: Extent of description of the impacts of CBPR (the legend has been taken from the Literature Review Guide, see Appendix 6.5)

	Impact mentioned, but not discussed
	Impact discussed, however without clear justification
	Data provided & the impact of CBPR clearly described

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Authors	Title	Type of literature	Year	Impact mentioned	Impact discussed	Impact clearly described (data provided)
Parker E.A., Chung L.K., Israel B.A., Reyes A., Wilkins D.	Community organizing network for environmental health: Using a community health development approach to increase community capacity around reduction of environmental triggers	Article	2010	Intervention on the process of building community capacity for dealing with asthma triggering factors can lead to health improvements in longer timeframes.	Results suggest that the use of a CBPR approach to community health development can contribute positively to the enhancement of community capacity. This, in turn, can lead to the reduction of environmental hazards and improved health of community residents.	In terms of capacity building with CBPR one should develop and maintain leadership, participation, skills, resources, social and organisational networks, sense of community, community power, community values, critical reflection.
Pearce T., Ford J.D., Caron A., Kudlak B.P.	Climate change adaptation planning in remote, resource-dependent communities: An Arctic example	Article	2012	N.B.: All impacts are clearly described		For Inuit, systematic planning is a relatively new convention. Inuit adaptability has long been derived from an in-depth knowledge of the local environment and continual assessments and adjustments to present conditions. The tendency to deal with the immediate can be a challenge when it comes to committing to future courses of action and long-term planning. It is helpful in this regard to maintain a flexible, even *ad-hoc* approach to climate change adaptation planning in Inuit communities. In these ways, adaptation planning should be understood as the initiation of a practical and ongoing conversation that will shape actions through time.

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Reutter L., Stewart M.J., Raine K., Williamson D.L., Latournoau N., McFall S.	Partnerships and participation in conducting poverty-related health research	Article	2005	N/A	Capacity building and equal treatment of all partners ensures long duration of partnership	N/A
Street J., Baum F., Anderson I.	Developing a collaborative research system for Aboriginal health	Article	2007	In terms of processes and relations the promotion of collaborative partnerships may provide a better platform for investigator-initiated research projects in Aboriginal health. There is both need and potential for further research and discussion on the impact of current research funding systems on research in this context.	Melding the skills of all parties enhances the research and its potential for transfer. Inclusion of service providers and community-controlled organisations broadens the review process into 'merit' review and helps to establish credibility of the research in the service-delivery arena while ensuring appropriate community engagement takes place. Training or mentoring must support participants in the program-building process and it is important that academic researchers make difficult technical issues such as statistical analyses and qualitative techniques clear so that informed decisions can be made.	Ideas to reconsider funding of participatory research. Also relevant reference for re-considering peer reviewing of collaborative research, and quality monitoring of its perforormance.

| Wolfson M., Wagoner K.G., Rhodes S.D., Egan K.L., Sparks M., Ellerbee D., Song E.Y., Debinski B., Terrillion A., Vining J., Yang E. | Coproduction of Research Questions and Research Evidence in Public Health: The Study to Prevent Teen Drinking Parties | Article | 2017 | Indications about possible beneficial coalitions among stakeholders. | Effective strategies development and their implementation based on acquisition of knowledge about dealing with societal issue (underage drinking). There is a belief that participation in the study would help acquire additional financial support in the future, while on the other hand participants from the community experienced frustration or aggravation as a result of participation in the study. They indicated that there was a conflict between their job and the project work, saying that they were viewed negatively as a result of their association with the project. | Feasibility and effectiveness of CBPR could still be improved; dual emphasis, from funders and other sources, along with genuine engagement with a variety of stakeholders, including policy makers, community members and institutions, patients, and their families should be made. |

Table 4: EXTRACTION FROM THE REVIEWED LITERATURE: EXTENT AND SPECIFIC TOPICS OF THE IMPACTS OF CBPR

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6.5. Guide on literature review

A guide on literature review has been prepared with the aim to ensure both uniformity of the review process and recording of findings by all involved parties. The draft guide has been discussed among partners involved in Task 2.1 and after two revisions agreed and uploaded on the shared space of the project in folder WP2. Below is extraction of the content of the guide.

This document is to be used with Excel spreadsheet "Literature read" (located in WP2, D2.1 folder). It provides information on how to review the literature and record extracted information in the most effective way, so making the whole process fit for purpose.

The process consists of the following four main steps:

- First, open the Literature read spreadsheet and check the first column (named Reading status…). From available "blanks" choose a literature you wish to read;
- Second, go to "Library" folder (located at 030>> SciShops.eu) and download your chosen literature (the literature is sorted alphabetically);
- Third, go back to the Literature Read spreadsheet and indicate in the first column that the literature you've chosen is in the process of reading;
- Fourth, extract information and fill-in the Literature read spreadsheet accordingly. Further info on this step is given below - specifically for each column of the spreadsheet.

Reading status: Read by Partner/In the process of reading/To be read (blank)

Name of the partner who has read selected literature and extracted the information (important for potential questions by the others)/Indication that selected literature is in the process of reading to avoid duplication/Blank cell means that a certain literature is available for reading. Please keep this information up-to-date, especially do not forget to indicate that a certain literature is in the process of reading immediately after it is taken for reading - see example, row 214!

Category of resource (Article, Case Study, Statistics, Report...): What kind of resource is it? An article, research report, case study, statistics….

Authors: Authors of the resource

Title: Title of the resource

Year: Year of publication

Summary: Exec. summary of the resource

Category of institution: What kind of institution is it about? A science shop, CBPR...

Name of research institution: Name of entity ("Entity" is the generic term for the institution (the science shop/CBR facility...). E.g. for the science shop "Liverpool Interchange" (https://www.liverpool.ac.uk/interchange/) the entity is "Liverpool Interchange")

Stakeholder: **Mother Organization:** Who is the organizer of the entity?

Stakeholder: Sponsors: Who funds it?

Stakeholder: Participants: Who are the stakeholders besides the organizer? Local authorities, citizens….

Country: Mother Organization: Where is the entity located/hosted?

Country: Participants: From which countries are the other stakeholders?

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Country: Recipients: Which country are the recipients of the research? E.g. a European-based entity researching solutions for poverty solutions in Africa.

Country: Research Question: To which region is the research about?

Topic: What research field and specific topic is the research about?

Scope: What does the entity want to achieve? General research, concrete problem solutions...

Mode of Operation: How is the entity organized? Online, science cafe….

Funding: How is it funded? By the mother organization, business model….

Link: Where can more information on the entity be found (e.g. project website)

Processes and relations: extract info on the awareness of CBR, relations between academics and CSO, influence on the direction of further research in the subject area, increase of client's knowledge of how research is done, etc.

Utility: extract info from a document on the increase of capacity to apply research results in a societal context, whether and how capacity to participate in research has been increased or evolved, whether research area has been strengthened, etc.

Experience, Participation, Outputs: put attention on demonstration and approval on the success, satisfaction, usefulness, development of research questions, etc., particularly about participants' overall satisfaction, meeting of the end-user's needs, development of common ideas, development of a common understanding of the problem area, efficiency of partnership, usefulness to a wider public than the immediate client, students' motivation and commitment, relevance to academic research (publications, appearances or contributions in public media, requests for advice on policy or legal issues relating to the project topic)

Longer-term impacts: raise of societal awareness of the issue, development of new research collaborations, reinforcement of existing research collaborations, development of new research areas and curriculums, establishment of new research centres, stronger collaboration with industry, etc.

Synthesis, Key messages: What can we take away for the project work of SciShops.eu, for example direct inputs to T2.2 Case studies (which case studies described in the literature deserve attention and further consideration), T2.3 Survey (which questions are relevant and should be asked), T2.5 Impacts (which impacts of CBPR should be further considered), best practices and strategies, recommendations related to establishing new Science Shops (WP6), etc.

<u>Note</u>: For presenting the extent of impacts described in the literature - in addition to text inserted under columns **Processes and relations; Utility; Experience, Participation, Outputs; Longer-term impacts -** one may use the following legend (see an example in row 209 of the Literature read spreadsheet).

	Impact mentioned, but not discussed
	Impact discussed, however without clear justification
	Data provided & the impact of CBPR clearly described

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7 Literature

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