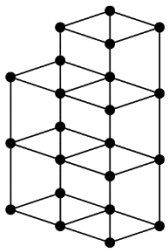

doing it together science

Grant agreement no. 709443

DITOs

Doing It Together science

Coordination & Support Action

D2.1 Outreach Plan for Environmental Sustainability

Work Package: 2

Due date of deliverable: Month 6

Actual submission date: 30.11.2016

Start date of project: June 01 2016 Duration: 36 months

Lead beneficiary for this deliverable: José María Blanco, Laura Fernández (MP)

Contributors: Imane Baïz (UPD), Cindy Regalado, Christian Nold (UCL), Carole Paleco (RBINS), Gaia Agnello (ECSA), Simon Gmajner (KI), Pawel Wyszomirski (Meritum), Bruno Strasser (UNIGE)

Reviewer: Paweł Wyszomirski (Meritum), Shannon Dosemagen (Public Lab)

Project co-funded by the European Commission within the H2020 Programme (2014-2020)		
PU	Public	**X**
CO	Confidential, only for members of the consortium (including the Commission Services)	
EU-RES	Classified Information: RESTREINT UE (Commission Decision 2005/444/EC)	
EU-CON	Classified Information: CONFIDENTIEL UE (Commission Decision 2005/444/EC)	
EU-SEC	EU-SEC Classified Information: SECRET UE (Commission Decision 2005/444/EC)	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant

agreement No 70944

Disclaimer

The content of this deliverable does not reflect the official opinion of the European Union. Responsibility for the information and views expressed herein lies entirely with the author(s).

All 'Doing It Together science' (DITOs) consortium members are also committed to publish accurate and up to date information and take the greatest care to do so. However, the DITOs consortium members cannot accept liability for any inaccuracies or omissions nor do they accept liability for any direct, indirect, special, consequential or other losses or damages of any kind arising out of the use of this information.

Copyright Notice

Acknowledgement

The DITOs project has received funding from the European Union Horizon 2020 programme under grant number 709443.

Reference

Please cite this work as:

DITOs Consortium, 2016. *Doing It Together science: Outreach plan for Environmental Sustainability.* UCL, London.

Document Identification Sheet

Project ref. no.	709443
Project acronym	DITOs
Project full title	Doing It Together Science
Document name	DITOs-D2.1-20161130.pdf
Security (distribution level)	Public
Contractual date of delivery	Month 6, 30.11.2016
Actual date of delivery	30.11.2016
Deliverable number	D2.1
Deliverable name	Outreach Plan for Environmental Monitoring
Type	Report
Status & version	Version 1.0
Number of pages	44
WP / Task (responsible)	WP2 / T1 (MP)
Author(s)	MP: José María Blanco, Laura Fernández
Other contributors	UPD: Imane Baïz Meritum: Paweł Wyszomirski ECSA: Gaia Agnello RBINS: Carole Paleco KI: Simon Gmajner UNIGE: Bruno Strasser UCL: Cindy Regalado, Christian Nold
Project Officer	Colombe Warin
Abstract	This deliverable is a compilation of initial guidance for the implementation of public engagement activities in the area of environmental sustainability including good practices, methods and approaches deployed by partners.
Keywords	Citizen science, DITOs, environmental sustainability, public events, methodologies, engagement
Sent to peer reviewer	3.11.2016
Peer review completed	15.11.2016
Supervisory Board approval version 1.0	6.11.2016

Table of contents

Index of figures

Index of tables

1 Version Log

Version	Date	Released by	Nature of Change
Draft	19/10/2016	José María Blanco (MP), Laura Fernández (MP)	First edition of the document
Review	24/10/2016	Pawel Wyszomirski (Meritum)	Consortium Review;
Review	15/11/2016	Shannon Dosemagen	Advisory Board Review
1.0	06/11/2016	Consortium	Formal Release

2 Definitions and Acronyms

Acronyms	Definitions
BD	Biodesign
CS	Citizen Science
CSA	Coordination and Support Action
DIT	Doing It Together
DITOs	Doing It Together science
DIY	Do It Yourself
EC	European Commission
ECSA	European Citizen Science Association / Verein der Europäischen Bürgerwissenschaften
ES	Environmental Sustainability
eutema	EUTEMA GMBH
H2020	Horizon 2020 Programme
KI	Kersnikova Institute
KPI	Key Performance Indicator
Meritum	Centrum Szkolen I Rozwoju Osobistego Meritum
MP	Medialab Prado, Madrid
RBINS	Institut Royal des Sciences Naturelles de Belgique
RRI	Responsible Research and Innovation
SC	Science Cafe
Tekiu	Tekiu Limited
UCL	University College London
UNIGE	Universite de Geneve
UPD	Universite Paris Descartes
WS	Waag Society

3 Executive summary

This report covers the environmental sustainability events of DITOs. It outlines the methodology used to formulate the outreach plan for environmental sustainability using a survey and online conversations with the partner organisations. It covers 19 activities that have taken place from 7 partners organised in 5 categories: exhibitions, seminar, science cafes, workshops and online competitions. These activities are analysed to identify good practice procedures such as: having professional cultural mediators guiding participants; keeping events open; using free and open licenses for documentation and outcomes; promoting groups to work in common projects; and improving feedback via personal interviews and ethnographic methodologies.

During the analysis of the survey a series of questions arose: how to best acknowledge the contribution of the participants? What is the best way to report the experiences of the partner organisations, so that they can be useful for others? What is the best way to connect with policy and decision makers to establish citizen science and improve environmental sustainability across Europe? The proposed contribution to these questions is an information sheet that will engage both the general public and activity organisers. The front page shows practical information for the public, while the back page will show the 'behind the scenes' information that is relevant for event organisers.

The Outreach Plan for Environmental Sustainability is Deliverable 2.1 (D2.1) from the coordination and support action (CSA) Doing It Together science (DITOs), grant agreement 709443.

4 Introduction

The project 'Doing-It-Together Science', DITOs, represents a step change in European public engagement with science and innovation. It aims to elevate public engagement with science across Europe from passive engagement into an active one. The project will support and build upon DIY, grassroots, and frugal innovation initiatives so that in the short and medium term it sustains, builds and promotes and in the long term increases the effects of these grassroots efforts channels to policy makers [1].

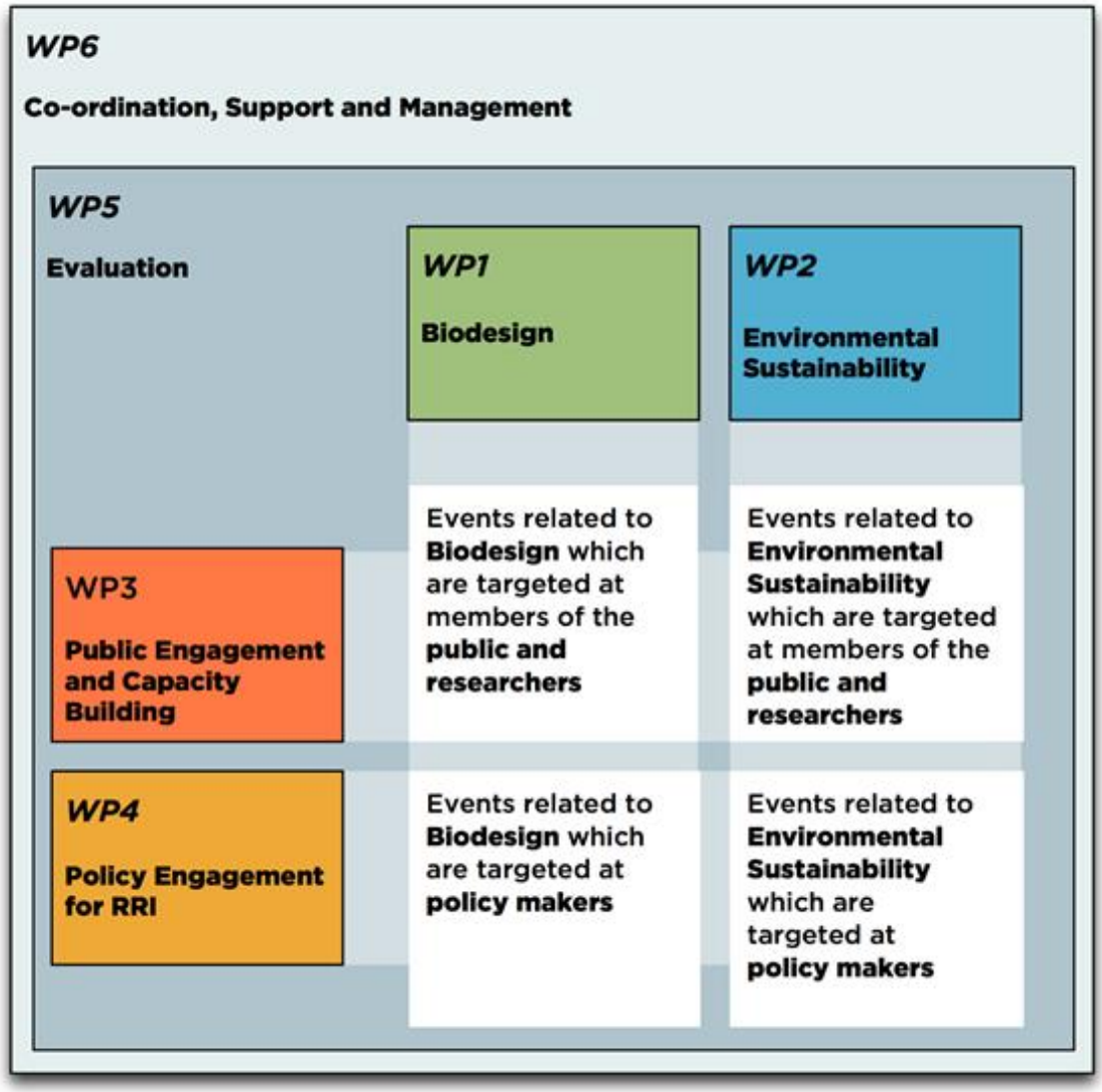

Figure 1: Relationships between work packages

MP leads WP2 Environmental Sustainability. WP2 main objective is to engage citizens, scientists and policy makers in shaping and conducting research in environmental sustainability, addressing local environmental concerns and global issues.

WP2 Objectives

O2 To engage citizens, scientists and policy makers in shaping and conducting research in environmental sustainability, addressing local environmental concerns and global issues such as biodiversity monitoring by

O2.1 Methodologies and practices. Developing and improving methods for the support of active and collaborative involvement of citizens and scientists, raising public awareness, engaging citizens in debate and action and support citizen initiated and led research related to environmental sustainability;

O2.2 Networking. Establishment and bolstering of networked hubs as permanent science and technology research and exhibition spaces to strengthen, support and make more visible the work done by public engagement organisations, including local/grassroots/ DIY science initiatives related to environmental sustainability by promoting exchange through the organisation of activities and by creating links with experts, policy makers and other stakeholders;

O2.3 Activities. Implementing a programme of activities that covers different actions in relation to citizen participation in environmental sustainability issues, such as discussions, data analysis, and visualisation and mapping; citizen data collecting and volunteer sensing, development of technologies with a DIT and open source approach and discussion on policies, measurement standards, and impacts.

Within DITOs, the title 'environmental sustainability' is used to describe environmental citizen science [2][3]. It attempts to cover the wide range of environmental citizen science that can contribute towards sustainable development [4][5][6]. In order to do that, WP2 will support and promote collaborative practices and public activities covering a wide range of topics including ecological and biological observation, energy production and consumption, food production and consumption, waste management, air and soil quality and urban water cycles.

Thus:

- MP will organise DIY science workshops, seminars and exhibitions.
- ECSA will contribute significantly by mobilising its extensive network for conducting Bioblitz activities and fostering ecological monitoring.
- UCL will carry out hands-on workshops (Explorer of the World), travelling exhibitions (Touch|Play|Learn), discussions and major events (Citizen Science Summit).
- MERITUM will build on previous work and provide training in the area of environmental monitoring (EnvDIYLab).
- RBINS will contribute with exhibition developments and workshops, nature observations in referenced databases on biodiversity and water management, science cafés and Xperilab truck events.
- Other partners will contribute with exhibitions and events as listed in the Appendix of the grant agreement. [1]

The whole list of events can be found in the grant agreement (GA).[1]

4.1 Deliverable goals

The WP2T1 seeks to share methods, approaches and lessons learnt by DITOs partners in their current praxis. This deliverable compiles an **initial set of implementations of citizen science activities** focused on environmental sustainability that either DITOs' partners have carried out or they have planned for the next phase.

Secondly, it aims to **become a working tool for partners to share and exchange their preliminary practices and tips for organising successful public engagement in science events** in relation to environmental sustainability. In order to do this, best practices are identified as the basis for the outreach plan. Moreover, this exchange is facilitated through formative evaluation (section 5.5.4 in D5.1).

Thirdly, it discusses the approach taken to carry out **self-assessment in order to improve the methodologies** used to gather the information and to describe and analyse the activities developed by partners.

4.2 Deliverable structure

The deliverable is organised as follows, it begins with an explanation of the survey methodology used to gather information about the partner's activities.

Then, the activities are analysed and summarised to give an overview of the organisational details and views taken by the partners. The results highlight the key dynamics of the events but also provoke questions that require further investigation.

Next, the deliverable analyses the data based on three aspects: good practice for environmental citizen science events, questions that arose during the analysis of each factor and finally suggestions to improve our way of gathering information. The outcome is a prototype information sheet proposed in deliverable D1.1.

Finally, this methodology is evaluated in relation to the results. The report reflects on the pros and cons of this approach in relation to the work package goals and provides suggestions for improving the methodology.

4.3 Escalator model

The overall objective of WP2 is to engage citizens, scientists and policy makers shaping and conducting research in environmental sustainability. The challenge of public engagement will be addressed by using a virtual *escalator model*. This enables people to decide which level of contribution is suitable for them, while gently exposing them and encouraging them to move to the next level.

They may choose just to install software on their computer or phone and use its sensors with very little intervention (Intensity **Level 1 - Crowdsourcing**) in applications such as monitoring air pollution, where the phone is setup to report measurements. At the next level (**Level 2 - Distributed intelligence**), participants use their cognitive capacity – e.g. engaging in the serious games promoted by UPD in the IGAM4ER competition (http://igam4er.org/) or the crowdcrafting platform developed by Scifabric and used in citizen science activities at Medialab Prado (MP) (http://crowdcrafting.org/). At the next level (**Level 3 - Participatory science**)

participants are engaged in defining the problems that will be explored, work with scientists to collect and analyse the data, and build their capacities in the process. Examples include the ecological observations conducted among the ECSA network in which participants set the area that will be used for exploration and work with scientists in activities such as Bioblitz, where community members concentrate on a small area and record biodiversity in minute details. DIY science operates at **Level 4 – DIY Science**, the level that most empowers participants and increases their capabilities [1].

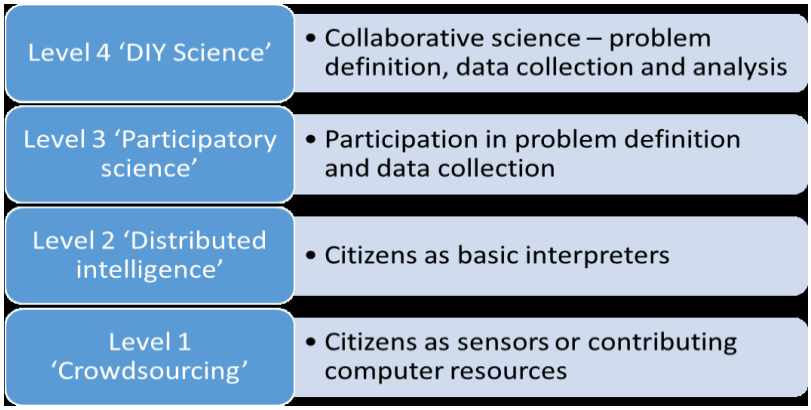

Figure 2: The range of ways citizens participate in science.

We stress the point that we encourage people to become actively involved in scientific practices, there is **no value judgment that Level 4 is necessarily better than Level 1, nor do we believe that all participants should operate at a DIY science level.** Different issues, scientific problems, personal interests, socio-economic conditions, time constraints, and social circumstances all influence the level at which each participant chooses to operate. The aim of facilitators, scientists and policy makers should be to enable people to move smoothly to the level that suits their needs. The **escalator model** is described in the grant agreement. [1]

4.4 Dissemination through events to develop public engagement and capacity building

DITOs' engagement approach emphasises the need for flexibility and adaptation to circumstances. This means ensuring the relevance of the events to the lives of participants by **adapting activities to context and particular situation, co-designing activities, and iterative learning from continuous evaluation.** The consortium draws on local and expert knowledge, and uses a variety of media (online, face-to-face) and methods (publishing information, exhibitions, dialogue and deliberations, hands-on workshops); to build knowledge, skills and confidence as well as mutual trust and respect between participants and institutions.

Public engagement and capacity building are complementary to biodesign and environmental sustainability activities, and are a major mechanism for the 'escalator'. Here the **events** – online activities, travelling exhibitions and labs, science cafés and workshops **are designed to increase capacity, raise interest** and develop better awareness of science and technology issues and practices including citizen science.

5 Plan for public engagement activities

5.1 Methodology followed to determine Plans

The survey methodology used in this deliverable was designed together with the WP1 leader (UPD) and with input from WP5 (eutema and UCL) and in consultation with consortium partners. The questionnaire was jointly developed by the partners and once agreed, filled in by all the partners. By sharing the questionnaire online all that the partners could see the answers and check if the questions were clear enough. When there was any doubt, an interview was set between WP leader and the relevant partner.

This means that D1.1 and D2.1 have a very similar structure and both deliverables have been written between the leaders of the two work packages. This also means that the sections are repeated in both deliverables for the sake of clarity. In effect, the discussions and conclusions differ, since the data and topics are different. However, the same facilitators filled out the same surveys for both biodesign and environmental sustainability activities, which means that their strategies for event planning and delivery remain the same while the topics and some approaches may differ.

The aim of this deliverable is to compile a baseline of current practices employed by partners to design and deliver public engagement activities in the thematic area of environmental sustainability. The baseline provides a foundation that can be used to build upon, share, and compare to as the project progresses. The survey focuses not only on the content and format of each event, but also on organisational details that are usually unarticulated but crucial to the success of such events. The questionnaire can be found in Appendix A.

Every relevant partner in WP2 **selected two or three activities** they considered **representative of their usual practice**. However, not all the questionnaires were fully filled out. Yet we were able to identify some key aspects of the activities that allowed us to extract relevant data to characterize qualitatively the group of the activities they proposed. The data from the questionnaires was used to populate an Excel file that could be analysed. Many of the questions were open-ended so an effort was made to cluster related ideas.

After this analysis the consortium discussed the information sheet proposed in D1.1. This discussion led a second iteration of the information sheet as a double-sided card that sums up each activity in an easy readable and attractive way. This design fulfils two goals. It aims to be informative for the general public, so the front shows practical information about the activity to attract and engage participation. The back shows ‘behind-the-scenes’ information such as advice from experienced organisers.

5.2 Detailed Activity Plan

Seven partners out of eleven have citizen science activities related to environmental sustainability (RBINS, UCL, MP, KI, Meritum, ECSA, UNIGE). Data from those partners have been gathered covering a total of **19 activities**. There was a clear difference between some of them, which allowed us to make a preliminary

classification in 5 different categories: **interactive and travelling exhibitions** (A), **conferences/seminars** (B), **debates at science-cafes and public screenings** (C), **workshops** (D) and **gaming competitions/online engagement** (E). [1]

The comprehensive list is as follows:

RBINS:

- **Small exhibition**. Touring exhibition on urban water management and biodiversity created by scientists, communicators and citizens linked to a referenced database. (A)
- **Poison**. Exhibition for general public with living poisonous animals. (A)
- **Science café.** Mixed workshop with guided tour about the museum treasures. (C)
- **Taxonomy of bioindicators:** workshop/training for visitors of Poison exhibition about taxonomy. An expert will focus on the questions asked by the visitors. (D)

UCL:

- **Touch, play and learn.** Travelling exhibition of DIY tools for environmental monitoring where locals can showcase their prototypes. (A)
- **Citizens without borders.** Meeting with practitioners and makers with guest scientists to discuss topics of environmental sustainability. (C)
- **Public Lab workshops:** Two types of workshops: workshops to learn how to create DIY tools for environmental monitoring and playshops to learn how to focus on the self as a tool for investigation. (D)

MP:

- **CS seminar:** two days of talks with six invited speakers to inspire and present incoming CS workshop. (B)
- **CS prototyping workshop:** after an open call for projects, MP will hold a two week workshop where different prototypes related to ES will be developed. (D)
- **CS prototypes exhibition:** public exhibition where the prototypes developed during the workshop will be showcased. (A)

KI:

- **Env. science cafe:** Cafe where community members and leaders discuss art & science projects related to ES in an informal way with a special emphasis on women in science. (C)
- **Env. friday academy:** workshops for youth (8-16 years) where they explore and experiment with life systems and discuss human-nature relationships. (D)

[1] For the tables, instead of using the complete names of these 5 categories, we have selected a shorter descriptive name for each. Following the same order: exhibitions (A), seminars (B), science-cafés (C), workshops (D) and online-competitions (E).

- **Env. citizen science:** workshop for the general public where they explore and experiment with life systems. (D)

Meritum:

- **Env. science cafe:** regular evening meeting for discussing sustainability with guest speakers. (C)
- **Env. hack the city:** one day workshop as a hackathon to create working applications to share and visualise data in the field of sustainability in urban environments. (D)

ECSA:

- **Bioblitz:** a one-day event in which community members, scientists and students meet in a bounded area to record biodiversity and conduct ecological observations. (D)
- **Teacher training workshop:** workshop to train secondary school teachers in techniques of environmental and biodiversity monitoring. (D)
- **Student competition monitoring:** Interactive online competitions around challenges specifically designed for young people in the area of biodiversity and environmental monitoring. (E)

UNIGE:

- **Map of citizen science participation:** online activity to map citizen science participation across Europe. (E)

The first question that arose is whether these activities could be mapped to the categories of the *escalator model*. The consensus was that this mapping might not work properly because one workshop might be designed for level 2 (distributed intelligence) while another might be targeting level 4 (DIY Science).

The next question was whether the questionnaire tackles this issue. There are two questions (Appendix A) focused on the *escalator model*, yet neither uses the same categories as the escalator. This specific lack must be corrected in future questionnaires to create a better mapping between the DITOs activities and the escalator model. The table shows the number of activities per partner and per category:

Table 1: Number of activities per type and per partner

Institution	*Exhibition (A)*	*Seminar (B)*	*Science Café (C)*	*Workshop (D)*	*Online Competition (E)*	*Activities by partner*
RBINS	2		1	1		**4**
UCL	1		1	1		**3**
MP	1	1		1		**3**
KI			1	2		**3**

Institution	*Exhibition (A)*	*Seminar (B)*	*Science Café (C)*	*Workshop (D)*	*Online Competition (E)*	*Activities by partner*
Meritum			1	1		**2**
ECSA				2	1	**3**
UNIGE					1	**1**
Number of activities by type	***4***	***1***	***4***	***8***	***2***	

The answers to the survey highlight the diversity of activities amongst the partners. This means that seminars from two different partners might be quite different in their content and format.

5.2.1 Thematic topics

We asked the partners to identify the topics they were going to address during their activities. This was an open-ended question so resulted in a large variety of answers that extended beyond environmental sustainability and also addressed notions of citizen science and political topics. We have made an effort to merge and categorise these answers to provide a coherent list of topics:

Multidisciplinary topics:

- Garage science [7]
- Neighbourhood science [8]
- Understanding infrastructures [9]
- Impact and examples of DIY in environmental sustainability
- The importance of building capacity in environmental sustainability and biodiversity monitoring

Specific environmental sustainability topics:

- Urban beekeeping
- The use of poison within medicine and its evolutionary significance
- Endangered species status and preservation
- Taxonomy: methods, techniques, nomenclature
- Evolution
- Bioindicators
- Adaptation
- Survival
- Daily use of mineral resources
- Human body mechanics

- Importance of biodiversity monitoring as well as gaining skills
- Energy production
- Health
- Resource management
- Waste management
- Water management
- Invasive species
- Urban gardening: where science starts to grow?
- AirAid: how to be healthy in unhealthy air?
- Open City budget data: road to open urban environment

Topics about CS itself:

- Participation and engagement:
  - What is needed to engage publics in CS activities?
  - How to increase youth participation and engagement in CS?
  - What citizens can do to get involved in CS?
  - What kind of experiments citizens can run on their own CS experiments?
  - How people can start their own investigations?
  - Impact of exhibition on visitors
  - How to raise interest in scientific topics?
  - How to present science to the general public and schools?
  - Raise awareness on topics related to environmental sustainability and biodiversity monitoring
- Scientific knowledge related topics:
  - Relevance of science to everyday life
  - Limits of scientific knowledge and CS
  - Leveraging citizen data for environmental justice
  - Understanding science by participating in it
- Education**:**
  - Multimedia within a museum and in education
  - Role of CS in education and how to include in school programs
- Links and tensions between industry and public interests

One interesting finding is the large focus on the issues and tensions of citizen science itself. This suggests the need to reflect on methodologies, processes and limits that make citizen science investigations successful in terms of high numbers of participants as well as impacts on the whole of society not just science.

5.2.2 Approaches to Citizen Science for Environmental Sustainability

As stated in the WP2 description, the objective O2.3 calls for a programme of activities that covers different issues in relation to citizen participation in environmental sustainability such as data analysis and visualisation, citizen data volunteer sensing and discussion on policy.

This question was focused on the approaches involved in environmental sustainability and CS the partners were planning in their activities through a multiple-choice options with an open-ended option to allow for unexpected approaches.

Table 2: Approaches to citizen science for environmental sustainability per type of activity

Approaches	*Exhibition (A)*	*Seminar (B)*	*Science Café (C)*	*Workshop (D)*	*Online Competition (E)*	*Activities by partner*
Data analysis /visualisation /mapping	1	1	1	4	n/a	**7**
Citizen data collecting and volunteer sensing	1	1	n/a	3	n/a	**5**
Development of technologies with a DIT and Open Source approach	1	1	0	5	n/a	**7**
Discussion on policies, measurements, standards and impacts	1	1	1	0	n/a	**3**
Other	1	n/a	1	1	n/a	**3**

The results show that the activities were focused on technological actions such as data processing and DIT technologies rather than policy, standards and impact. There were some other options proposed:

- Taking a closer look at the self as data collection instrument
- Inviting interest and promoting engagement
- Public engagement event mainly to raise interest and break down of barriers to engagement

It is important to note that this question was not fully understood for some partners, who did not answer this question. We will rephrase these questions for future questionnaires.

5.2.3 Engagement

i) Level of engagement

The next table focuses on four levels of engagement that partners expected from the public in their activities. These levels refer to the *escalator model* outlined in the Introduction, yet there no exact mapping between the categories since they are different models.

Table 3: Level of engagement per type of activity

Level of engagement	*Exhibition (A)*	*Seminar (B)*	*Science Café (C)*	*Workshop (D)*	*Online Competition (E)*	*Activities by partner*
Attending/ listening	4	1	3	1	0	**9**
Hands-on activities	2	0	1	7	0	**10**
Discussing or contributing to existing projects	2	1	4	3	0	**10**
Proposing and initiating new projects	2	0	1	4	0	**7**

The results demonstrate that all the levels of engagement are being promoted. However, activities where participants propose and initiate their own projects are fewer in number. This level requires more commitment and is therefore expected to be more difficult to achieve. As with WP1, activities tend to focus on the lower levels of engagement. This during phase 2, leaders from WP1 and WP2 together with event facilitators from each partner organisation will work with the WP5 team to use both summative evaluation (section 5.5.3 in D5.1) and formative evaluation (D5.1 section 5.5.4) to share and devise adaptable strategies for different levels of public engagement activities.

ii) Incentives for taking part

This question tries to capture why a person became a participant in the events. This question created as a multiple-choice question in order to relate to existing categories of motivation within the citizen science literature.

Table 4: Incentives per type of activity

Incentives	*Exhibition (A)*	*Seminar (B)*	*Science Café (C)*	*Workshop (D)*	*Online Competition (E)*	*Activities by partner*
Acquiring	3	1	3	7	0	**14**

Incentives	*Exhibition (A)*	*Seminar (B)*	*Science Café (C)*	*Workshop (D)*	*Online Competition (E)*	*Activities by partner*
new skills and knowledge						
Contributing to interesting projects for the common good	1	0	1	7	2	**11**
Being part of a community	1	0	4	5	1	**11**
Solving personal needs	0	0	1	3	0	**4**
Having fun	3	0	1	7	1	**12**
Other	2	0	0	4	1	**7**

‘Acquiring skills and knowledge’ as well as ‘having fun’ were the most frequent incentives, alongside ‘contributing for the common good’ and ‘being part of a community’.

These results raise the question of whether the level of engagement strengthens or weakened these objectives. For example, does an activity where a participant listens to a presentation create more or less knowledge than a hands-on activity? The level of engagement and incentive might be related in such a way that certain incentives or motivations can be strengthened by correctly selecting the level of engagement of a proposed activity. We recommend thinking about this relation when designing new activities to make sure both categories are aligned.

The questionnaire provided a space for the partners to provide additional incentives not covered in the multiple-choice. The results highlighted additional incentives that should be considered for future questionnaires:

Doing things they cannot do in their school / scientific institution / laboratory.

More emphasis on creative process than sticking to institutionalised protocols.

Connecting with nature.

Increasing online CS visibility.

After several discussions with partners we agreed that ‘motivations’ might be a clearer term than ‘incentives’ for this section. This term will be used instead for next questionnaires.

5.2.4 Activity Objectives

This question asked partners about their goals and objectives for each activity. It was an open-ended question; so more than 50 answers were gathered. A summarising effort was done to identify key points and reduce the list into something more manageable, with 12 main objectives. Then we mapped the answers to one of these objectives. This list will become the basis for future questionnaires.

Table 5: List of objectives and their repetition among all the activities

Nº	Objectives	Number of repetitions per activity
1	**Foster connections, establish knowledge networks and create communities.**	4
2	**Be a source of inspiration, ideas and creativity, including artistic expression.**	4
3	**Be a place to arouse curiosity, learn, exchange knowledge and discuss approaches to science and CS.**	10
4	**Gain trust and develop personal abilities and competencies and reduce fear to the unknown, such as real science, scientific explanations and physical phenomena.**	1
5	**Promote Open and Free Source tools and methodologies.**	2
6	**Promote, learn, build and use DIY and DIT tools.**	4
7	**Raise public awareness and become a platform to spread and disseminate citizen science and scientific ideas and methods.**	7
8	**Engage further and/or attract new publics to science and CS.**	8
9	**Collect feedback and good practices to improve CS processes, events and engagement.**	1
10	**Have fun.**	3
11	**Be a place to empower citizens to propose and decide their own interests, activities and projects.**	1
12	**Collect data and/or make a real contribution to science.**	2

The table shows that curiosity, learning exchange knowledge and discuss approaches to science and CS, as well as raising public awareness and attracting new publics where the main objectives (3,7,8). This aligns with the DITOs approach that is based on three pillars: knowledge exchange, public awareness and dissemination of citizen science activities and engagement strengthening.

5.2.5 Activities average duration

This question aimed to identify the average length of engagement a participant might have for the different activities. However, in the case of exhibitions it is also important to ask for the entire period that it would be available to the public. To illustrate the average duration, an interval for each type of activity can be seen in the next table:

Table 6: Average duration per type of activity

Type of activity	*Duration interval*	*Exhibition availability*
Exhibition	30' - 2h30'	Several weeks to nearly a year
Seminar (1 case)	16h	n/a
Science Cafe	1h30' - 2h	n/a
Workshop	2h30' - 15 days	n/a
Online competition	n/a	n/a

It is interesting to point out that visiting an exhibition or enjoying a science cafe is always less than 3 hours. The tables with the complete data per activity can be found in Appendix B.2.

5.2.6 Audiences

i) Numbers of participants for different activity types

There is a high diversity in the number of participants. To give an overview we have created a table that ranks the activities.

Table 7: Intervals with the expected number of participants per type of activity

Type of activity	*Participants interval*
Exhibition	15 – 100,000
Seminar (1 case)	100 - 150
Science Cafe	6 - 20
Workshop	6 - hundreds
Online competition	Thousands

As expected, exhibitions and online competitions can accommodate more people. Workshops are more variable, since they depend on many factors such as materials, weather and space availability. Partner insights suggest that cafes with an attendance of 20 people or less allow for meaningful interactions. These initial insights will be complemented by results from the satisfaction questionnaire (Section 5.2 in D5.1) as they will help determine the impact of numbers and other conditions on attendees' experiences. The complete results for this survey question can be found in Appendix B.1.

ii) Target audiences

To have a rough idea about the audiences that may attend each event, we asked the organisers to identify audience types from these categories: general public, doers/amateurs/makers, activists/hackers/communities of concern, policy makers/decision makers, students/youngsters, educators, academics and others.

Classification of audiences has been organised in the next table:

Table 8: Expected audience categories per type of activity

Audience	*Exhibition (A)*	*Seminar (B)*	*Science Café (C)*	*Workshop (D)*	*Online Competition (E)*	*Activities by partner*
General Public	4	0	4	4	1	**13**
Doers/amateurs/makers	3	1	3	6	0	**13**
Activists/hackers/communities of concern	2	1	2	5	0	**10**
Policy makers/decision makers	0	0	2	1	1	**4**
Students/youngsters	1	0	2	4	1	**8**
Educators	3	0	2	3	0	**8**
Academia	1	1	1	2	0	**5**
Other	1	0	1	0	0	**2**

According to the results, most of the partners are targeting the general public and amateurs (doers, makers...). The second most targeted groups are students/youngers and educators. This is aligned with O2.1 WP2 objectives: to raise awareness and engage citizens in debate and action.

The audience least catered for are policy and decision makers as well as academia. Since the aim is to engage policymakers, this raises the need to think how these numbers will be balanced across the activities implemented by all partners in the work package. Although we reach high rates of audience, if the project does not involve policymakers in the activities the impact of the project could be limited.

The conclusion is that this work package will have to collaborate closely with WP4 to provide input into their policy engagement activities and explore tailored policy strategies for WP2. This integration of activities across work packages is central part

of DITOs. The WP2 outreach plan aims to engage citizens as well as policy/decision-makers in activities related to environmental sustainability and provide opportunities for discussion on environmental policies with policy makers on topics such as urban green spaces. WP4 aims to create further opportunities of capacity building for policy makers and CS practitioners to work together. This will be facilitated through stakeholder round tables, discovery trips and a pan-European policy forum. Furthermore, discussions on policy-relevant topics arising from WP2 (and WP1) will feed into the formulation of 4-page policy briefs covering 6 different thematic areas. These include environmental sustainability, biodesign, open science, inclusion and gender, ethics and quality evaluation, link to business and SMEs.

It is important to note that from the point of view of citizen science, the decision making process should be more inclusive and distributed, a real DIT process. Due to this issue, terms such as ‘policy and decision makers’ will need further discussion.

As stated at the beginning of this section, audience categorisation is intended to help organisers to align goals, activities, materials and language to reach the intended publics. Yet the question of how to evaluate the type of audience that participate in a specific event remains unclear. Giving surveys to participants and asking them identify to their audience category might be problematic. How can the project deal with people that fall into multiple categories, such as being a young person as well as general public? The consensus within the consortium was that participants should be telling their own stories instead of filling in survey forms. This would allow rich qualitative descriptions that would become a good source for audio-visual documentation and ethnographic research. The focus will then shift towards qualitative interpretation of the personal contributions rather than in quantitative data. This method might better capture the broad diversity of participants in citizen science.

iii) Strategies to support a diversity of perspectives

One of the DITOs objectives is to provide many points of access for a wide variety of citizens including women, children and disadvantaged groups. Thus we asked the partners which strategies they were planning regarding at this respect.

Only 10 out of 19 activities answered this question. This was an open question with variety of answers. Many of them referred to ‘keeping things open’ and to making an explicit communication effort to engage different publics. Other suggested strategies were organising open calls for projects to make sure different voices and interests are taken into account. However, due to the low number of answers, we must reflect upon this point with the rest of the consortium to make sure that best strategies are adopted.

iv) How to support the creation of links

Favouring links means promoting both professional and personal relationships among participants beyond the event itself. Providing appropriate conditions to let these relationships flourish could have a very positive impact not only in the individual engagement of the participants but also in the creation of communities of interest related to citizen science.

In the questionnaires the strategies that partners use to favour links are very diverse. Common approaches are the use of social media to ease the communication and keep in contact, the creation of work groups so that participants can work towards a

common goal or scheduling refreshment breaks to increase social encounters. Some of the partners rely on the facilitators' and mediators' labour, so links between participants are encouraged through role-playing. These connections might have an impact on CS engagement, since getting in contact with people with similar interests may encourage participants to move to the next level on the *escalator model*.

From our experience in MP, there are combinations of actions that make it easier to fulfil this objective. Two-week workshops allow participants to have time to talk and know each other. Secondly, organising collaborators and project originators around specific projects encourages debate and reflection within and among group. Third, having a professional team of experienced facilitators can help in suggesting useful links with local entities such as non-governmental and civil society organisations, research centres and councils. Finally, we encourage social encounters outside of the workshops by providing a common place to stay during the workshop such as shared apartment or hostel. This means the participants can live together and share experiences and thoughts over a period of days.

5.2.7 Resources for hosting Environmental Sustainability activities

The resources section refers to the personnel and the material requirements that are needed to organise each type of event. This is part of the 'behind the scenes' information, which includes both the resources and the tricks that the partners use to organise each event. If these are well documented and widely shared, the partners will be able to learn from other's experiences. This is why we also included several questions around it in the questionnaire. This section is divided in: *Space, time and materials, and Personnel*.

At this stage, we did not have enough data to evaluate the suitability of these approaches and decided that in a future phase the consortium will carry out deeper analysis.

- i) Space, time and materials:

There was a diversity of answers to this question and the list present an overview of elements to be taken into account:

- Indoor spaces:
    - Warm, comfortable, big, open space for collaboration
    - Small, quiet spaces for mini-workshops
    - Comfortable cafes with low noise levels and wheelchair access
    - Nearness to transport links
    - Prepared gallery for certain exhibitions
- Outdoor spaces:
    - Spaces that invite the creation of safe spaces (e.g. not too exposed)
    - Spaces away from potential hazards (e.g. risk assessment to determine sources of danger such as power lines)
    - Basecamp set in a big open space
    - Locate each activity in a different corner with a desk and equipment.
- Furniture:
    - Big tables

    - Chairs
    - Panels and blackboards for posters, diagrams, sketches
- Electricity, internet and stationery:
    - Wi-Fi access is important
    - Enough electricity sockets for the participants
    - Large sheets of paper
- Food and beverage:
    - Refreshments
    - Breakfast
    - Lunch
    - Dinner
    - Cafe
    - Vegan/gluten free food
    - People can bring their own lunch
- Timings:
    - Relaxed schedules to enjoy and make connections
    - Breaks with refreshments

ii) **Personnel requirements**

During the analysis we realised that most of the partners were not considering all the roles that are involved in the events. The main reason is that we tend to forget the personnel that work in the places where the activities take place, but who are not specifically involved in these activities. These personnel are critical, so we decided to create a comprehensive list of all the people and roles that partners mentioned in the questionnaires:

Direct Roles:

- Coordinator / Organiser / Curator
- Producer
- Technical assistants
- Facilitators / Cultural mediators
- Hosts/moderators
- Communicators
- Maintenance personnel
- Cleaners
- Person responsible for documentation
- Scientists

External:

- External advisors
- Scientists
- Mentors
- Guests

It is essential to distinguish between the requirements that arise when organising the event and those that emerge while running it. Curators are essential at an organisational stage, but their presence is less important once the exhibition is open to the public. This differentiation can help to reduce unnecessary costs so future questionnaires will explore this difference.

The MP team want to highlight the importance of cultural mediators: they are specialized workers that not only welcome and assist visitors and participants, but also they listen to audience's interests and try to link them with the activities of the centre where activity is being carried out. Both of these elements are important for expanding links inside and outside MP. This is important for DITOs since cultural mediators can make links between different initiatives and guide participants to identify the best level of engagement for them within the 'escalator' model.

5.2.8 Communication and dissemination

In order to communicate and disseminate the activities the DITOs partners used many different methods. The next table ranks the methods used by the partners.

Communication and Dissemination Channel	Number of activities that use a specific channel
Website	9
Facebook	9
Twitter	9
General newsletter	7
Specific mailing lists	7
Social media (unspecific)	2
Meetup, Eventbrite, etc	1
Radio	1
TV	1
General press	1
Flyers	1
Posters	1
Explainers from a specific centre	1
Personal meetings	1

The results show that that the preferred communication methods are websites, mailing lists as well as social media such as Facebook or Twitter. Typically the same event is communicated using multiple communication methods. Since building offline communication/dissemination was not a salient approach, partners will work on strategies to collectively create methods that each group can adapt.

5.2.9 Activity outputs

The survey tries to capture the variety of outputs from the partner activities. The results from this question are categorised into material and immaterial outputs. Overall the most frequently mentioned outputs were documentation and prototypes.

- ***Material:***
    - Prototypes:
        - E.g.: Applications
    - Exhibition
    - Documentation:
        - Drawing sketches and diagrams
        - Code
    - Data:
        - E.g.: Biodiversity data
    - Sheet of participants:
        - Sign-up sheets with mails to follow up
    - Urban landscape modification
        - E.g.: Revegetation of pond banks

- ***Immaterial:***
    - Collaborations
    - Extended network
    - Follow up on participants' suggestions

5.2.10 Documenting activities

This section explores the documentation of activities in more detail. The survey question asked about the type of documentation each partner was gathering. The consortium results show a clear concern about gathering good documentation of each activity. The results show a diverse range of ways of documenting CS:

- Collaborative online platforms:
    - Shared online documents
    - Code and blueprint repositories
- Multimedia documentation:
    - Installation instructions
    - Photographs
    - Audio
    - Video
    - Posters
    - Live streaming
- Memory booklet
- Web page
- Blog posts
- Scientific and technical data and information:
    - Notes

    - Maps
    - Spectral data
    - How-to manuals
    - Questions of interest
    - Prototypes/items instructions and manuals
- Pedagogical material:
    - Training curriculum
    - Methodology and production
    - The exhibition itself
- Social networks and tools:
    - Meetuplike platforms
    - Facebook
    - Twitter
    - Instagram/Flickr
    - Video channels

The partners created a distinction between documenting scientific processes via data and documenting the activity itself as photos and videos of participants. Yet sometimes the same tools and formats were used for both purposes. Often these categories overlapped so that a document could belong to more than one category:

- Documentation of the preparation/organisation
- Documentation of the scientific process, results and conclusions
- Documentation of the public activity (for communication and dissemination purposes)

When documenting the activity it might be useful to separate the documentation generated via the organisation process of the event such as shared online documents, budgets and the one about the event itself such as photos, videos and interviews. Our objective in the next phase is to link the type of documentation to its goal and use.

Some questions arose from these results: How are the participants going to be acknowledged? How can documentation take into account every participant? How important is a crowdsourced participant contribution compared to the scientist that initiated the research project? How can documentation show that the participant's effort was worthwhile? The MP team propose that Wikipedia might be useful inspiration for DITOs in the way that every participant contribution is logged and authorship is acknowledged.

5.2.11 Participant feedback

As stated in D5.1, gathering feedback is essential since it will enable an understanding of participant experience and provide a way to improve event design and delivery practices and methodologies.

Partners described two main approaches that they currently use to gather participant feedback: personal communication and evaluation forms. The latter forms the baseline for the development of the participant satisfaction questionnaire (section

5.5.4 D5.1). Partners also propose additional ideas. Here is a comprehensive list of the methods that are implemented by the partners to gather opinions and suggestions from participants:

- Personal communications with participants:
    - Direct conversation and comment gathering during and after the event
    - Comparison of their expectations before and after the event
- Evaluation forms:
    - Surveys of visitors
    - Personalised evaluation forms
    - WP5 standard evaluation forms
    - Meetup rating system
    - Comments collected from event website
- New ideas:
    - Moneybox proposal: 'How much would you pay for an event like this?'

5.2.12 Good practice challenges

The last phase of the DITOs project involves the making of a good practice report for participatory environmental citizen science. To prepare for this, we asked each partner to identify the main challenges when designing or organising activities. The result for this question is a list that will be developed into a guide for dealing with these challenges. As mentioned in D1.1, the answers to these surveys will be used to develop a facilitator's guide to address the challenges facilitators commonly face. This will begin in phase 2 in collaboration with the WP5 team using Action Research through one-to-one and group discussions (section 5.5.4 in D5.1).

- Audience challenges:
    - Dealing with a wide diversity of participants such as marginalised groups.
    - How to reach and listen to participant interests.
    - How to address participant expectations.
    - How to manage the discovery process when exposing participants to something new.
    - How to encourage the evolution of engagement through the steps of the *escalator model*.
    - How to create stronger connections between participants.
    - How to encourage more active public participation in passive events such as a conference.
    - How to equip participants with skills to pass on knowledge to other participants.
- Developing strategies:
    - To communicate better the concept of each event such as playshops.
    - To improve the collaborative work within the groups.
    - To better manage conflicts.

    - To document, present and promote prototypes including maintenance and automation when necessary.
    - To document and show the process of activities.
    - To find or prepare guests and speakers to engage more with the public.
    - To approach research institutions to openly discuss collaborative projects with artists.
- Developing appropriate evaluation indicators:
    - The impact and scope of the event
    - The further development of prototypes
    - Personal links produced during the event
    - The evolution of participant engagement
- The best way facilitate 'living exhibitions' that change over time, while hosting small activities such as workshops, demos and discussions around the prototypes.
- The best way to predict the resources that large scale activities might require in terms of budget, personnel and materials.
- The best way to manage the accessibility and availability of the data generated during activities.

6 Summary and discussion

This section summarises and discusses the common answers amongst partners that might be considered examples of good practice for organising and running citizen science events.

6.1 Good practice summary

Analysing the survey data has led us to identify a series of popular approaches and good practice patterns:

- Data gathering, visualisation and development of DIT tools are popular trends among DITOs partners as approaches to environmental sustainability in citizen science.
- Providing opportunities for having fun and exchanging knowledge are two popular incentives for people to participate in CS and the organisers should encourage them.
- Making sure that science cafes have fewer than twenty participants.
- Personal interviews with participants and contextualised feedback may be better than survey forms identifying target audiences. The methodology chosen needs to be appropriate to the situation and context.
- The survey suggests that in order to maintain diversity of perspectives requires the implementation of structurally open and public processes such as open calls for proposals. These structures will help with listening to participant comments and opinions.

- Open strategies as described above may strengthen the feeling of being part of a community, which may in turn, facilitate the upward movement along the *escalator model*.
- The best strategies for encouraging links between participants are to create projects and activities where participants actively work and create together. Social encounters outside of the activities also play an important role.
- It is advisable to use professional facilitators and cultural mediators that welcome participants, listen to their interests and encourage them try activities according to their level of engagement.
- Web pages and social networks are the most popular channels for spreading information about activities. Yet is also common to use more than one communication channel. These channels will depend on the target audience one expects to reach.

This is very valuable (self) knowledge for facilitators to work hand in hand with WP5 through both summative and formative evaluation. In the Action Research part of the evaluation it will enable focus areas to be targeted and in the formative area, to design/review of future evaluation templates that gather meaningful and truly useful data.

6.2 Questions from the analysis

Interesting questions have arisen during this process that require further reflection and debates between partners:

- From the level of engagement analysis we found that initiating new projects is less supported. This is reasonable since this report covers the first phase of DITOs and these projects will requires higher levels of commitment and preparation. The question arises is whether it is advisable to rebalance the different levels of engagement during the next phase of DITOs.
- In order to popularise participatory research approaches for environmental sustainability will require links with citizen science communities and decision makers at city, national and European levels. One way to facilitate such links is to organise public citizen science events that can attract policy makers because they meet their own interests and concerns. We will share good practices in this regard with WP1 and work closely with WP4 providing input into DITOs policy engagement activities and exploring options for WP2.
- The decision-making process needs to be more inclusive and distributed and terms such as ‘policy and decision makers’ need to be further discussed amongst the partners.
- There needs to be reflection about how to properly acknowledge the contribution of participants. This did not emerge from the questionnaires but was a key issue during conversations amongst the partners. This is essential for engaging with the public, so it must be carefully debated.

- ‘Feedback’ is a powerful tool but there are many ways to gather it. For example UCL inspired us with their ‘Moneybox’ concept (“How much would you pay for an event like this?”). Therefore, we suggest the need for consortium discussions in collaboration with WP5 on other ways of getting feedback on activities.

To improve our own methodology for gathering event information, the WP1 leaders proposed a very interesting information sheet that structures all the survey information in an easy readable way. The template for this can be found in Appendix C. WP1 have been using it for D1.1, where it is given the team the opportunity to evaluate the information sheet and some improvements.

Since our joint goal is to design tools that capture good practices when organising citizen science events, we propose testing an iteration of this design in the next phase. This information sheet is designed as a double sided, folded sheet where the front includes information about the activity that is useful for both participants and organisers. This mean the sheet can be used as a flyer to promote an event. On the back the sheet includes information that is relevant for organisers such as information about activity objectives, expected audience and resources that are needed. In this way the information provides good practices information for organisers. This design is tentative and will be reviewed with the WP5 team throughout phase 2.

Information sheet contents:

Front

1. Institution
2. Activity title
3. Appealing self-descriptive photo of the event
4. Where, when and how long?
5. Activity description:
    a. What?
    b. How?
    c. For whom?
6. More info at: web, etc.

Back

1. Activity objectives
2. Audience & engagement
3. Partners
4. Agenda set-up
5. Communication channels
6. Documentation
7. How to acknowledge participants
8. Resources needed: people, time, budget, space
9. Evaluation
10. Improving tips and advices from experience

6.3 Reflection on methodologies for data collection

By carrying out this survey process we realised that the questionnaire managed to capture suitable information, but some questions were not answered because they were not clear. This will means that the survey questionnaire will have to be revised and improved for future evaluation.

We realised that it is necessary to collaborate very closely with the leaders of the various work packages, WP1 (UPD), WP4 (ECSA) and WP5 (eutema). The key aspect involves synchronising methodologies to implementing a common framework to gather the relevant information while avoiding repetition when interviewing participants and partners.

- The next iteration of the survey should map each activity against the *escalator model.*
- After some internal discussion, we think that the questions related to environmental sustainability could be augmented and improved. Our suggestion is to create a specific section for environmental citizen science, and be more clear and specific in the questions.
- The open-ended question about activity goals is important to understand the organisers' intentions and should be kept in future questionnaires,
- We suggest adding a multiple-choice question with objectives we identified in this phase. This can help avoid repetitions and identify common goals between organisations and facilitate the sharing of good practices.
- The 'average duration' question might lead to confusion. It might refer to the duration of a certain activity for a participant, how long an exhibition is publicly available, or even the required time to organise an event. We suggest separating these three elements for clarity.
- The 'personnel' question might be too broad. We suggest being more specific by using a predefined set of roles in combination with the times required. This can be divided in three stages, before the event, while this is running, and once it is finished, gathering documentation and dissemination of results.
- In terms of documentation, we suggest distinguishing between the means, the tool or the format and the information being documented. Thus it may be related to the organisation of the event such as personnel needs, to the event itself such as photographs of the event or to the results of the event such as the source code.
- It would be advisable to include a question about how participants are being acknowledged in the activity.
- We missed more personal reflections and tips from previous experiences from partners. Thus, we suggest questions to gather qualitative information such as, which problems have you encounter when running these activities? How would you prevent them? What tips would you give to somebody to organise an event like this?

7 Conclusion

In this deliverable we have shown first a description of the initial implementations of environmental sustainability activities that the partners have selected as representative of their usual practices. The information for these activities was gathered via a survey questionnaire filled in by the DITOs partner organisations. Then an analysis of the data was performed by identifying key elements to develop an outreach plan.

The activities we have analysed have been already developed or they are already planned for next phases. In order to optimise the outreach of environmental sustainability through citizen science the good practices that have been identified will be reinforced in future activities. That is:

- To perform interviews and use ethnographic approaches during events to understand participants' interests, listen to preferred topics and gather feedback. Utilising professional facilitators such as cultural mediators is recommended for this purpose.
- To promote open public processes so citizens can participate in different stages of the organisation of an event from topic forming, creating experiments and dissemination of results.
- To promote the use of open and free licenses for outputs such as prototypes to encourage open knowledge and strengthen citizen science dissemination.
- To promote the creation and maintenance of active communities so engagement will be strengthened.
- To design activities where participants can carry out different projects together and facilitate additional social spaces and relaxed schedules to let relationships flourish.

The analysis also revealed a set of questions about unresolved issues such as:

- Proper acknowledgement of the contribution of participants in citizen science processes
- Promotion of inclusive collaborations where citizens, communities of concern and policy makers work together in citizen science activities.

Such questions will be discussed and reviewed periodically to encourage the proposal of original and effective solutions to be monitored during the project.

Moreover, to better present citizen science activities and be able to improve the process of gathering good practices and experiences from citizen science organizers, an information sheet scheme was proposed. This scheme will be tested as a key part of the outreach plan to assess if its design to optimise ease of use for both participants and organisers might encourage other stakeholders to organise more citizen science activities and to increase engagement of the public.

Finally, the results from the survey have also identified some weaknesses in the questionnaire methodology in fully capturing all aspects of the activities. This has led to the proposal of a set of improvements for the next phase of DITOs. Among them, including questions to gather ideas, suggestions or tips from personal experiences for other organizers seems to be essential.

8 Bibliography / References

[1] Doing It Together science (DITOs), grant agreement 709443.

[2] In-Depth Report: Environmental Citizen Science: http://ec.europa.eu/environment/integration/research/newsalert/pdf/IR9_en.pdf

[3] http://researchbriefings.parliament.uk/ResearchBriefing/Summary/POST-PN-476#fullreport

[4] Liu, H., Kobermus, M. (2016). Citizen Science and Its Role in Sustainable Development: Status, Trends, Issues, and Opportunities. *Analyzing the Role of Citizen Science in Modern Research.* http://www.igi-global.com/chapter/citizen-science-and-its-role-in-sustainable-development/170188

[5] Dunkley, R.A. (2016). The Role of Citizen Science in Environmental Education: A Critical Exploration of the Environmental Citizen Science Experience. *Analyzing the Role of Citizen Science in Modern Research.* http://www.igi-global.com/chapter/the-role-of-citizen-science-in-environmental-education/170191

[6] http://www.ecsite.eu/activities-and-services/news-and-publications/digital-spokes/issue-11#section=section-indepth&href=/feature/depth/are-you-ready-citizen-science

[7] http://medialab-prado.es/article/taller-seminario_interactivos09_ciencia_de_garaje

[8] http://medialab-prado.es/article/interactivos_ciencia_de_barrio

[9] http://medialab-prado.es/article/visualizar11_taller_seminario

Appendix A. Questionnaire

This is the questionnaire that was jointly developed by the consortium partners.

CASE n°	*Name of the type of event*
Partner name	
Activity type	□ Exhibition □ Conference/Seminar □ Discussion/café/screening □ Workshop □ Policy event □ Other
Short description of the format and methodology *(max. 50 words)*	
Picture(s) that reflects the methodology *(please paste)*	
Objectives	
Average duration	
This type of activity is usually planned :	□ during the week □ on weekends □ during the day □ on evenings
Approximate number of participants	
Target audience	□ general public □ doers/amateurs/makers □ activists/hackers/communities of concern □ policy makers/decision makers □ students/youngsters □ educators

	□ academia □ other *(please specify)*:
Audience level of engagement	□ attending/listening □ hands-on activities □ discussing or contributing to existing projects □ proposing and initiating new projects
What is (are) the approach(es) to citizen science for Environmental Sustainability?	□ data analysis, visualisation and mapping □ citizen data collecting and volunteer sensing □ development of technologies with a DIT and open source approach □ discussion on policies, measurement standards, and impacts □ other *(please specify)*:
Examples of topics that could be discussed during this type of event	
How are the contents/program/agenda configured? Are they decided only by the organiser, or is there any type of open call?	
What communication channels and tools do you use for this type of event?	
What are, in your opinion, the incentives that motivate participation in this type of event?	□ acquiring new skills and knowledge □ contributing to interesting projects for the common good □ being part of a community □ solving personal needs □ having fun □ other *(please specify)*:
Is there any person to present, explain, talk about the contents, facilitate? Please explain his/her role	

Do you have specific strategies to include participants with a diversity of perspectives? If yes, which are those?	
Estimation of the time and personnel necessary to plan and carry out the event	
How do you plan your events in terms of the arrangement of the space, provision of tools and equipment, refreshments, etc? How do you think these decisions affect how your event unfolds?	
How is the budget spent? (give an approximate % per)	● Travel/accommodation: … % ● Communication/dissemination: ... % ● Materials and equipment: … % ● Fees/Personnel: ... % ● Other
Does this type of event favour links between participants beyond the event itself? If yes, how do you think this is achieved?	
What kind of documentation results from this type of event? Who does it? Is it publicly accessible? What license is used?	
Outcomes: are there tangible	

outcomes / prototypes / results? In what way are these used? Do you follow up on these?	
Feedback: how do you acquire feedback? In what way has it reshaped the event?	
What is in your opinion the greatest challenge or improvement for this type of event?	

Appendix B. Summary tables

Here there are some of the tables that were used to perform the analysis.

B.1 Number of participants

The table shows the expected number of participants per activity.

Table 9: Number of expected participants per activity

Institution	*Number of participants*
RBINS - Small Exhibition	5-10
RBINS - Poison	100,000
UCL - Touch, Play, Learn	150
MP - Science prototypes	6000
MP - Seminar	100-150
UCL - Citi. With. Borders SC	6-8
RBINS - SC	-
KI Env. SC	15-20

Meritum- Env. SC	15-20
KI - Env. Friday Aca	8-10
KI - Env CS	6-10
MP - CS prototype WS	60-70
ECSA - Bioblitz	12- hundreds
ECSA - Teacher train. WS	-
RBINS - Taxo. Bioindicators	10
Meritum - Env. hack the City	10-15
UCL - Public Lab Workshops	6-20
ECSA - Student Comp. Monitoring	-
UNIGE - Map of CS participation	Thousands

B.2 Average duration per activity table

This table shows that 9 out of 19 activities last less than half a da. 2 activities require almost a day and another 2 require more than one day. There is no data for 6 of those activities.

Table 10: Average duration per activity

Institution	***Exhibition availability/Num Sessions***	***Activity duration***
RBINS - Small Exhibition	Several weeks	-
RBINS - Poison	10 months	1h30’
UCL - Touch, Play, Learn	-	2h30’

MP - Science prototypes	2 months	30’
MP - Seminar		16h
UCL - Citi. With. Borders SC		1h30’
RBINS - SC	6/8 per year	2h
KI Env. SC		2h
Meritum - Env. SC		2h
KI - Env. Friday Aca		4h
KI - Env CS		6h
MP - CS prototype WS		120h (15d, 8h/d)
ECSA - Bioblitz		3-24h
ECSA - Teacher train. WS		-
RBINS - Taxo. Bioindicators		4h - several days
Meritum - Env. hack the City		8h
UCL - Public Lab Workshops	4 WS x 1-2 days; 5 WS	2h30’
ECSA - Student Comp. Monitoring	-	-
UNIGE - Map of CS participation	3 years	-

B.3 Objectives

This table show the objectives that are most frequently addressed by each activity.

Table 11: Objectives per activity

Institution	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***	***12***

Institution	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*
RBINS - Small Exhibition	x		x					x		x		
RBINS - Poison							x	x				
UCL - Touch, Play, Learn			x			x						
MP - Science prototypes		x			x	x	x					
MP - Seminar		x	x				x					
UCL - Citi. With. Borders SC			x									
RBINS - SC			x							x		
KI Env. SC												
Meritum - Env. SC	x											
KI - Env. Friday Aca		x	x					x				
KI - Env CS			x				x				x	
MP - CS prototype WS	x		x		x	x			x			
ECSA - Bioblitz												
ECSA - Teacher train. WS								x				x
RBINS - Taxo. Bioindicators			x				x	x				
Meritum - Env. hack the City												
UCL - Public Lab Workshops		x	x	x		x		x		x		x
ECSA - Student Comp. Monitoring	x						x	x				
UNIGE - Map of CS participation							x	x				
Totals	**4**	**4**	**10**	**1**	**2**	**4**	**7**	**8**	**1**	**3**	**1**	**2**

This table shows the most frequent objectives per activity category:

Table 12: Most popular objectives per type of activity

Institution	*1st Repeated*	*Test*
Exhibition	3,6,7,8	2 - Be a source of inspiration, ideas and creativity, including artistic expression 3 - Be a place to arouse curiosity, learn, exchange knowledge and discuss approaches to science and CS 6 - Promote, learn, build and use DIY and DIT tools 7 - Raise public awareness and become a platform to spread and disseminate citizen science and scientific ideas and methods 8 - Engage further and/or attract new publics to science and CS
Seminar	2,3,8	
Science Cafe	3	
Workshop	3	
Online application	7,8	

Appendix C. Proposed structure for information sheet

This is the design of information sheet proposed in D1.1, which has evolved towards the two-sided sheet proposal in section 6.2.

WHAT	**Event name**
	Type of activity ☐ Interactive & travelling exhibitions ☐ Conferences / Seminars ☐ Gaming competitions / Online engagement ☐ Discussions / debates at Science cafés & Public screenings ☐ DIY & DIT Workshops
	Description (format & methodology) **Examples of topics that could be discussed during the event** **Pictures**
WHY	**Objectives** **Audience level of engagement:** ☐ attending/listening ☐ hands-on activities ☐ discussing or contributing to existing projects ☐ proposing and initiating new projects
WHEN	**Average duration:** ☐ < 1 hour ☐ 1-2 hours ☐ 3-4 hours ☐ 4-6 hours ☐ 1 day ☐ 2 days ☐ 3 days ☐ 4-6 days ☐ > 1 week (specify): **This type of activity is usually planned:** ☐ during the day ☐ on evenings ☐ during the week ☐ on weekends
WHERE	**Location:** ☐ museum/art gallery ☐ primary/secondary/high school ☐ university ☐ hackerspace / fablab ☐ other (specify):
WHO (TARGET)	**Approximate number of participants:** ☐ < 15 ☐ 15-40 ☐ 40-100 ☐ 100-200 ☐ 200-500 ☐ 500-1000 ☐ > 1000 **Target audience:** ☐ general public ☐ doers / amateurs / makers ☐ activists / hackers / communities of concern ☐ policy/decision makers ☐ students / youngsters ☐ educators ☐ academia ☐ other (specify):
HOW	**How are the contents/program/agenda configured?** ☐ decided by the organiser (specify): ☐ open call (specify): **Communication channels and tools:** ☐ social media (Facebook/Twitter/…) ☐ Eventbrite/Meetup ☐ website ☐ mailing list ☐ posters/flyers ☐ other (specify): **Incentives that motivate participation in this type of event:** ☐ acquiring new skills and knowledge ☐ contributing to interesting projects for the common good ☐ being part of a community ☐ solving personal needs ☐ having fun ☐ other (specify): **Strategies to include participants with a diversity of perspectives** **How do you plan your events in terms of the arrangement of the space, provision of tools and equipment, refreshments, etc?** **Is there any person to present, explain, talk about the contents, facilitate?** **Estimation of the time and personnel necessary to plan and carry out the event**
OUTCOMES & EVALUATION	**Does this type of event favour links between participants beyond the event itself?** **What kind of documentation results from this type of event?** ☐ photos ☐ videos ☐ articles ☐ posts on social media (Twitter/Facebook/…) ☐ booklet ☐ other (specify): **Are there tangible outcomes / prototypes / results?** **How do you acquire feedback?** ☐ questionnaire ☐ interview ☐ other (specify): **Greatest challenge or improvement for this type of event**