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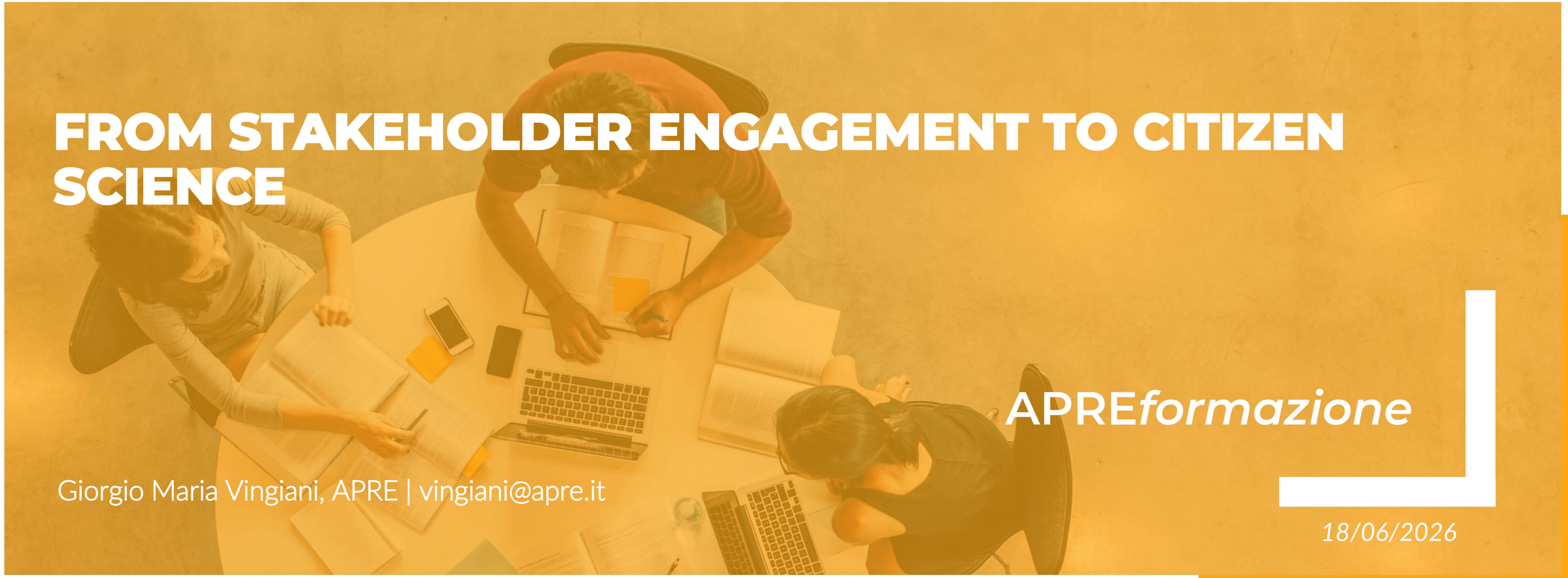

FROM STAKEHOLDER ENGAGEMENT TO CITIZEN SCIENCE

APRE*formazione*

Giorgio Maria Vingiani, APRE | vingiani@apre.it

18/06/2026

Agenda

10.00	**OPENING**
	▪ Course introduction and learning objectives ▪ Alignment on key concepts: Stakeholder engagement, Co-creation, Citizen Science ▪ Science–society dialogue as an integral part of research design
10.20	**Engagement Methods and Tools** ▪ Stakeholder identification and analysis ▪ Stakeholder mapping techniques ▪ Assessing interests, needs, and levels of engagement ▪ Designing targeted engagement strategies
11.10	**Participatory Approaches** ▪ Integrating participatory methods across research phases ▪ Co-creation methodologies ▪ Innovative formats and gamification for engagement ▪ Practical examples and reflective discussion
11.30	**Citizen Science** ▪ Citizen Science as a participatory approach ▪ Roles of citizens: from data collection to co-analysis ▪ Case examples and impact
12.00	**Conclusion**

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Key Elements of the Lesson

- Understand the broader purpose of **science-society dialogue**
- Creation of a **shared vocabulary** for key concepts such as stakeholder engagement, co-creation, and Citizen Science
- Development of practical techniques for **identifying and analyzing stakeholders**
- **Participatory methods** and their integration in research and project activities
- Introduction to **Citizen Science** is addressed as a specific participatory approach.
- Exercise to consolidate the acquired knowledge

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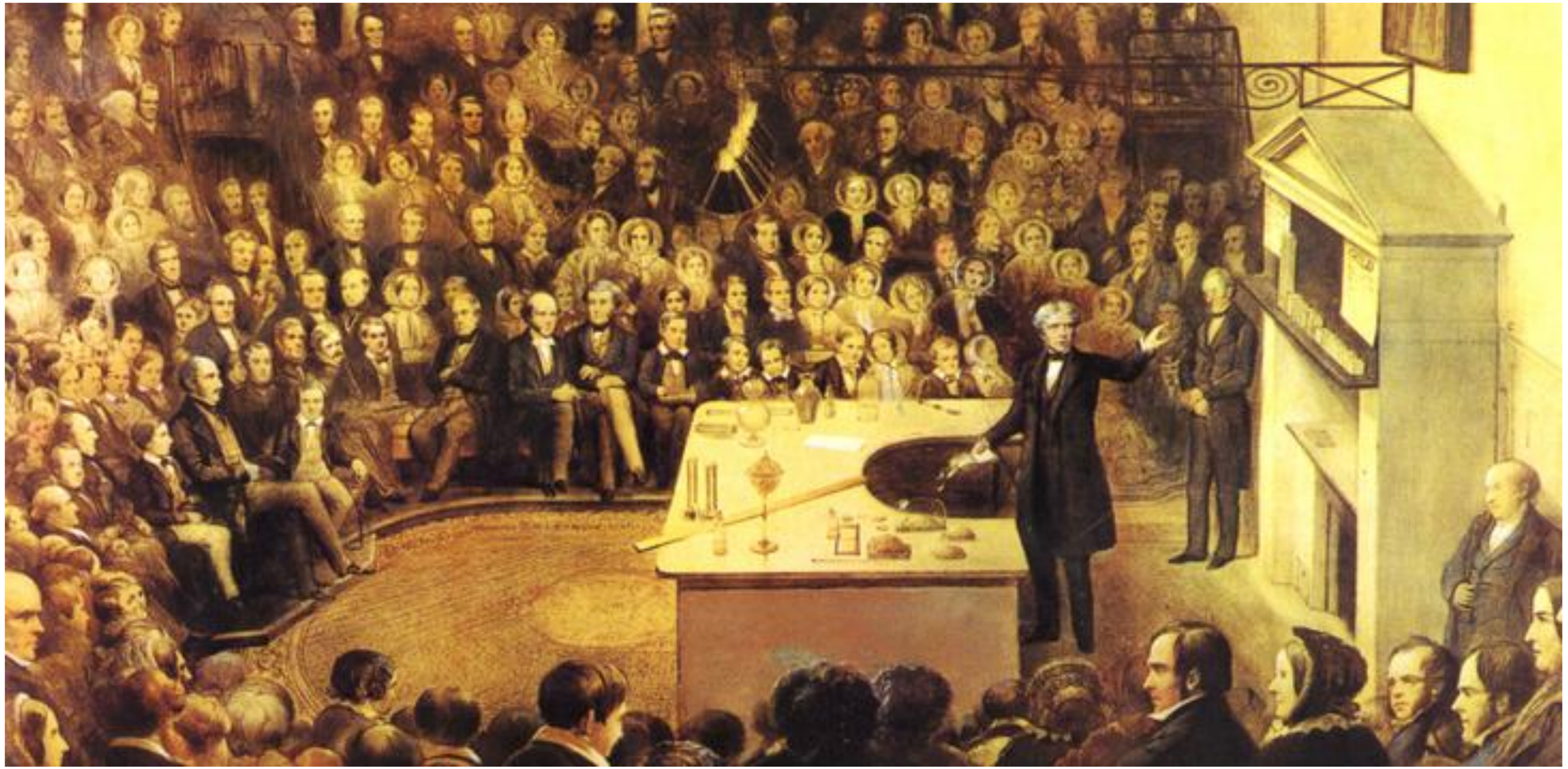

- Michael Faraday presented his first Christmas lecture in 1827, on the topic of Chemistry

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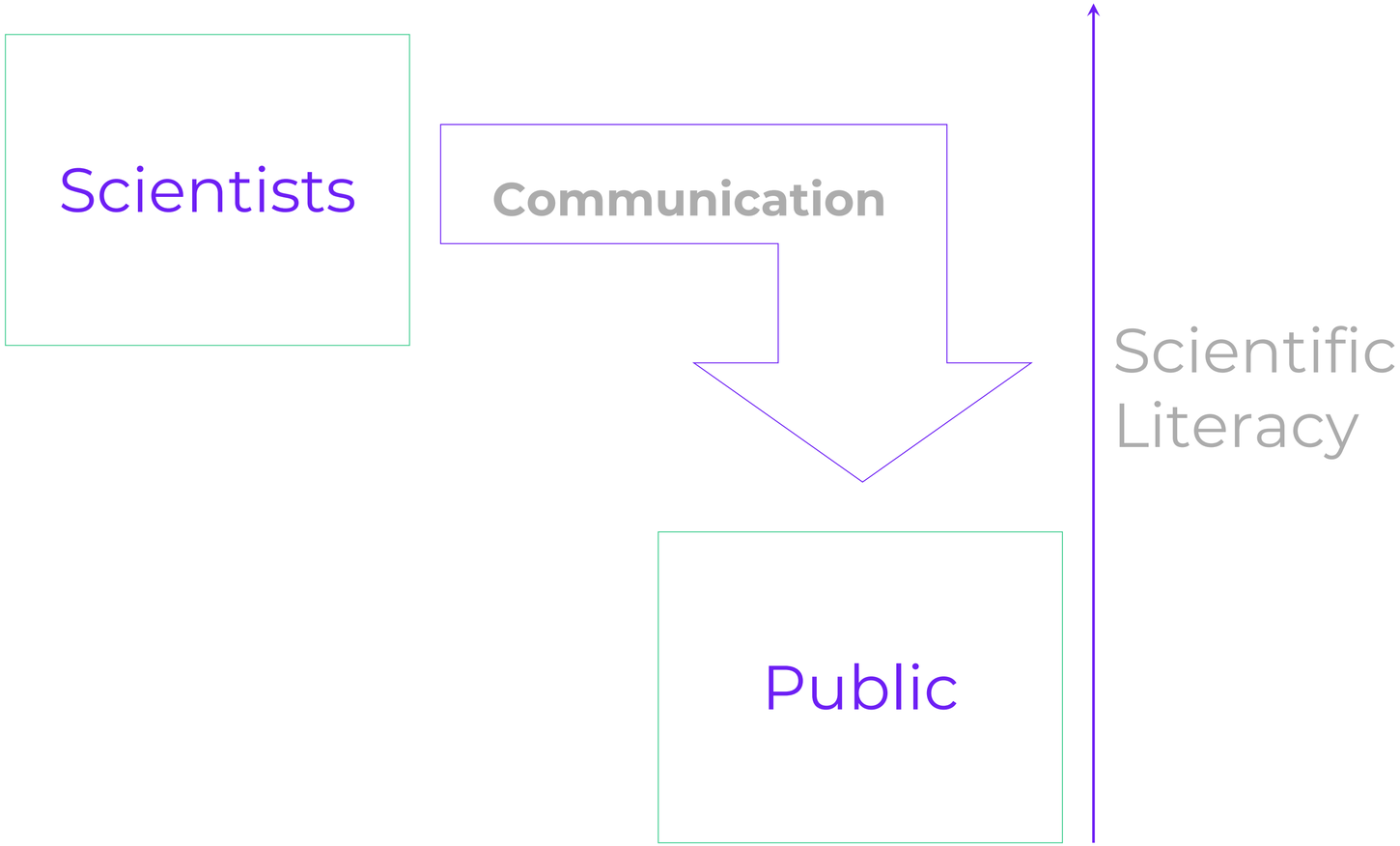
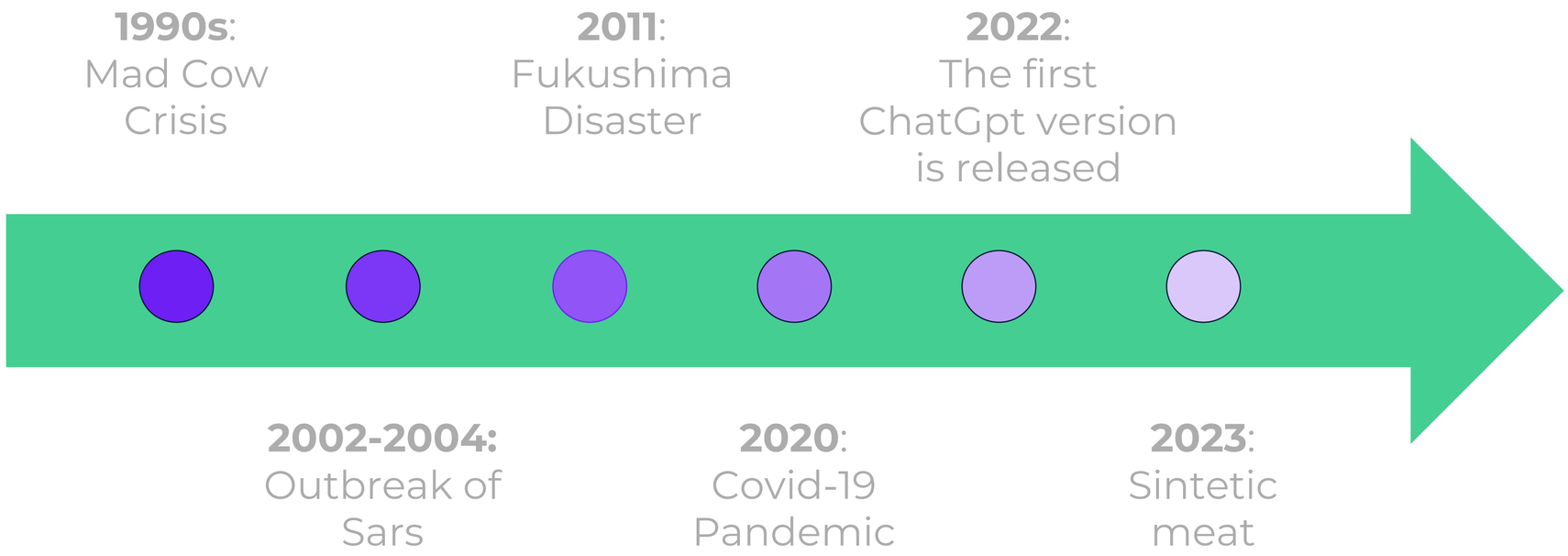
The basics: Science Communication as knowledge transfer



Some events that have changed the recent history of the relationship between science and society



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Different Stakeholders at Play

Role of experts

Is it always the best form of knowledge?

Other forms of knowledge

Research agendas gets influenced by data collected by citizens

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The societal reaction to science depends on multiple psychological, ideological, social factors and **not just on knowledge**

Including the relationship between science and society in **research design** can exponentially increase the impact of such research

Funded by
the European Union

Dialogue between Science and Society in European Research

In **Horizon Europe** (the EU's primary €95.5 billion research and innovation framework), the connection between science and society is embedded across all pillars, throught the following actions:

Open Science Requirements: The program makes open access to publications mandatory. Researchers must use trusted repositories like Zenodo and outline detailed Data Management Plans.

Citizen Science Integration: Actively involving the public in the production of knowledge is encouraged in research design, particularly within the 'Missions' and 'Cluster 2' (Democratic Governance and Cultural Heritage).

The **Science in Society** Hub**:** Features and articles showcasing how research intersects with community hubs and societal progress.

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Dialogue between Science and Society – EU Missions

Large-scale initiatives

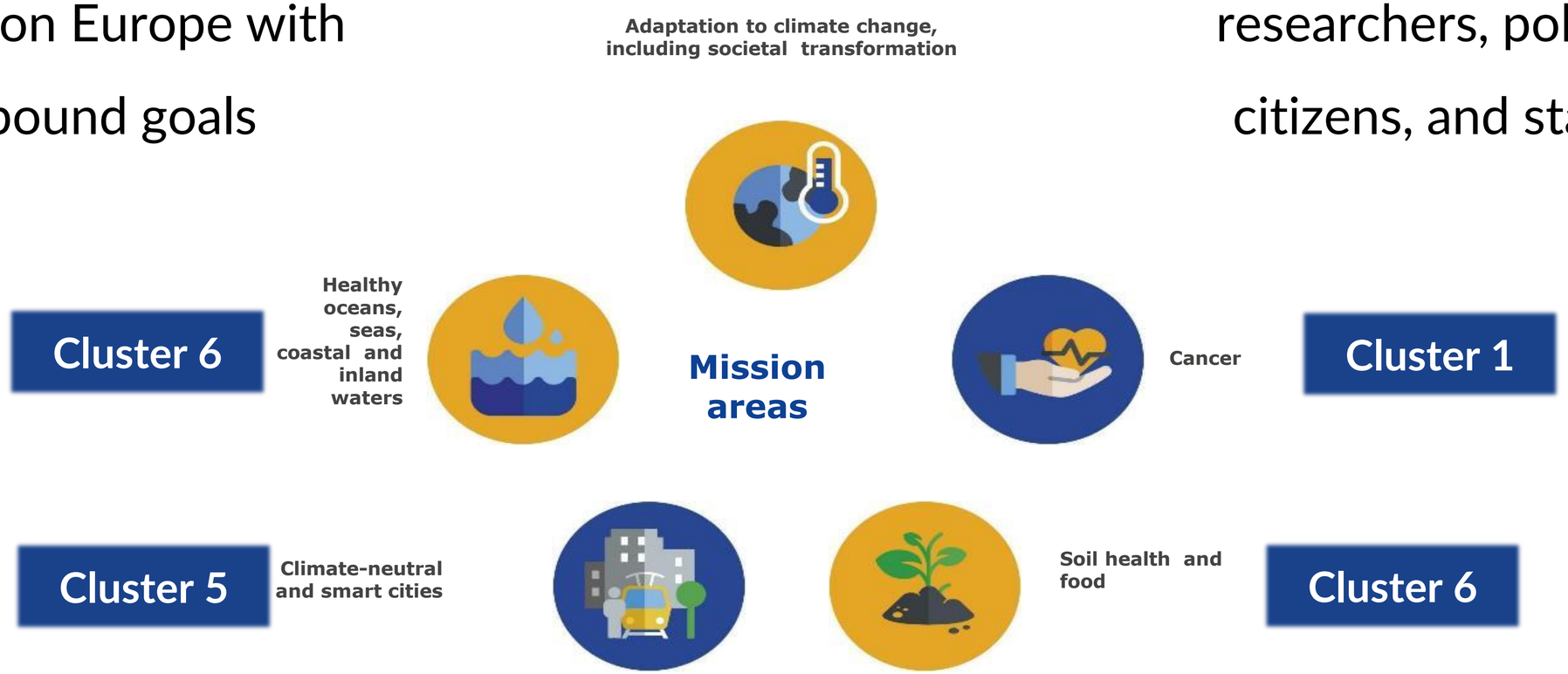
under Horizon Europe with

clear, time-bound goals

Bringing together

researchers, policymakers,

citizens, and stakeholders



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The Engagement Path

Stakeholder

Those who can influence/be influenced by a specific process (be it political, societal, commercial).

Engagement

Different communication practices and actions carried out by an Organization/Project to involve stakeholders and secure their participation or reduce their indifference/ostility.

Multi-stakeholder Process

Process aimed to collect the main stakeholders in a new form of communication, decision making and, possibly, of involvement, aligning expectations and vocabulary.

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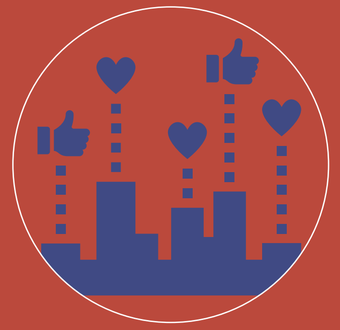
The Engagement Path

Co-Creation

Process where the end-users of the design/created products is put at the center of the creation process, taking an active part in it



Citizen Science

A series of practices to include citizens in research in which they are involved in one or many stages of a scientific investigation, including the assembling of scientific questions, conducting observations, analysing data and using the research results.

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Engagement Path Example – The Pizza Project

How to make the best pizza?

Food critics

Nutritionists and Food scientists

Stakeholder

Pizza chefs

Restaurant owners

Flour and mozzarella suppliers

Public health authorities

Tasting sessions

Forms to share preferences and expectations

Engagement

Receipe development and sharing

Info Days

Multi-stakeholder Process

Roundtable on:
«What makes a ‘best’ pizza»?

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Engagement Path Example – The Pizza Project

How to make the best pizza?

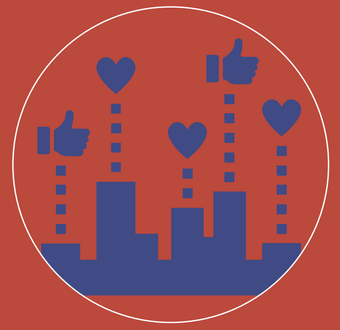
Workshop on co-design of the best pizza:

Which flour is the most sustainable one to use?

Co-Creation

Which receipe is best in terms of nutritional value?

Which toppings and packaging are preferred by consumers?



Citizen can help providing insights on the best pizza:

Citizen Science

Testing different pizza recipes and rating them

Providing feedback on digestibility and satisfaction

Participating in large-scale taste-testing campaigns

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The importance of Storytelling

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Why should we care?

STORIES

*First codification of the oral transmission in order **to keep its emotional value**, indipendently from the fine details*

Every story is a different preservation of a tribal tradition and identity (rituals, signs, dances)

Neurobiologically stories are an «optimization» strategy to circumvent limited memory

VOICE

Spontaneous and fast

Can transmit tone and intention (and receive instant feedback)

Every iteration of the same speech is changed

Storytelling creates the bridge between emotions, memory and content→
Best and durable
Engagment

WRITING

Knowledge preservation indipendently from memory

No need of redundance

Slower and fruible while alone

Opens to reasoning and avoids the need for active participation

Stakeholder Engagement

Stakeholder Engagement: The Context

"Early and continuous engagement of stakeholders is essential for sustainable, desirable and acceptable innovation"
(Rome Declaration, European Union 2014).

Stakeholder engagement has become **part of EU decision-making** as an approach that can improve policy legitimacy and the allocation of research funding.
Stakeholder engagement is also central in documents such as **the Horizon Europe Strategic Plan** (second edition, March 2024).

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Horizon Europe and stakeholder engagement

The Horizon Europe Strategic Plan 25-27 itself is the result of a series of intensive co-creation activities **between Commission services and co-design with Member States, Members of the European Parliament, stakeholders and citizens at large**. This took place through successive rounds of **public consultations, web surveys and interactive workshops**, especially during the annual Research and Innovation Days.

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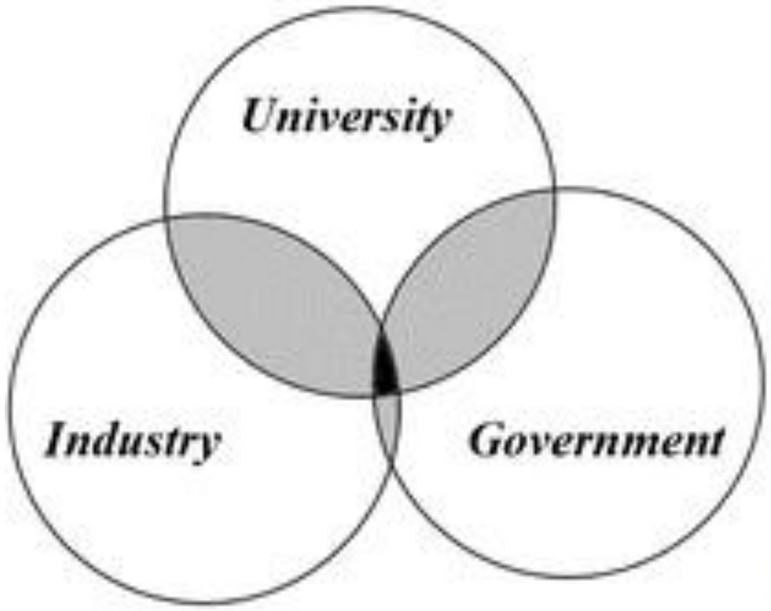
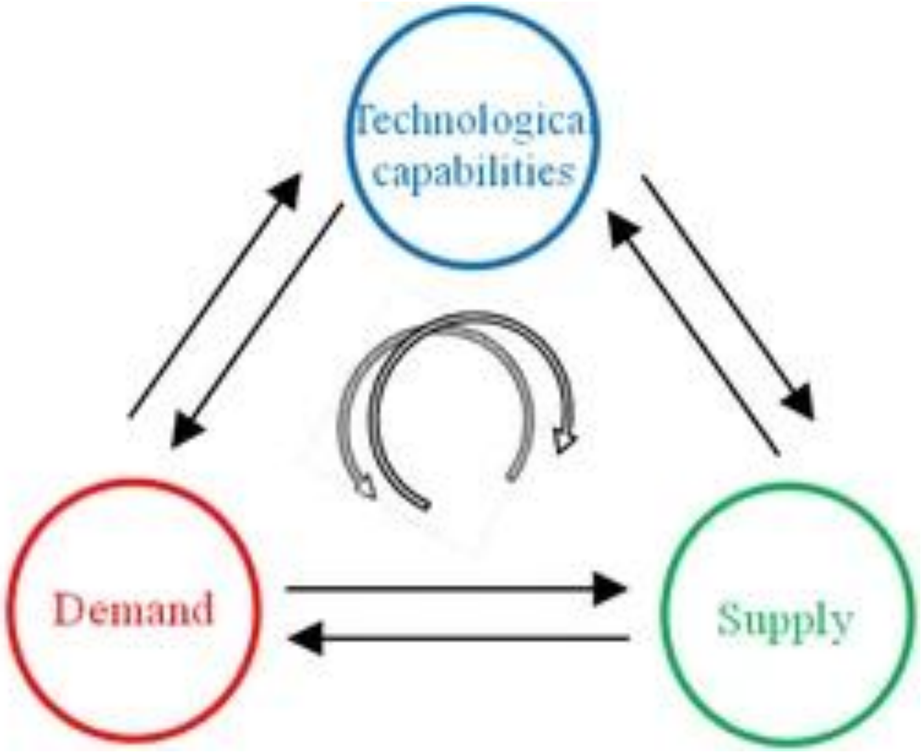
Who are the stakeholders?

Triple Helix Model of innovation, focusing on relationships between academia, industry and politics.





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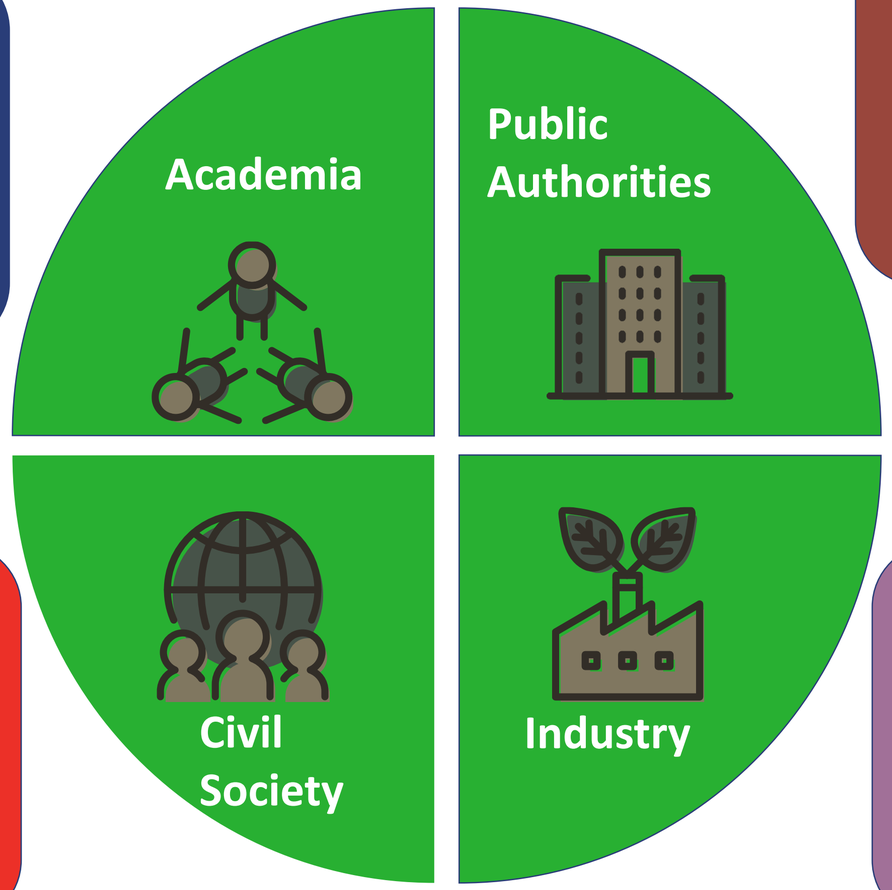
Quadruple Helix Model

Academia
Schools, Universities, Research Institutes, innovation labs from public, private or civil sectors

Public Authorities
Administrations, national, regional and local, intragovernmental organizations, competent authorities (ministries and agencies)



Citizens and Civil Society
Both non-formal ‘no profit’ organizations (ONG, foundations, associations, social entrepreneurs) and communities, citizens, informal and less organized movements and groups

Industry
Firms, companies, entrepreneurs, SMEs, corporations, other profit-making organizations operating in the market, including the ICT and technology business sectors

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Multi-Actor Approach in European Projects

The research and innovation process cannot remain closed in a bubble; to be impactful, accepted and shared it must engage with different actors (-> triple, quadruple, quintuple helix models).

- The multi-actor approach (MAA) is a collaborative and participatory method that involves different stakeholders or actors in addressing complex issues.
- MAA aims to create more demand-driven innovation through the involvement of various actors throughout all phases of the project *(mainly embedded in CL6 in Horizon Europe)*.
- MAA generates innovative solutions that are more likely to be implemented through cross-fertilisation of ideas among actors, co-creation and the generation of co-ownership of final results and, thereby its outcomes more co-owned, reliable, demand-driven and relevant to society.

https://premiere-multiactor.eu/maa/

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Stakeholder Engagement Plan

- Objective identification → Why we do need stakeholder?
- Stakeholder identification and classification
- Engagement
- Monitoring

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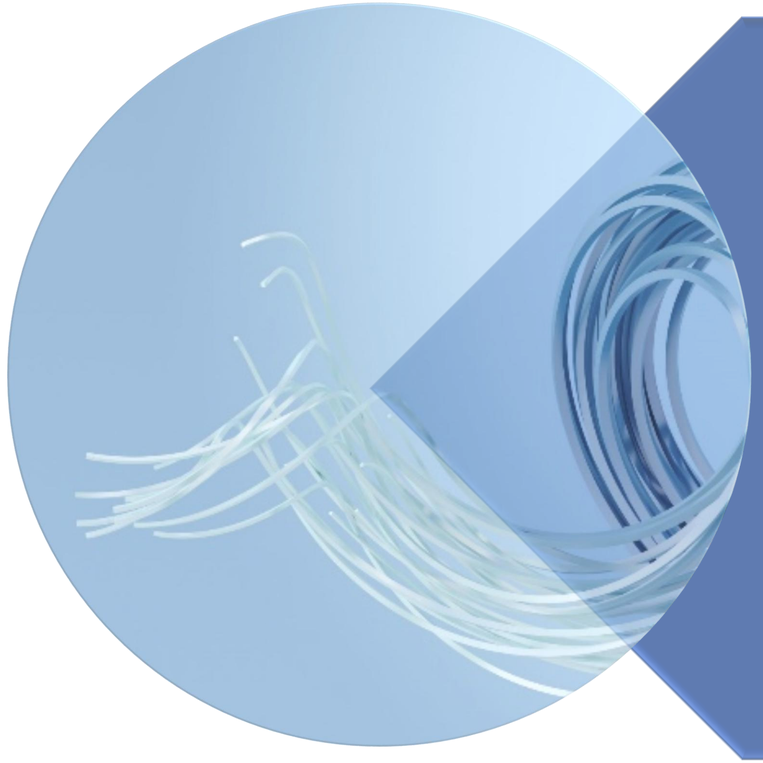
STAKEHOLDER ENGAGEMENT



What I want from my stakeholders?
Possible **objectives**:

- Gain feedback/consensus/acceptability on ideas and solutions
- Learn from others
- Get help and support and share knowledge together
- Identify ideas for solving complex problems and social needs
- Co-create solutions, experiment with alternatives, and innovate together

Effort

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STAKEHOLDER ENGAGEMENT

Variables to consider when building a strategy:

Needs and problem analysis (complex problem or not?)

Do you really need a stakeholder consultation (objectives)?

At what stage of the process does it make sense to involve stakeholders?

Degree of involvement

How many people should/can you involve? Do you have the resources to manage this involvement?

How will I use the results obtained? How “Open” will be the outputs?

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Stakeholder Engagement Plan

- Objective identification
- Stakeholder identification and classification→ Who are the right stakeholders for carrying out my objective?
- Engagement
- Monitoring

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Main steps

Identification

Classification

Contacts Collection

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Stakeholder Identification

- This phase includes creating **a shared list of all parties directly or indirectly affected** by the organization/project's activities.

- Classifying stakeholders according to different criteria (external and internal, primary and secondary, and so on), and **identifying their expectations and interests** are also objectives of this phase.

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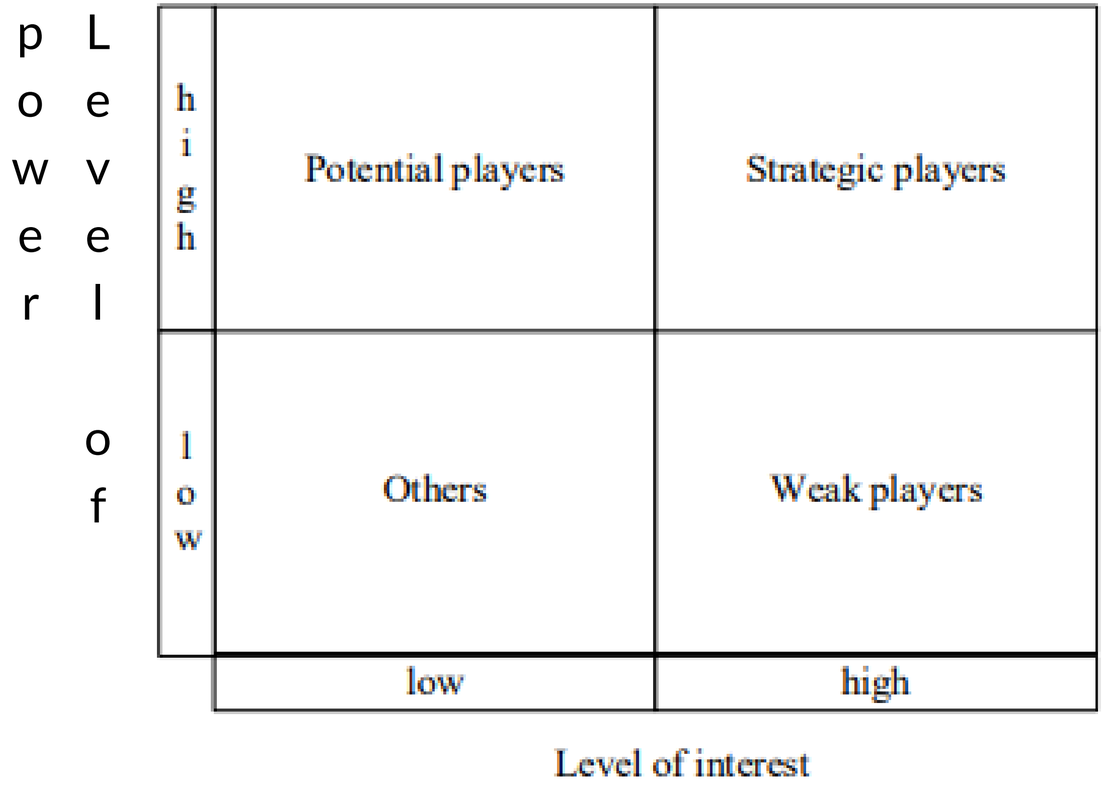
Stakeholder Classification – the Mendelow matrix (1991)

The Mendelow matrix is one of the basic methods for stakeholder mapping. Power and interest are two key characteristics of stakeholders.

Stakeholder power derives from their **ability to influence** the organisation's strategies or resources.

Their **willingness** to do so determines interest.



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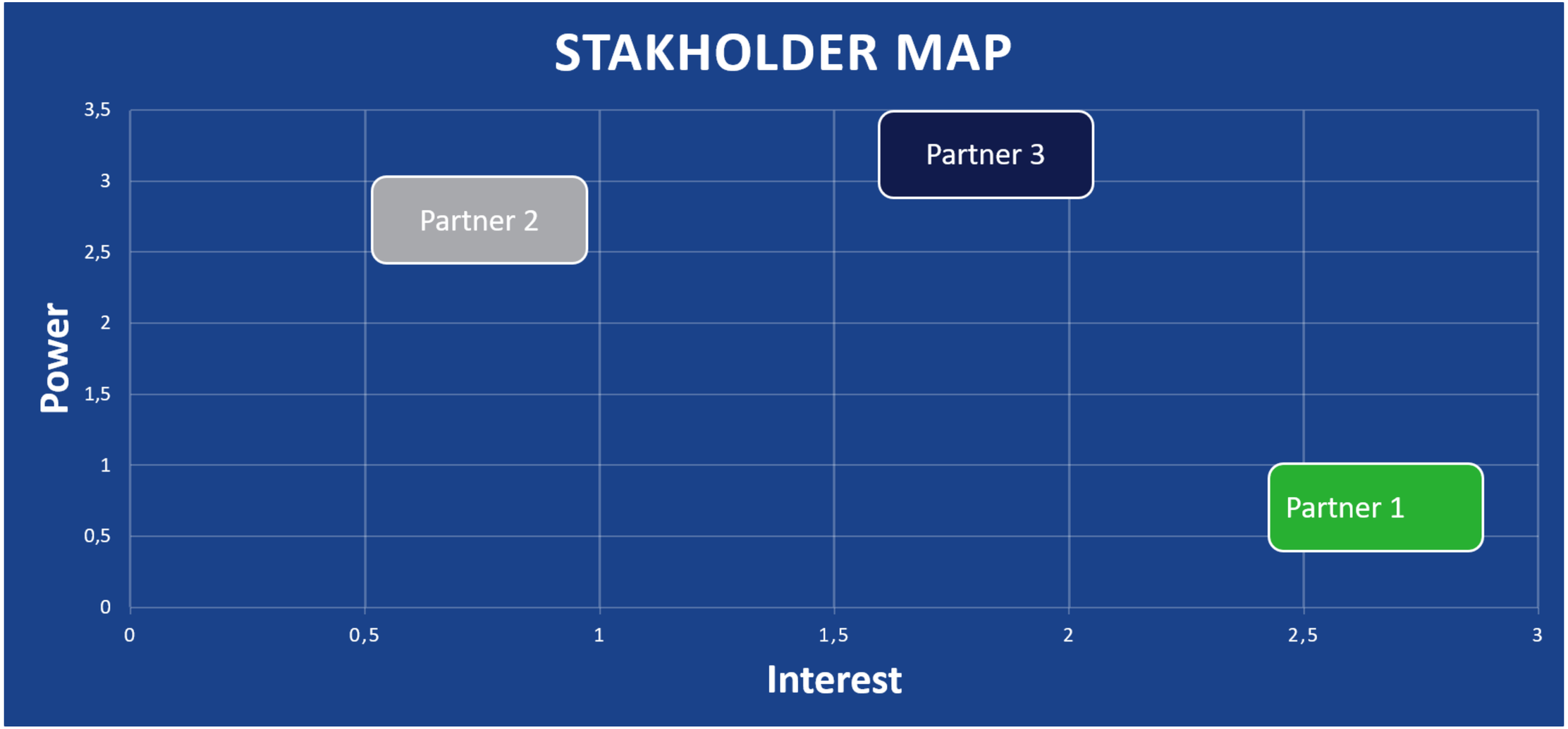
STAKHOLDER MAP
Power
Interest
3,5
3
2,5
2
1,5
1
0,5
0
0
0,5
1
1,5
2
2,5
3
Partner 2
Partner 3
Partner 1

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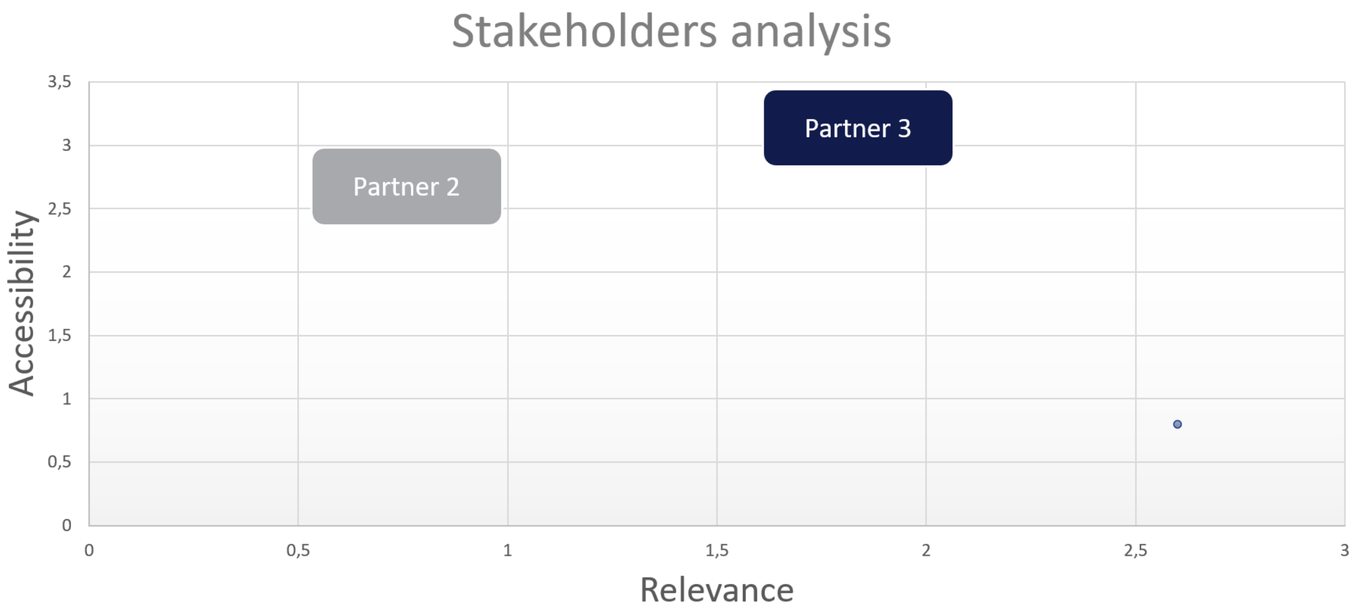
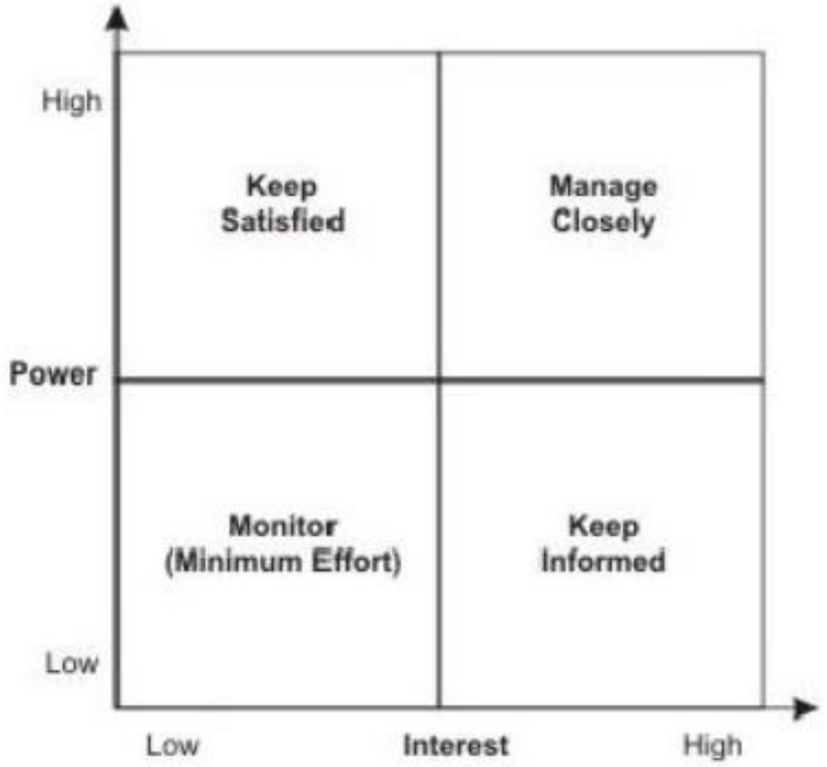
Matrix Visualisation

- The application of the Mendelow matrix classifies stakeholders into four groups. A different strategy should be used for each.





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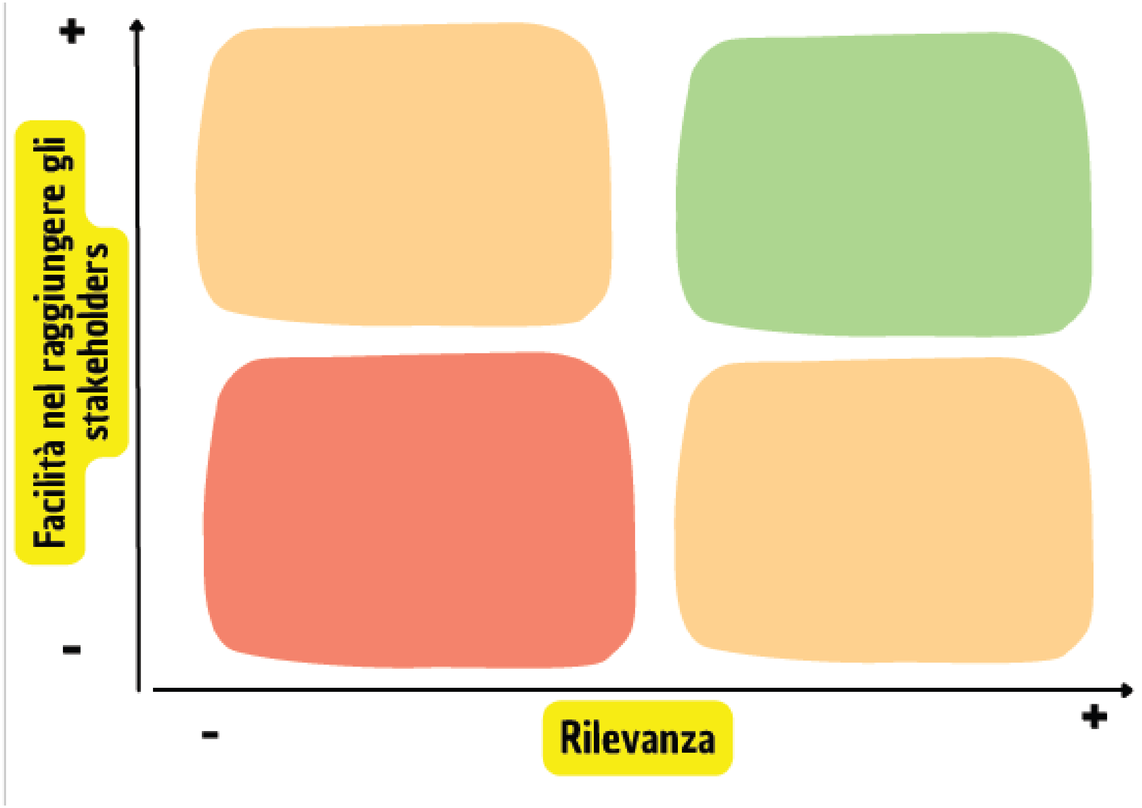
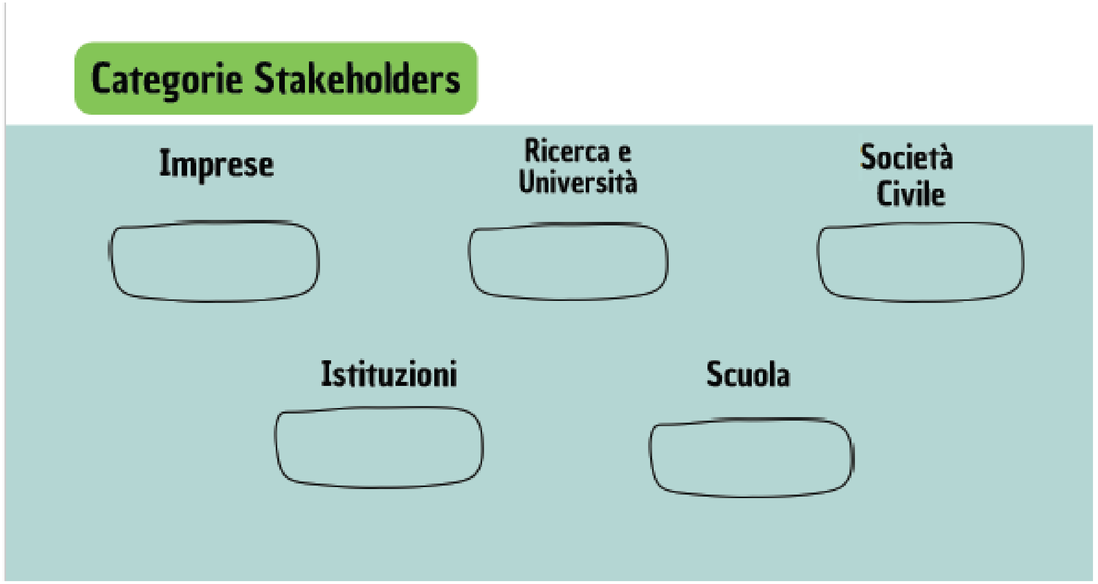
The Pizza Project – Stakeholder Mapping





https://miro.com/app/board/uXjVHEAlnF0=/?share_link_id=926568862964

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Stakeholder Engagement Plan

- Objective identification
- Stakeholder identification and classification
- Engagement → How we will work with stakeholders?
- Monitoring

02.

Participatory Approaches

Co-Creation Methods

Participatory Approaches:

- Living Labs
- Community of Practice
- Events
- Workshops (Mobilization and mutual learning)

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Living Labs (LLs)

Description: A Living Lab develops solutions in a co-creative way, involving actors in **real-life territorial contexts to achieve large-scale impact.**

Objective: to test the feasibility and usefulness for end users (citizens, businesses, beneficiaries, etc.) of a new technology.

Pros: advanced level of participant knowledge, long-term continuity and repeatability.

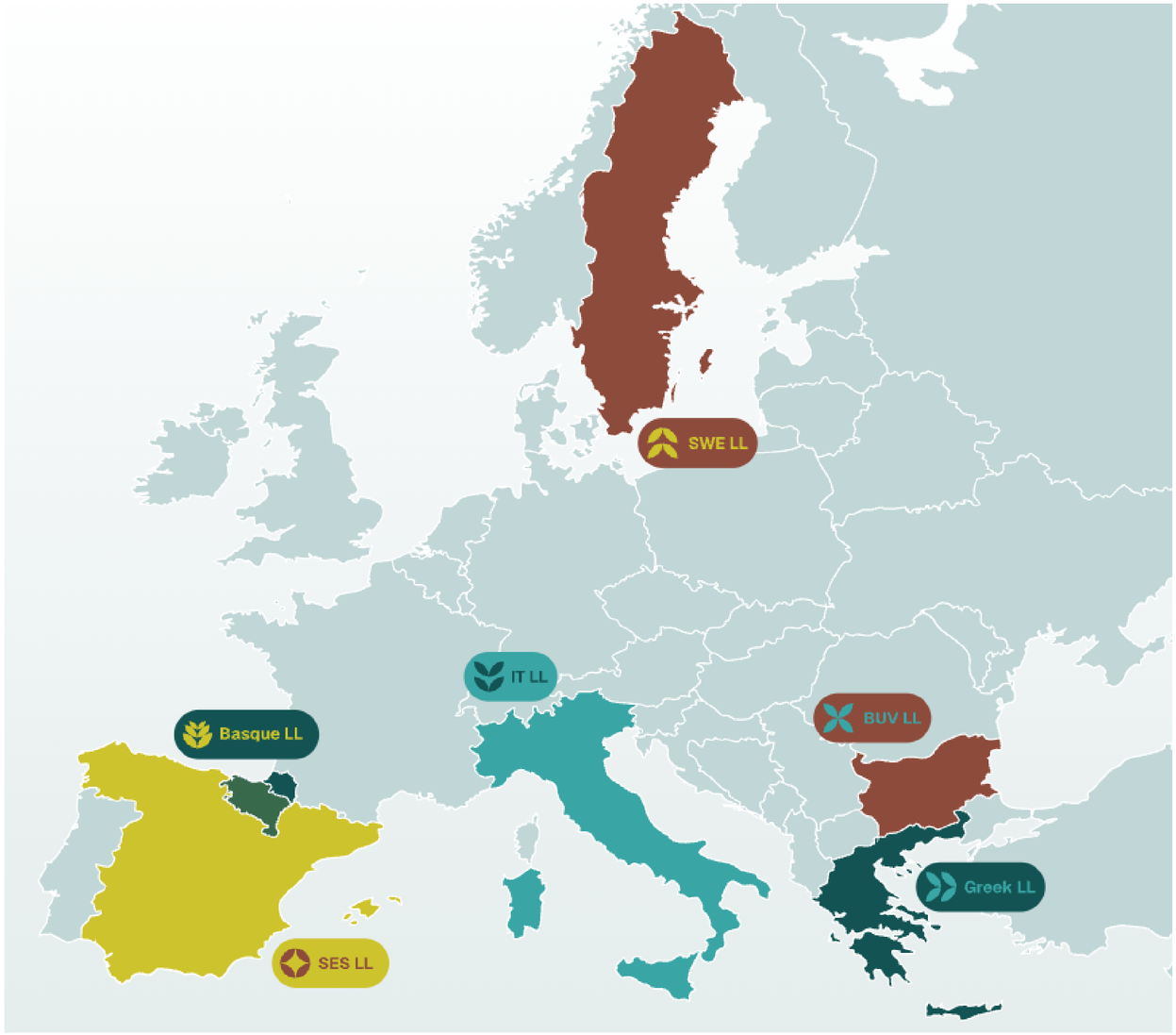
Cons: High effort and resources needed,

Required elements: an online working structure (**common desk**), and **a facilitator** who keeps the process on track over time and organises meetings and objectives.

Living Lab Example:

The iCOSHELLs project supports the EU Mission ‘A Soil Deal for Europe,’ aiming to restore healthy soils by 2030. Specifically, iCOSHELLs focuses on three key objectives: **reducing soil pollution and promoting restoration**, **improving soil structure and biodiversity**, and **increasing soil literacy among society**.

To achieve these goals, iCOSHELLs leverages **six Living Labs** These labs bring together diverse local stakeholders to co-design and test practical strategies for soil health improvement.



6 Living Labs across Europe

From Northern to Southern Europe, these Living Labs serve as real-world testing grounds for innovative soil solutions. Through collaboration and knowledge-sharing, they drive sustainable practices that benefit both local communities and the environment.

Basque Soil Health Living Lab (Basque LL)
Basque Peri-Urban

Bulgarian Viticultural Soil Health Living Lab (BUV LL)
Bulgaria Agriculture

Greek Mine Soil Health Living Lab (Greek LL)
Greece Post-industrial

Italian Soil Health Living Lab (IT LL)
Italy Agriculture

Southeastern Spain Living Lab (SES LL)
Spain Agriculture

SWEdish Soil Health Living Lab (SWE LL)
Sweden Agriculture

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https://www.icoshells.eu/

Living Lab Example:

Methodology

Management | WP6

PHASE 1
Setting up of ICOSHELLS process

- Stakeholder mapping. motivations and recruitment
- Baseline and regional ecosystem analysis and definition
- Soil monitoring methodologies, indicators and web application.
- LLs process refinement, set up and stakeholder activation
- LLs and LHS success factors

WP1, WP3

PHASE 2
LL implementation

- Co-creation with stakeholders
- Solution development: refinement of ideas, prototype developments, testing and experimentation
- Open Calls and expansion of the considered solution
- Community awareness and engagement

WP1, WP2, WP4

PHASE 3
LLS Monitoring and assessment

- Training of predictive modelling of soil indicators
- Socio-economic feasibility and environmental assessment of solutions
- Selection of best performing solutions
- Identification of sites that can be transformed into LHS
- Monitoring and assessing the LLs process & drawing operational lessons learned

WP3, WP5

PHASE 4
Best practices, LL long-term sustainability & solutions replication & upscale

- LLs and LHS best self-sustaining practices
- Replication, scaling up & long-term sustainability of solutions
- Transfer of knowledge and capacity building
- Soil indicators prediction tool

WP5, WP6, WP7

Actors engagement and involvement | WP1, WP7

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https://www.icoshells.eu/

People and Roles in Living Labs

A Living Lab does not manage itself.

Even though it is a participatory process, it is necessary to establish **Governance** (who does what)
Communication methods
Frequency of onsite and online meetings
Format of the final outputs

Who to involve and how

The level of stakeholder involvement is **high**: include them in the project as partners or consider a subcontracting mechanism.

Do not create everything from scratch: it is much easier to involve **organisations already active in the territory**, provided they have a test-bed dimension.

https://enoll.org/

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Participatory Approaches:

- Living Labs
- Community of Practice
- Events
- Workshops (Mobilization and mutual learning)

Community of Practices (CoP)

Description: A CoP brings together a group of expert stakeholders who share the same role, a passion, similar challenges or, more simply, an interest in the same topic.

Objective: In an HE project, the CoP can give **external input** to the consortium to improve the progress of the research, or **validate results** based on its own experience. The objective can also be defined during project implementation.

Pros: advanced level of participant knowledge, effort required from the CoP is sustained (but with low frequency) throughout the project.

Cons: Engaging stakeholders throughout the whole project can be challenging.

Required elements: Some continuous follow-up tools can be used, e.g. a LinkedIn group, a dedicated space on Teams, or in-person meetings to strengthen participation.

Community of Practice (CoP)

«Communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly». (Wenger et al., 2002).

In real life, what could a CoP be?

- Case 1: a group of marketing experts attending an industry conference for a series of presentations and workshops.
- Case 2: a group of mathematics teachers who meet regularly to share new teaching methods and educational resources in order to improve teaching and learning in their school.
- Case 3: UPS couriers are advised, as a workplace policy shortly before lunch break, to look for other couriers and have lunch together.

Community of Practice Example:

FOODCOST
Redefining the value of food

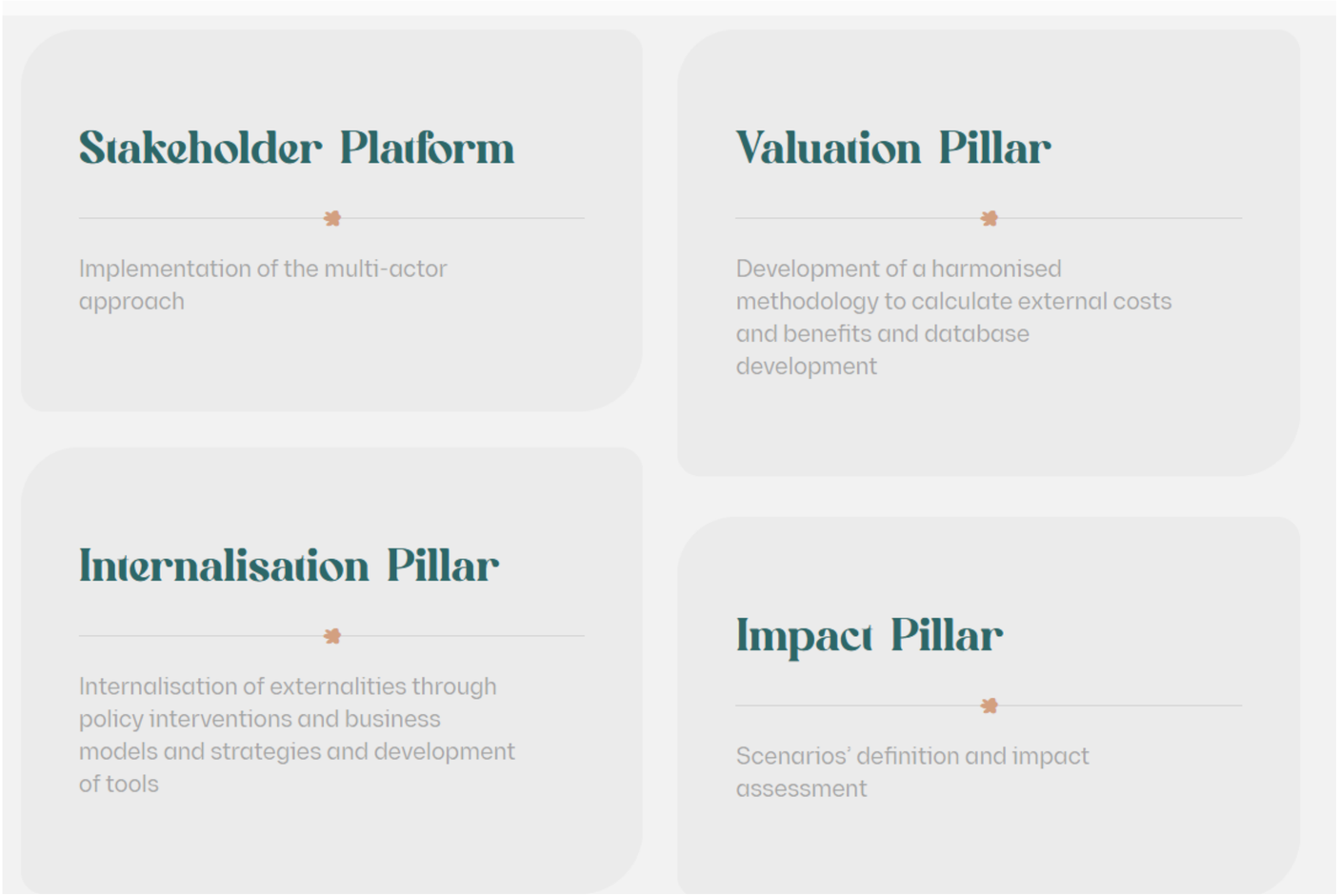
FOODCOST OBJECTIVES:

Build a **Stakeholder Platform** supporting the transition towards a sustainable food system.

Create a harmonised methodology for the **Valuation** of externalities and an EU-global database of externality data.

Develop a framework for the **Internalisation** of externalities through policies and business models and strategies.

Assess the **Impact** of internalising externalities and outline the FOODCoST roadmap.



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https://www.foodcost-project.eu/

Community of Practice Example:

FOODCOST
Redefining the value of food

- APRE WP Leader for the creation of a CoP
- Field experience:

The topic was **too innovative and specific to build a solid base of expert participants**. The number of people working on this topic was still very low, but we needed at least 30 participants.

Result: not everyone knew what the project or the main topic was, and this, despite the first meeting being in person, did not bond the group.

It takes time to build a CoP and often actors join gradually.

It is difficult **to achieve a balanced distribution, especially when the topic is in a field where research is still far behind and little known**.

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https://www.foodcost-project.eu/

Community of Practice (CoP) Tips and tricks

- Identifying and **selecting members** through invitations and a form to assess their knowledge of the topic and genuine interest.
- Define from the outset **the objectives of both the CoP and each meeting**, as well as KPIs, and allocate a budget.
- **ONSITE meetings** to consolidate the group.
- Communication channel: **LinkedIn group** (a mix of formal and informal) to reach them more easily.
- **WIFM – "what's in it for me"**: networking opportunities with European actors.

Community of Practice succeeds only with KPIs and Budgets — Voluntary participation does not produce results!

Naguib Chowdhury
Corporate Innovation | Knowledge Management | Organizational Learning | Change Management | MBA-IE Business School

31 articoli + Segui

7 dicembre 2023

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Participatory Approaches:

- Living Labs
- Community of Practice
- Events
- Workshops (Mobilization and mutual learning)

Mobilization and Mutual Learning

Description: Participatory processes to mobilise relevant actors around a specific societal or scientific challenge, facilitating mutual learning between participants with different backgrounds and perspectives; these workshops are particularly useful in contexts where interdisciplinary and cross-sector cooperation is needed to address complex issues.

Objectives:

- Identify ideas on how to solve complex problems and social needs.

- Co-create solutions, test alternatives, innovate together.

- Obtain support in sharing knowledge and collectively build knowledge.

- Collect feedback on the state of the art.

Pros: simple activities that everyone can do and that easily engage participants. It is a cross-cutting methodology applicable in many contexts.

Cons: limited in time (both duration and repeatability) and shallow discussion.

Required Elements: the Blueprint

Blueprint for Engagement		
A. Context (non-negotiables)		
People	*Place / Logistics*	*Timing*
B. Purpose of the meeting:	**F. Design**	**D. Results to collect** **Tangible:**
C. Key Questions		**Intangible:**
E. Engagement level:		**G. Next steps:**

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Required Elements: the Blueprint

4.3 EXAMPLE OF THE BLUEPRINT FOR ENGAGEMENT AS APPLIED TO A SPECIFIC EVENT

<table>
<tr><td colspan="3">Event: Dialogue session during science communication days, 1st October, Venice</td></tr>
<tr><td colspan="3">A. Context and non-negotiables.
The event is part of a day-long seminar on October 1st held at Ca' Foscari University of Venice. The aim of the day will be about training scientists in being more effective at science communication: the morning will be largely about presentations and experts' views whilst the engagement part will harness ideas for a science communication toolkit</td></tr>
<tr><td>People:

Experts in science communication, people at the intersection between science and external communication</td><td>Place / Logistics:

Ca' Dolfin Aula Magna seems to be the most likely candidate. Large room that will easily fit the participants. If we want to hang posters or to move people around for small group work, it will take extra preparation as the room is not equipped with small tables, and it would require flipchart stands to put posters up.</td><td>Timing:

The entire day will run from 9am to 5:15 pm, and the dialogue part approximately from 3:45 pm to 5:00 pm</td></tr>
<tr><td>B. Purpose:
The whole day aims at exchanging best practices on science communication. The participatory part aims at clarifying tangible insights as input for a science communication toolkit</td><td>F. Brainstorm on Design Methodology
1. Patterns circle
Either
A) Group is split in 4's, and to each the question is "given what you heard today, what do these best practices have in common, which could be translated into guidelines for engagement?" Each group after 20 mins of conversation will come up with 4-5 patterns that emerge from the presentations. Later all groups will share their patterns in plenary and post them of a wall to make a comprehensive map visible to all.</td><td>D. Results to collect
Tangible:
A list of common needs and common engagement guidelines at the end of the 60mins conversation</td></tr>
</table>

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CHECKING IN (meta tool)
https://toolbox.hyperisland.com/check-in-questions

In brief	When can it be used? What is it useful for?	Underlying principles / philosophy	Notes on facilitation	Logistics
It is a meta-tool made of introduction questions that can be used in hundreds of different forms. It means intentionally “opening” a meeting and getting everyone to arrive physically and mentally.	To: i) bring the participant's full attention and help them mentally arrive in the meeting; ii) increase awareness of the level of attention and raise it; iii) create collective awareness of how the group is starting.	**It is worth taking a moment for everyone to intentionally arrive in the meeting, as this increases the chances of being present, attentive and aware.**	As a meta-tool, it depends entirely on the specific tool used.	As a meta-tool, it depends entirely on the specific tool used.

WORLD CAFÉ
http://www.theworldcafe.com/key-concepts-resources/world-cafe-method/

In brief	When can it be used? What is it useful for?	Underlying principles / philosophy	Notes on facilitation	Logistics
The World Café is a well-known dialogue format for exploring an important question and **creating/mapping the participants' shared understanding.**	Useful for building shared understanding; for going deeper into an important question whose answer is not obvious or trivial; when the conversation needs to be slowed down; when we want to build knowledge and map consensus around that question.	The knowledge we need is already among us; knowledge emerges when we connect the group in new and creative ways;	**Participants discuss a question seated at tables in parallel conversations, with a designated host for each table. At the end there is a plenary process of shared meaning-making.**	

OPEN SPACE https://openspaceworld.org				
In brief	When can it be used? What is it useful for?	Underlying principles / philosophy	Notes on facilitation	Logistics
Open Space is a form of **mini-conference with parallel sessions** that invites enthusiasm and individual initiative to explore a common topic.	**The agenda is created by the participants**. Useful for exploring **a topic around which there is a lot of energy / enthusiasm (including conflict). Useful for expressing individual ideas and initiatives, allowing the group to self-organise.**	Simple self-organisation rules and timing are provided. **These simple rules act as a minimum container for a co-organisation dynamic.**	It opens in a circle around a common topic. Anyone can "call" a conversation to explore the topic with their idea. Participants choose where to contribute.	

OPEN SPACE		
Context considerations before selecting this tool		
What kind of final output can Open Space be used for? What kind of objectives?	Nature of the discussion, expertise, and complexity of the problem	Nature of participants, more or less homogeneous, and power relations
Not ideal for "informing" participants. Better used to unleash ideas and individual initiatives. For example, to brainstorm substantive ideas, map concrete projects (existing or that come to mind at the time), for instance before co-deliberation.	It does not make sense to use Open Space for a purely technical problem (unless used as a very open brainstorming format to generate divergent ideas). **For a complex problem, Open Space is ideal for diverging and generating a good number of concrete, different options.**	It works best with a variety of participants (homogeneous or not). Since the caller of a specific Open Space session "invites" people to their table, self-selection works well: there is freedom to go to the sessions you want.

CIRCLE DIALOGUE
https://thecircleway.net

In brief	When can it be used? What is it useful for?	Underlying principles / philosophy	Notes on facilitation	Logistics
Circle is a recent formalis	It can help to go deeper into a	Listen without judgeme	The group sits in a	

CIRCLE DIALOGUE

Context considerations before selecting this tool		
What kind of final output can Circle be used for? What kind of objectives?	Nature of the discussion, expertise, and complexity of the problem	Nature of participants, more or less homogeneous, and power relations
Ideal for dialogue: to	Ideal for complex, thorny problems	It can be used with

NOMINAL GROUP TECHNIQUE https://asq.org/quality-resources/nominal-group-technique

In brief	When can it be used? What is it useful for?	Underlying principles / philosophy	Notes on facilitation	Logistics
NGT is a	For example	Starting with	It starts with a	

SILENT MIND MAPPING

https://www.mindsettlers.com/guide/AjqsZ0tk3Y6aEWwkEqqYW

In brief	When can it be used? What is it useful for?	Underlying principles / philosophy	Notes on facilitation	Logistics
Mind mapping allows a group to explore a question with individual reflections in a collective writing process.	When a team wants to collect individual and collective reflections on a topic, for example to take stock of “what have we learned?” “what new insights are emerging from our meeting?” etc.	**The overarching question/topic is left in the centre of a large flipchart**, with the idea of allowing time for introspection to write individual reflections and co-create shared meaning.	It starts with a question in the centre of the flipchart, which everyone begins answering by writing on the same sheet in complete silence. **Over time connections between ideas may emerge, and these should be highlighted.**	

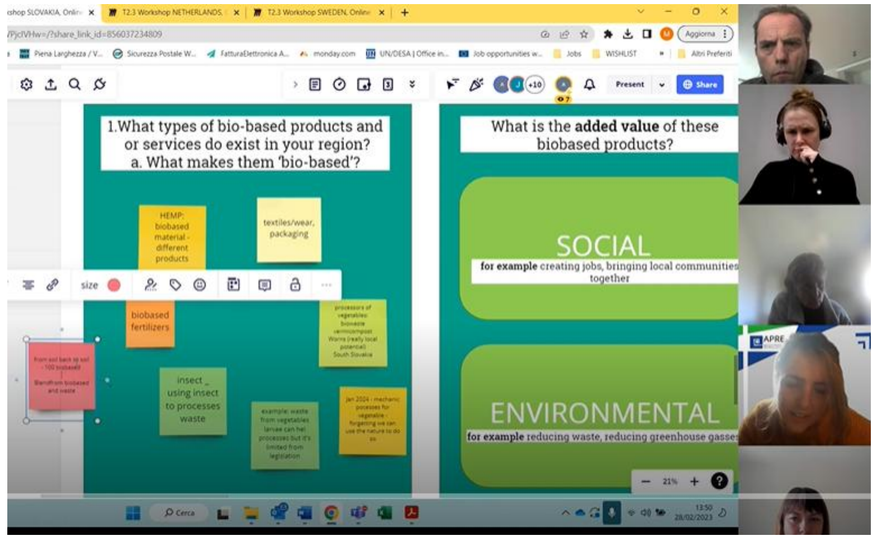
SILENT MIND MAPPING

Context considerations before selecting this tool		
What kind of final output can Mind Mapping be used for? What kind of objectives?	Nature of the discussion, expertise, and complexity of the problem	Nature of participants, more or less homogeneous, and power relations
Mainly, MM is used for shared meaning-making: **to reflect and learn, take stock of the situation, visualise the participants' common thinking at that moment**, etc. It could also be used to extract individual quotations (if participants are asked for consent to use their quotes).	**Better suited to complex problems**, for questions whose answer needs to be created together and cannot be predicted in advance. **While the map «sediment» other activities can be carried out.**	It is very important that the sense-making, the creation of meaning and the interpretation of what is written are carried out by the participants themselves. **Silence usually changes power relations.**

ROTATING FLIPCHARTS				
In brief	When can it be used? What is it useful for?	Underlying principles / philosophy	Notes on facilitation	Logistics
Several flipchart stands are placed in different corners of the room. The rest of **the group walks around and takes turns** contributing ideas to each flipchart.	To **generate a large number of inputs, ideas and feedback on a limited set of concrete ideas, topics or projects.** Recommendations, questions, inputs, etc. can be collected.	The hosts of the flipchart stands are encouraged to gather a large number of inputs without judging or responding to them.	The room is divided into different corners, one for each flipchart stand. **Participants are instructed on the type of input to give to the flipcharts and on the timing.**	

Online Workshop Tips and tricks

- Bilateral meetings with scientific part to align expectation and avoid replications
- Include 1-2 keynote speakers between collective activities
- Facilitation Instruments and Quiz/Gamification Moments
  -Miro Boards
  -Mentimeter / Slido
- Quiz (tramite slido/mentimeter)
- Academic stakeholders are more easily involved.
- Brief (2h massimo)
- Need strong moderation for the co-creation and input collection part



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Onsite Workshop Tips and tricks

- Combination with bigger events/project general assemblees (reducing cost and ensuring broader participation)
- Include small budget for participants' travel costs
- Involve sister project to enhance networking and shared visibility
- Co-creation: build groups in advance to ensure heterogenity and representation of different background/expertises
- Detailed agenda of the event… if possible include social activities like trips/sport/games (other than dinners) right after the end of the co-creation.

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Participatory Approaches:

- Living Labs
- Community of Practice
- Events
- Workshops (Mobilization and mutual learning)

Events

Description: Events/Conferences are a communication lever that enables direct contact with internal audiences, dealers, consumers or simple spectators, conveying the reference worlds of a brand or promoter in an innovative way, without intermediaries.

Objective: meeting among stakeholders, networking, field-based encounters, strengthening relationships that may be almost exclusively online, opening up new opportunities. The effects of these events are completely emergent and unpredictable

Types of events: a first broad distinction is between events

B2B: Business to Business – more logic-driven

B2C: Business to consumers – more emotion-driven

Events in Collaborative Projects

Networking Events

- Objective: bring the stakeholders in our network together to create new connections, new business opportunities or new knowledge opportunities.

- Format: usually very informal occasions, but they should be structured with at least a small budget, e.g. breakfasts, aperitifs, coffee breaks. These are placed within larger events as a relaxed social moment.

- Stakeholder engagement level: low
- Stakeholder type: business, industry, citizens

Events in Collaborative Projects

Matchmaking Events (B2B matchmaking, investor matchmaking, business speed dating or brokerage events)

- Objective: targeted and selected meetings with stakeholders in attendance to create business opportunities or expand networks of contacts.

- Format: also included within larger events (e.g. fairs). An online matchmaking platform is needed to schedule and request meetings. Participants are split into tables, with about 15 minutes per bilateral/short group meeting ("B2Bs").

- Stakeholder engagement level: medium
- Stakeholder type: business, industry

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Events in Collaborative Projects

Study visits / Field trips

- Objective: experience experimental work first-hand. A highly impactful experience for participants.

- Format: usually dedicated event. Half day-full day dedicated to interact directly with innovators in the field. Immediate (if unbalanced) networking and think tank.
- Stakeholder engagement level: medium
- Stakeholder type: industry, producers, academia, general public

Addendum:

- Training event: a benefit for participants, learning more about their own sector (with high-profile speakers)
- Success story: selection of success stories/university students/PhD candidates with innovative theses

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The Pizza Project – Co-Creation Methods

Co-creation of the "best pizza" combining food science, sustainable production of ingredients and best cooking techniques

	ONSITE MEETING	WORKSHOP	COMMUNITY OF PRACTICE (CoP)	LIVING LAB
MAIN PURPOSE	Share information, align, solve specific issues	Co-create ideas, explore options, generate solutions	Share knowledge, build capacity, solve problems collectively over time	Co-create, test and validate solutions in real-life settings for impact
STAKEHOLDER INVOLVEMENT	Limited number of key stakeholders	Diverse stakeholders engaged for a specific topic	Open or semi-open group with common interest/practice	Broad and diverse stakeholders including end-users/citizens
TIMEFRAME	Hours to half-day	Half-day to 2 days	Months to years (ongoing)	Months to years (iterative cycles)
COMPLEXITY	★☆☆☆☆ Low	★★☆☆☆ Moderate	★★★☆☆ High	★★★★★ Very High
EFFORT & RESOURCES	●○○○○ Low	●●○○○ Moderate	●●●○○ High	●●●●● Very High
OUTPUT EXAMPLES	Meeting notes, decisions, action points	Ideas, recommendations, prioritized solutions	Shared resources, guidelines, solutions, best practices	Tested solutions, prototypes, validated results, impact on the territory
BEST FOR	Quick alignment, information sharing, specific decisions	Exploring problems, co-designing solutions	Complex topics, continuous learning, community building	Complex challenges, real-life testing, systemic innovation

THERE IS NO "BEST" METHOD.

The key is to match the method with your objectives, context, stakeholders and the stage of your project.

TIP

You can also combine methods (e.g., start with a workshop and continue in a Community of Practice or Living Lab).

03.

Citizen Science

***Mariya Gabriel**, Commissioner for Innovation, Research, Culture, Education and Youth*

"Interaction between citizens, scientists and policy makers is essential to **enrich research and innovation and reinforce trust of society in science.** I am proud of the hundreds of thousands empowered citizens that already contributed to research and innovation in recent years and look forward to continue opening up *(responsable)* research towards society and the world."

https://youtu.be/VlRtCPxrvHk

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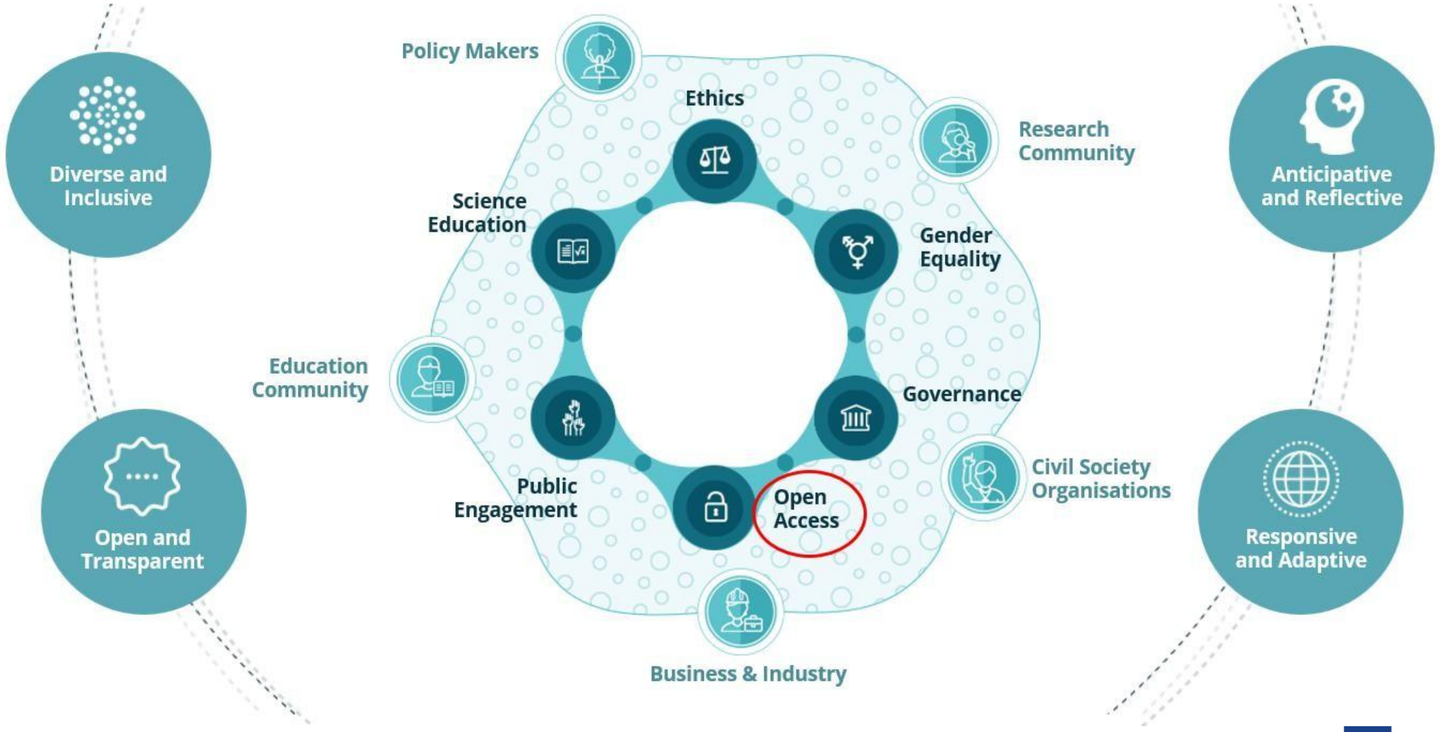
Responsible Research and Innovation, Open Science and Citizen Science

- RRI (Responsible Research and Innovation) aims to align research outcomes with societal needs and ethical considerations, emphasizing anticipation of societal impacts, inclusivity, and responsiveness to public values.



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Responsible Research and Innovation, Open Science and Citizen Science

- Open science promotes the free accessibility of research processes, data, and results, encouraging collaboration across disciplines and with the public.

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Responsible Research and Innovation, Open Science and Citizen Science

- Citizen science actively engages non-professionals in scientific research, ensuring that the public contributes to and benefits from scientific inquiry.

"In 2015, former Commissioner Moedas identified three strategic priorities, described in Open innovation, Open science, Open to the world (the three O's strategy). One important dimension of open science is citizen science and in 2016, the Council recognised citizen science as an open science priority.

Citizen science can make science more socially relevant, accelerate and enable production of new scientific knowledge, increase public awareness about science and ownership of policy making, as well as increase the prevalence of evidence-based policy making."

[EC, Strategy on 3 O's: Open Innovation/Open Science/Open to the World – a vision for Europe]

RRI, OS, CS: ***Share the goal of fostering inclusive, transparent, and socially responsive scientific practices***

Citizen science – The Beginning of the History

Amateur contributions to science

Audubon Society (1905) & Rick Bonney (1996)

- Birdwatchers submitting sightings
- Citizens collecting and analysing rain samples
- ***Participants are "amateur-experts" and/or data collectors***

Democratisation of science

Environmental justice (1970s-) & Alan Irwin (1995)

- Democratic, participatory science
- Science to address the needs and concerns of citizens
- Citizens could develop the process of producing reliable knowledge themselves
- ***Participants can influence and transform science***

Biodiversity monitoring → **CS NOW** ← Activist science
Participatory action research
Community-based natural resource management
Public and Patient Involvement (PPI)

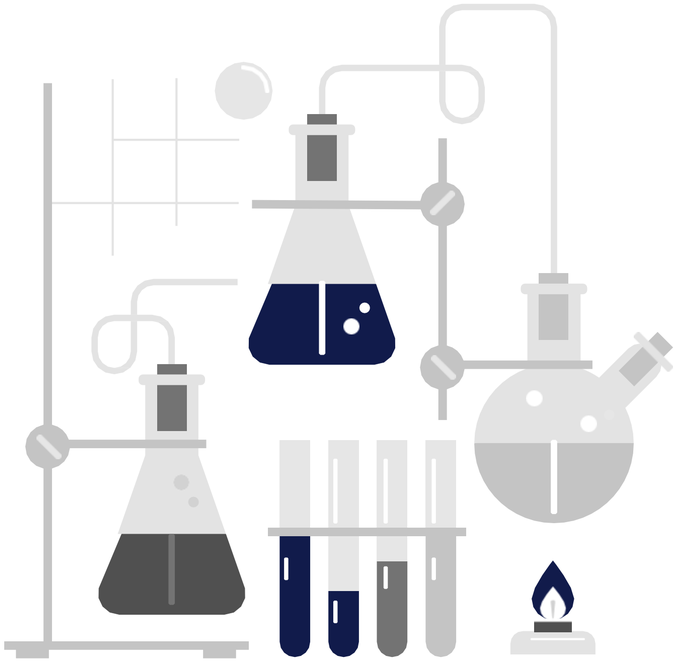
Funded by the European Union
Circle U. European University Alliance

Some characteristics emerging since the beginning

First definition of CS in an issue of the MIT Technology Review in 1989: recruitment of volunteers in acid-rain campaign, to collect acid rain samples, test their acidity and report to scientists. The information were then used to influence the Congress (USA).

What can we learn from this example?

- It includes the generation of scientific data (through the testing of the acidity of rainwater),
- engages volunteers over a large area (the continental USA),
- addresses a politically relevant issue (acid rain and the lobbying process to reduce it).



The essence of Citizen Science

- Citizens are involved in one or many stages of a scientific investigation, *including the assembling of research questions, conducting observations, analysing data, and using the resulting knowledge*

- Researchers or (scientific) institutions can play a leading or mediating role within Citizen Science projects, or no role at all (Extreme Citizen Science)

ecsa | European Citizen Science Association

Citizen science and the involvement of knowledge actors in the co-creation of R&I agendas and contents. 4 May 2021, The Research Council of Lithuania NCPs, Linden Farrer, Policy Officer DG R&I, Open Science – Science and Society

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Why citizen science?

Democratisation of research by engaging the public in scientific inquiry, while generating valuable data for science

- **Expands data collection, analysis and interpretation** – Harnesses the power of large, distributed participation to gather extensive and diverse datasets
- **Enhances public engagement** – Increases scientific literacy and fosters a sense of ownership in scientific discovery
- **Addresses real-world issues** – Tackles environmental, health, and social challenges through community-driven research
- **Bridges science and society** – Strengthens trust and dialogue between researchers and the public
- **Encourages lifelong learning** – Inspires curiosity and critical thinking across all age groups
- **Promotes inclusion and diversity** – Engages people from different backgrounds, bringing diverse perspectives and local knowledge into scientific research

Funded by the European Union

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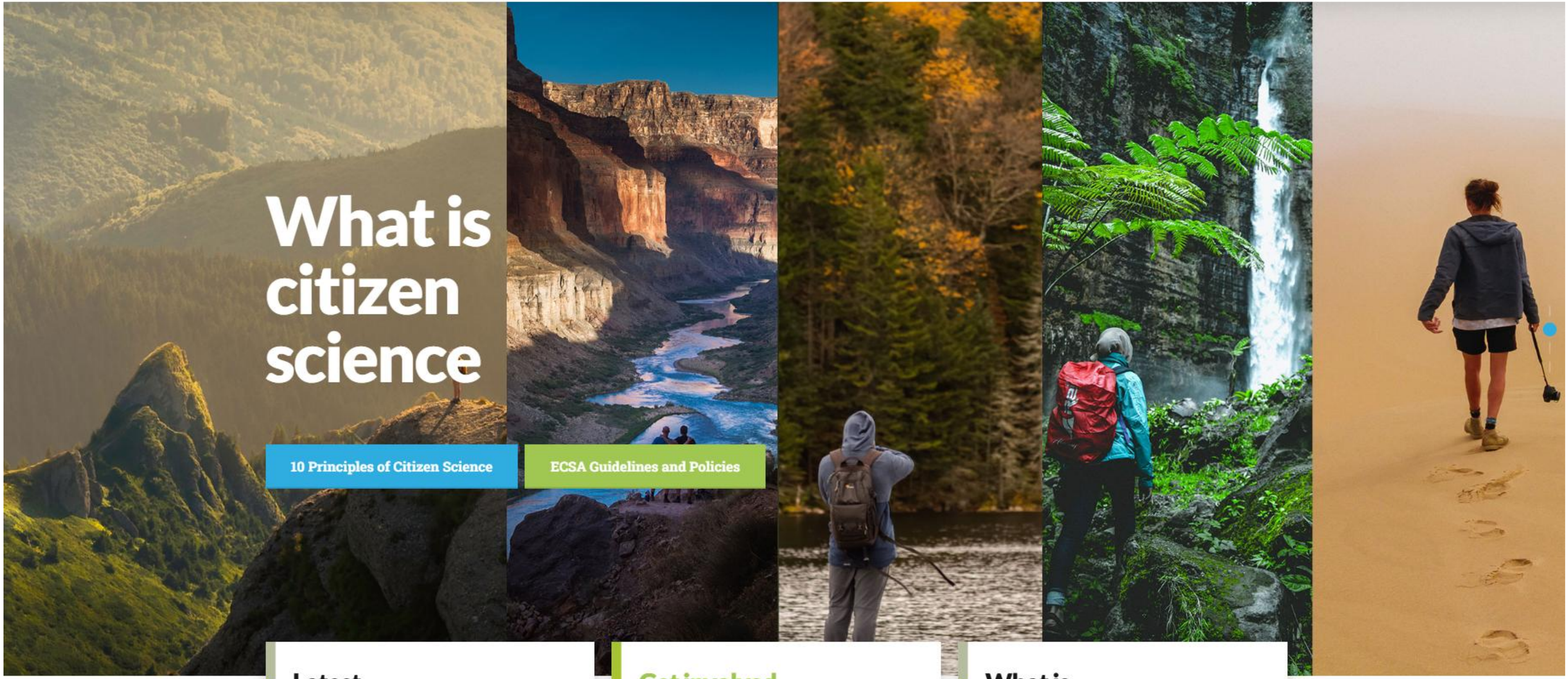

What is citizen science

10 Principles of Citizen Science

ECSA Guidelines and Policies

Latest news

Get informed about our projects
Our upcoming events
Become part of our meetups

Get involved in citizen science

Visit the EU-Citizen.Science platform

What is ECSA

Find out more about citizen science

What is NOT Citizen science:

- **Communication** to promote a topic and raise awareness on a piece of work:
  - Articles in mainstream newspapers and magazines
  - Tv and radio channels

> - *Clear language and attractive scientific subject with outstanding results to catch the media's attention.*
> - *One direction from the sender to the receiver*

- **Outreach** to engage a large audience and to bring knowledge and expertise on a particular topic to the general public:
  - School presentations, Lab visits
  - Workshops, Public talks

> - *To explain the benefits of research to a larger public*
> - *One direction from the sender to the receiver even if with more engagement and intaraction*

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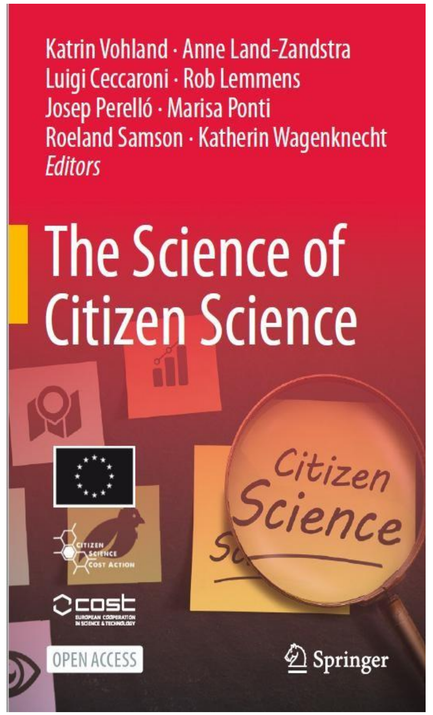
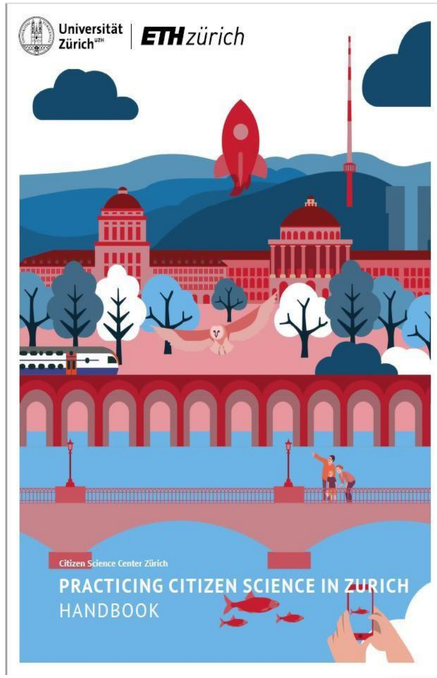
Citizen Science definition

There is no one-size-fits-all approach: it must reflect the objectives of the actors and the extent of citizen engagement in the different processes generating scientific knowledge.

- Citizen science is just one of many ways to include citizens in research.
- It may not be suitable or practical for all scientific purposes and may not always make sense for the research issues at hand.





The Science of Citizen Science, https://doi.org/10.1007/978-3-030-58278-4

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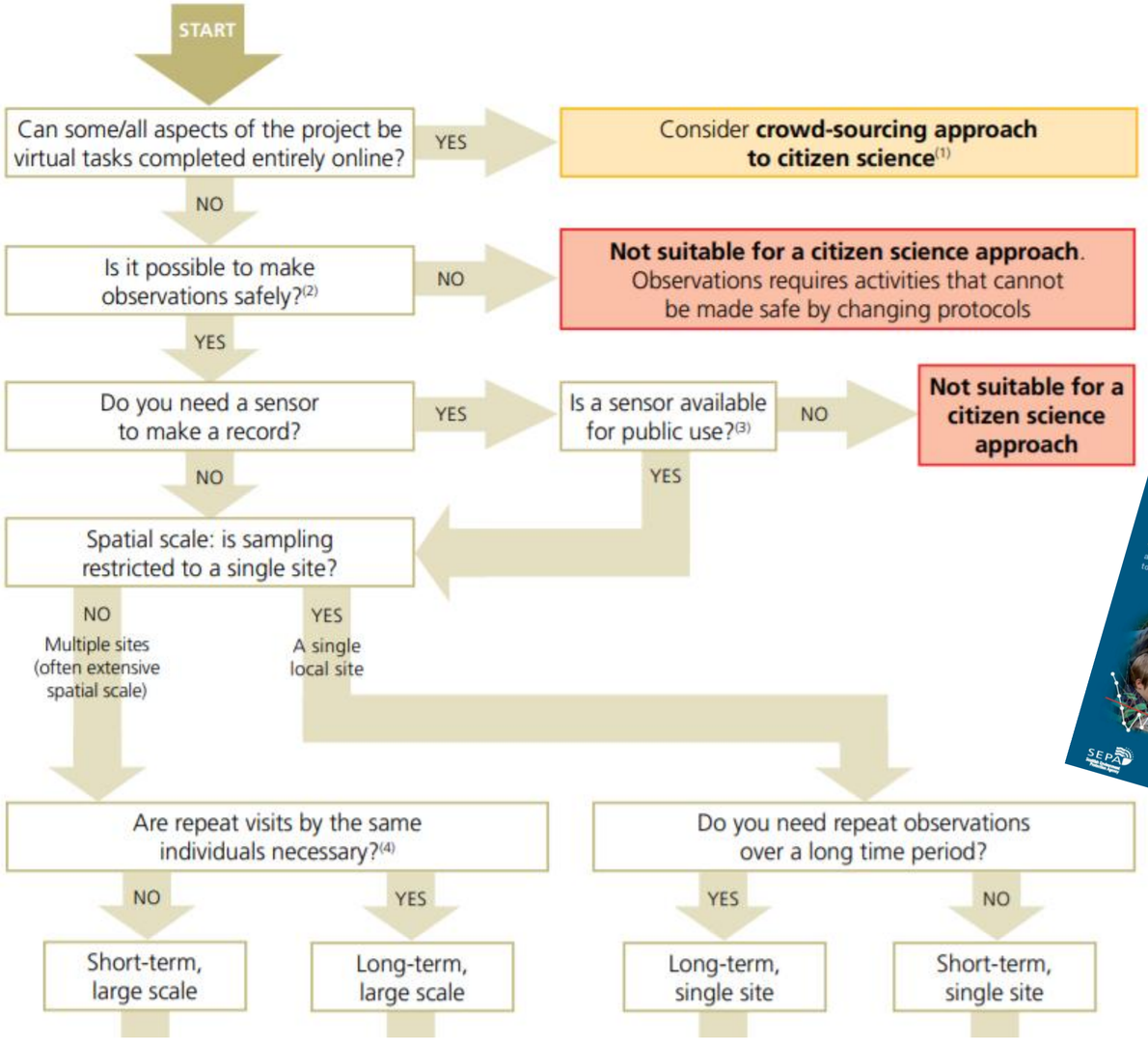
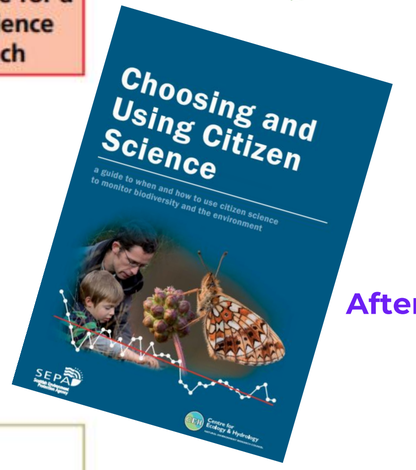
CS is a method like any other scientific method – only use when appropriate!

Part 1 of the decision framework





After the break

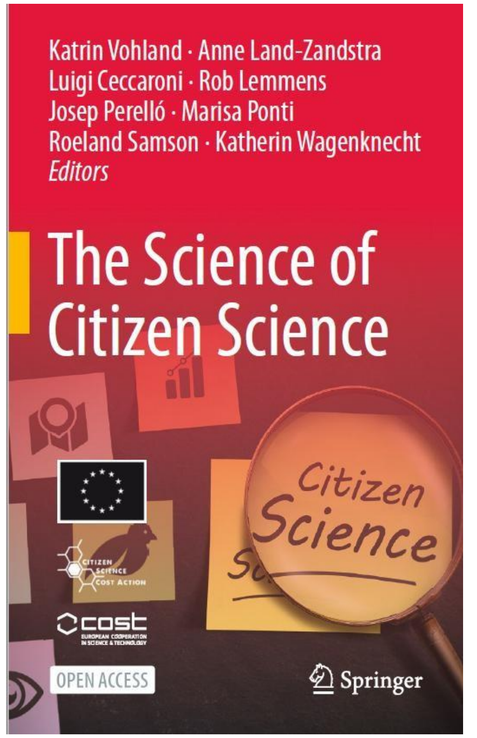
Pocock et al. 2014: https://www.ceh.ac.uk/citizen-science-best-practice-guide

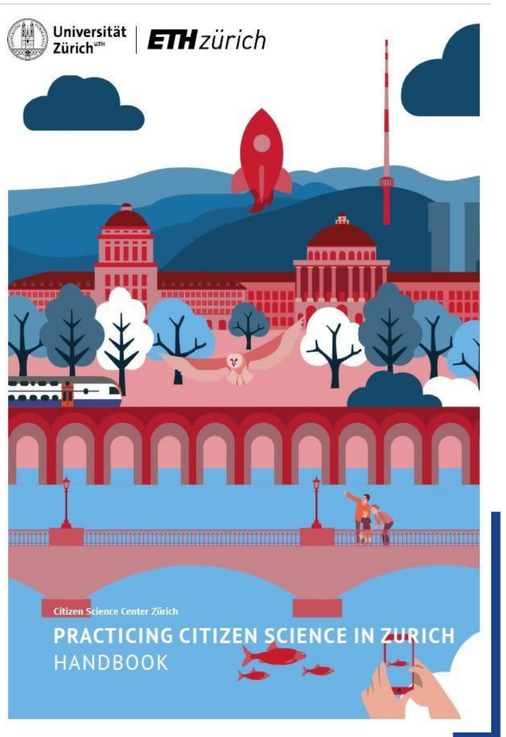
Citizen Science as methodology

Better Science

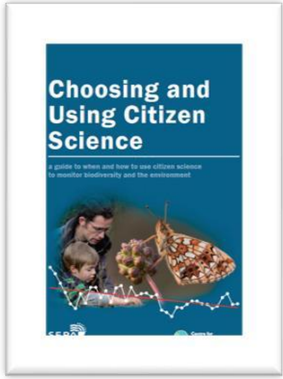
More Democratic Science

- ✓ Data collected from large geographical area and/or for long period are needed ----> data collected from participants can be cost-effective
- ✓ Analysis of large amount of data is needed ----> volunteer thinking approach!
- ✓ Local and/or social impact of the research ----> interdisciplinary collaboration and stakeholders' engagement
- ✓ CS can facilitate the understanding of the scientific question and make it more locally relevant
- ✓ The research requires meaningful engagement in real life to analyse individuals on specific aspects (e.g. triggering behavioural changes)

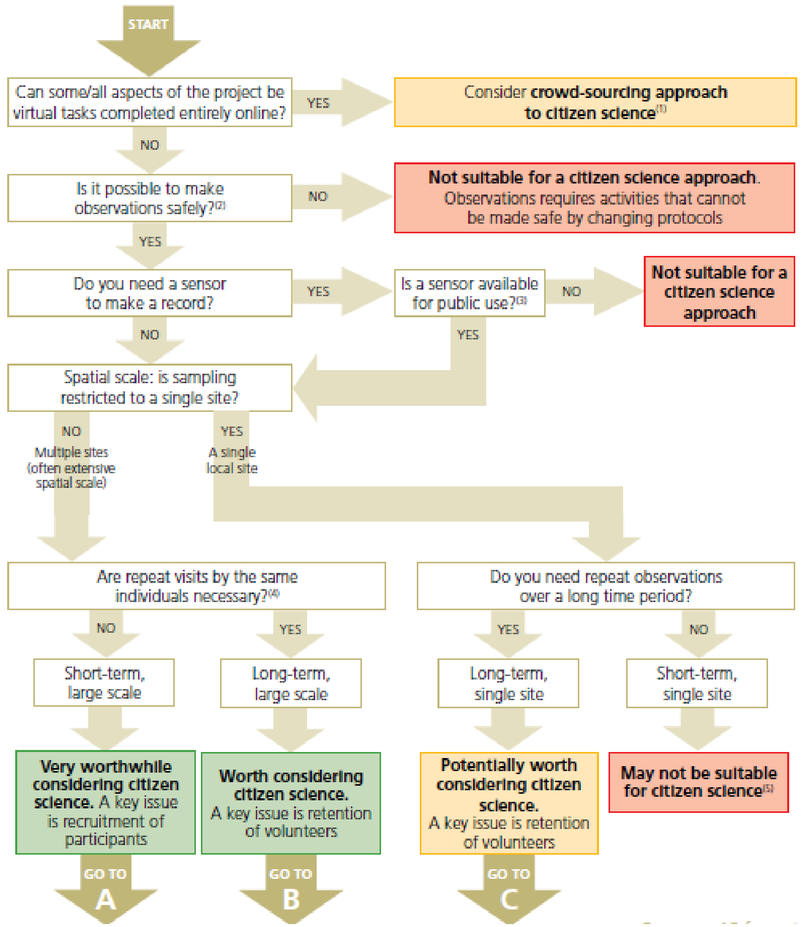




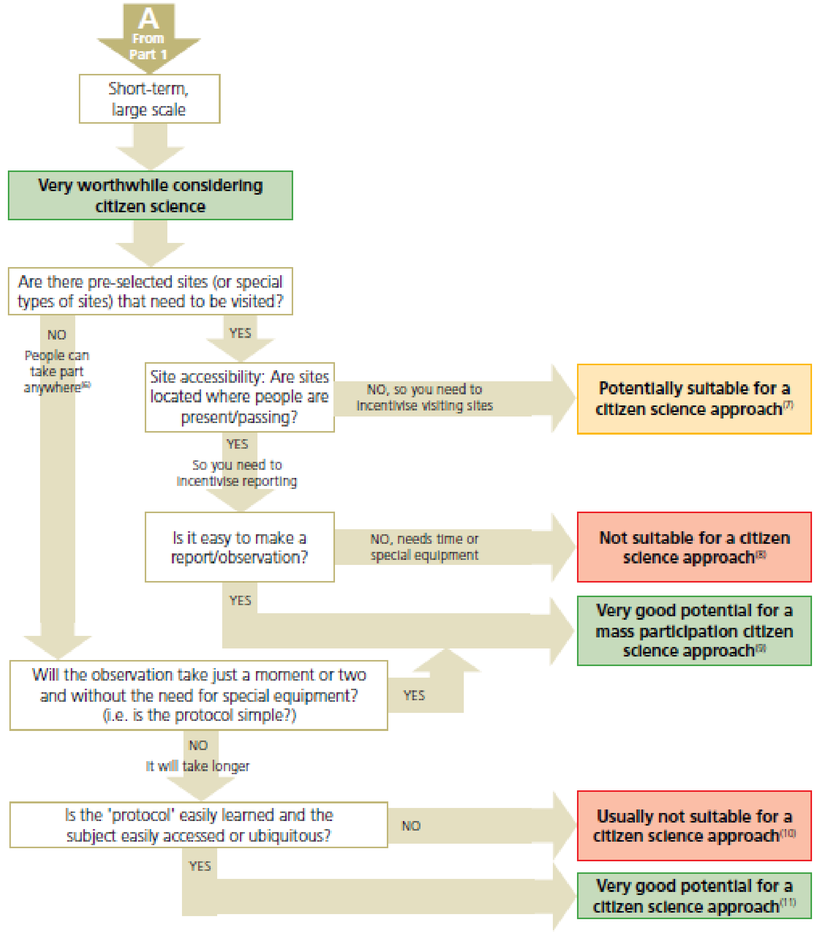
Where to start?



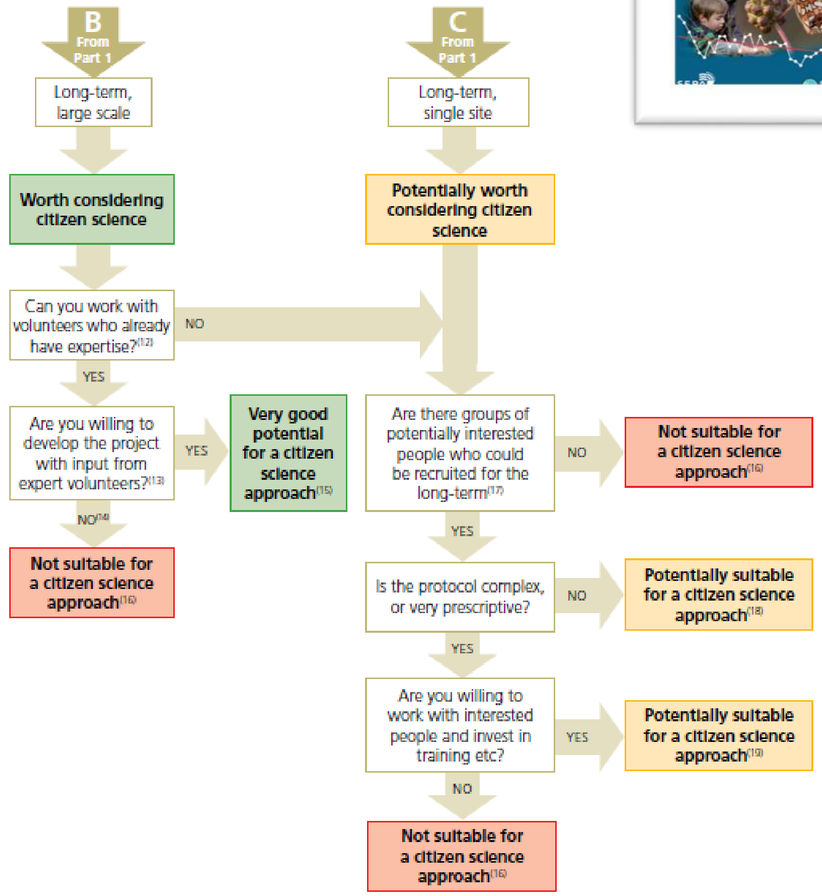
Part 1 of the decision framework



Part 2 of the decision framework *(continued)*



Part 2 of the decision framework *(continued)*



Pocock, M.J.O., Chapman, D.S., Sheppard, L.J. & Roy, H.E. (2014). **Choosing and Using Citizen Science: a guide to when and how to use citizen science to monitor biodiversity and the environment.** Centre for Ecology & Hydrology.

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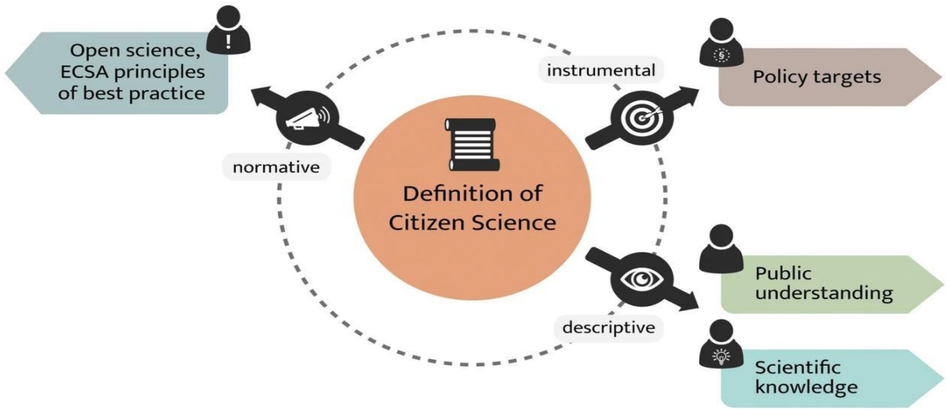
The 10 Citizen Science principles

ecsa European Citizen Science Association



In 2015, the ECSA working group on 'Sharing best practice and building capacity for citizen science' developed a document outlining Ten Principles of Citizen Science.
Drawing from the collective experiences of many ECSA members, this series of statements **set out the key principles which ECSA believes underlies good practice in citizen science, regardless of the academic discipline or cultural context in which it is applied.**

https://ecsa.citizen-science.net/documents

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EUROPEAN CITIZEN SCIENCE ASSOCIATION

Dieci principi di Citizen Science

La Citizen science è un concetto flessibile, che può essere adattato e applicato a diverse situazioni e discipline. Le enunciazioni riportate in questo documento sono state sviluppate dal gruppo di lavoro 'Sharing best practice and building capacity' (Condivisione delle migliori pratiche e rafforzamento delle capacità) della **Associazione Europea di Citizen Science**, guidato dal Museo di Storia Naturale di Londra, con contributi da numerosi membri della Associazione, per stabilire alcuni principi chiave che come comunità crediamo debbano essere alla base di ogni buona pratica nella Citizen science. La traduzione in italiano è a cura di Andrea Sforzi, membro del Board of Directors di ECSA.

1. I progetti di Citizen science coinvolgono attivamente i cittadini in attività scientifiche che generano nuova conoscenza o comprensione. *I cittadini possono agire come contributori, collaboratori, o responsabili di progetto e ricoprono un ruolo significativo nel progetto.*
2. I progetti di Citizen Science producono un risultato scientifico originale. *Ad esempio, fornire una risposta ad un quesito di ricerca o mettere in pratica azioni di conservazione, decisioni gestionali o politiche ambientali.*
3. Sia gli scienziati professionisti sia i cittadini convolti traggono vantaggio dal prendere parte a progetti di Citizen Science. *I vantaggi possono includere la pubblicazione dei risultati di una ricerca, opportunità di apprendimento, piacere personale, benefici sociali, soddisfazione per aver contribuito a fornire una evidenza scientifica per, ad esempio: trovare risposte a questioni di rilevanza locale, nazionale e internazionale e, attraverso queste, avere l'opportunità di influire sulle politiche di settore.*
4. Le persone coinvolte in progetti di Citizen Science possono, se vogliono, prendere parte a più fasi del processo scientifico. *Questo può includere lo sviluppo di quesiti di ricerca, mettere a punto un metodo, raccogliere e analizzare dati e comunicare I risultati.*
5. Le persone coinvolte in progetti di Citizen Science ricevono feedback. *Ad esempio, come i loro dati vengono utilizzati e quali sono i risultati nel campo della ricerca, politico e sociale.*
6. La Citizen Science è considerata una metodologia di ricerca come qualunque altra, con limiti e margini di errore che devono essere considerati e tenuti sotto controllo. *Tuttavia, a differenza delle metodologie tradizionali di ricerca, la Citizen Science fornisce opportunità di un ampio coinvolgimento del pubblico e di democraticizzazione della scienza.*
7. Dati e metadati provenienti da progetti di Citizen Science sono resi pubblicamente disponibili e, ove possibile, i risultati sono pubblicati in un formato di libero accesso (open access). *La condivisione dei dati può avvenire durante o dopo il progetto, a meno che esistano motivi di sicurezza o privacy che lo impediscano.*
8. Il contributo delle persone coinvolte in progetti di Citizen Science viene riconosciuto ufficialmente nei risultati dei progetti e nelle pubblicazioni.
9. I programmi di Citizen Science vengono valutati per il loro risultato scientifico, per la qualità dei dati, l'esperienza dei partecipanti e l'ampiezza dell'impatto sociale e sulle politiche di settore.
10. I responsabili di progetti di Citizen Science prendono in considerazione aspetti legali ed etici relativi a copyright, proprietà intellettuale, accordi sulla condivisione dei dati, confidenzialità, attribuzione e impatto ambientale di ogni attività.

November 2015, Grosseto

10 principles of citizen science

1. Citizen science projects actively involve citizens in scientific endeavour that generates new knowledge or understanding. Citizens may act as contributors, collaborators, or as project leader and have a meaningful role in the project.
2. **Citizen science projects have a genuine science outcome. For example, answering a research question or informing conservation action, management decisions or environmental policy.**
3. Both the professional scientists and the citizen scientists benefit from taking part. Benefits may include the publication of research outputs, learning opportunities, personal enjoyment, social benefits, satisfaction through contributing to scientific evidence e.g. to address local, national and international issues, and through that, the potential to influence policy.
4. **Citizen scientists may, if they wish, participate in multiple stages of the scientific process. This may include developing the research question, designing the method, gathering and analysing data, and communicating the results.**
5. Citizen scientists receive feedback from the project. For example, how their data are being used and what the research, policy or societal outcomes are.

Funded by the European Union

10 principles of citizen science

6. Citizen science is considered a research approach like any other, with limitations and biases that should be considered and controlled for. However unlike traditional research approaches, citizen science provides opportunity for greater public engagement and democratisation of science.
7. **Citizen science project data and meta-data are made publicly available and where possible, results are published in an open access format. Data sharing may occur during or after the project, unless there are security or privacy concerns that prevent this.**
8. Citizen scientists are acknowledged in project results and publications.
9. Citizen science programmes are evaluated for their scientific output, data quality, participant experience and wider societal or policy impact.
10. The leaders of citizen science projects take into consideration legal and ethical issues surrounding copyright, intellectual property, data sharing agreements, confidentiality, attribution, and the environmental impact of any activities.

Funded by the European Union

OpenRRI promotes transparency, inclusivity, and sustainability in research and innovation

- **Transparency and accessibility:** OpenRRI research practices ensure that data, methods, and findings are open and accessible to all, fostering trust and reproducibility in scientific endeavours.
- **Inclusive collaboration:** OpenRRI emphasizes inclusivity by actively engaging diverse stakeholders, striving to ensure that scientific advancements contribute equitably to the benefit of all segments of society.
- **Sustainable solutions:** OpenRRI seek to integrate societal and environmental needs and values to develop sustainable solutions that effectively address global challenges.

Funded by the European Union
Circle U. European University Alliance

Citizen Science: A Catalyst for Advancing OpenRRI through Transparency, Inclusivity, and Community-Driven Solutions

- **Enhanced transparency:** Open sharing of data, methods, and results in citizen science promote transparency and accountability in research processes.
- **Inclusive collaboration:** Citizen science engages everyone to participate in scientific research, fostering inclusivity and democratising knowledge creation.
- **Sustainable solutions:** Contributions from diverse citizen scientists drive responsible innovation by integrating community insights to address real-world challenges with a focus on sustainability.

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Codes of conduct and ethical principles for citizen science

Four (of ten) principles of citizen science

3. Both scientists and the citizen scientists benefit from taking part

- For example: learning opportunities; satisfaction through contributing to addressing local, national and international issues; potential to influence policy; advancing science.

5. Citizen scientists receive feedback from the project

- For example, how project data are used and what the outcomes are (research, policy, or societal).

7. Citizen science data and meta-data are made publicly available and where possible, results are published in an open access format

- Data sharing may occur during or after the project, unless there are security or privacy concerns that prevent this.

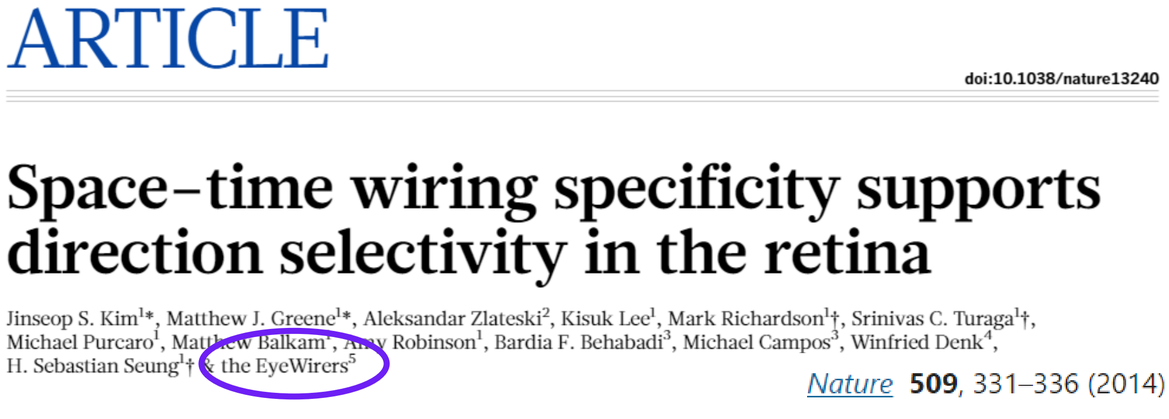
8. Citizen scientists are acknowledged in project results and publications

- For example, as authors or in acknowledgements.

ecsa European Citizen Science Association

Ten principles of citizen science

www.ecsa.ngo/10-principles



ARTICLE

doi:10.1038/nature13240

Space–time wiring specificity supports direction selectivity in the retina

Jinseop S. Kim[1]*, Matthew J. Greene[1]*, Aleksandar Zlateski[2], Kisuk Lee[1], Mark Richardson[1]†, Srinivas C. Turaga[1]†, Michael Purcaro[1], Matthew Balkam[1], Amy Robinson[1], Bardia F. Behabadi[3], Michael Campos[3], Winfried Denk[4], H. Sebastian Seung[1]† & the EyeWirers[5]

Nature 509, 331–336 (2014)

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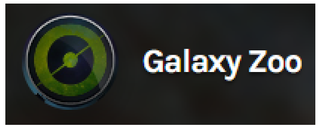
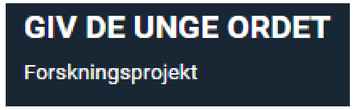
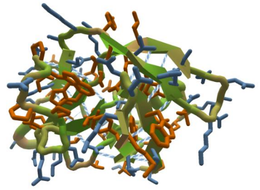
The vast application of Citizen science



CLOUDSPOTTING ON MARS

EXOASTEROIDS





CCCBLAB
CULTURAL RESEARCH AND INNOVATION

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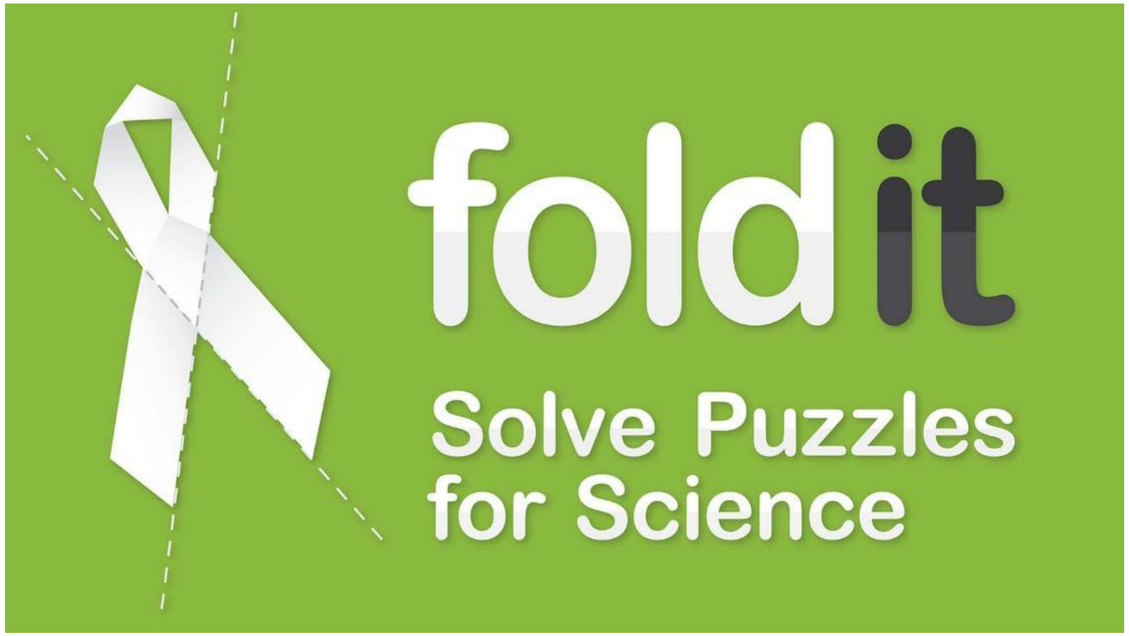
Citizen Science Case Study 1

- Make computer power available for projects
- Solve simple tasks online
- Play games with research content online
- Crowdfunding for science



Play Foldit, the game that helped its designers win a Nobel Prize

The protein puzzle game is still being actively developed.

By Mark Hachman
Senior Editor, PCWorld | OCT 9, 2024 10:51 AM PDT

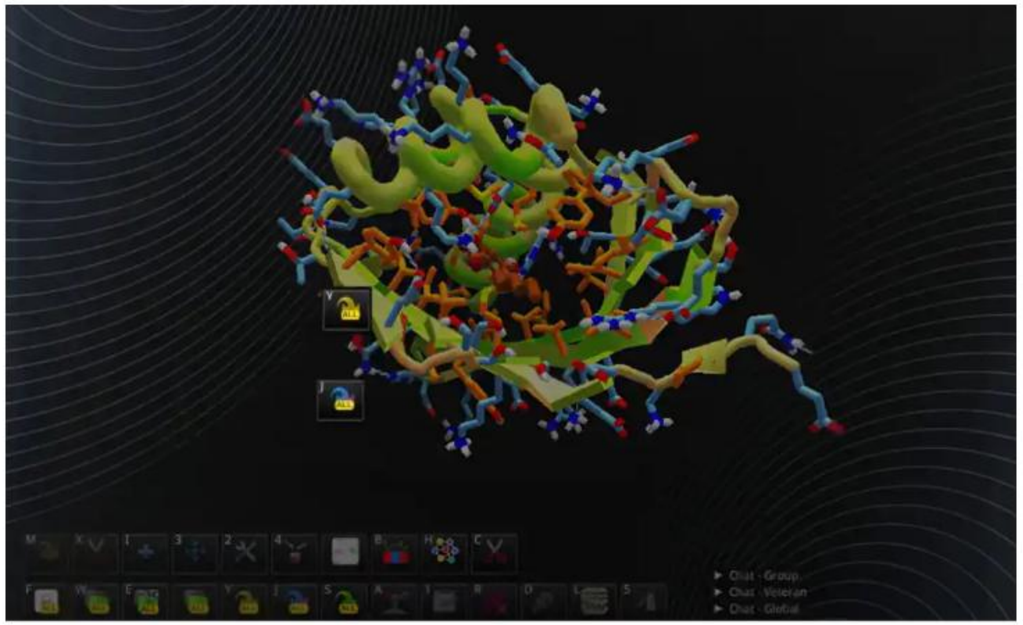


Image: YouTube / Fold.it

You may know that biochemist David Baker shares the 2024 Nobel Prize in chemistry with two researchers from Google's DeepMind. But a video game helped get them there, and you can still play — and contribute to science — even today.

Citizen Science Case Study 2

- Participate in research prioritization
- Monitoring biodiversity
- Digitizing archival material
- Community science
- Data collection for environmental monitoring
- Participatory experiments
- Health and medical research
- Urban science and planning
- Educational citizen science
- Technology and software testing
- ...

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Citizen Science Case Study 3

← Hjælp forskerne

Find Foråret

STATENS NATURHISTORISKE MUSEUM

HVID ANEMONE

De flotte hvide anemoneblomster lyser op i landskabet, og minder os om, at det snart bliver forår.

MIRABELBLOMSTER

Mirabel findes over hele landet, og de hvide blomster er en sikker forårsbebuder. Hvornår ser du årets første?

CITRONSOMMERFUGL

Den gule citronsommerfugl sidder ofte med vingerne lukkede, så den mørke plet på vingen er synlig. Hold godt øje med den i haver, skove og åbne naturområder.

BØGEN SPRINGER UD

Det kan være svært at vide præcis hvornår bøgen springer ud. Men en ting er sikkert: Det sker først dér, hvor der er mest sol. Måske du finder årets første bøgeblad.

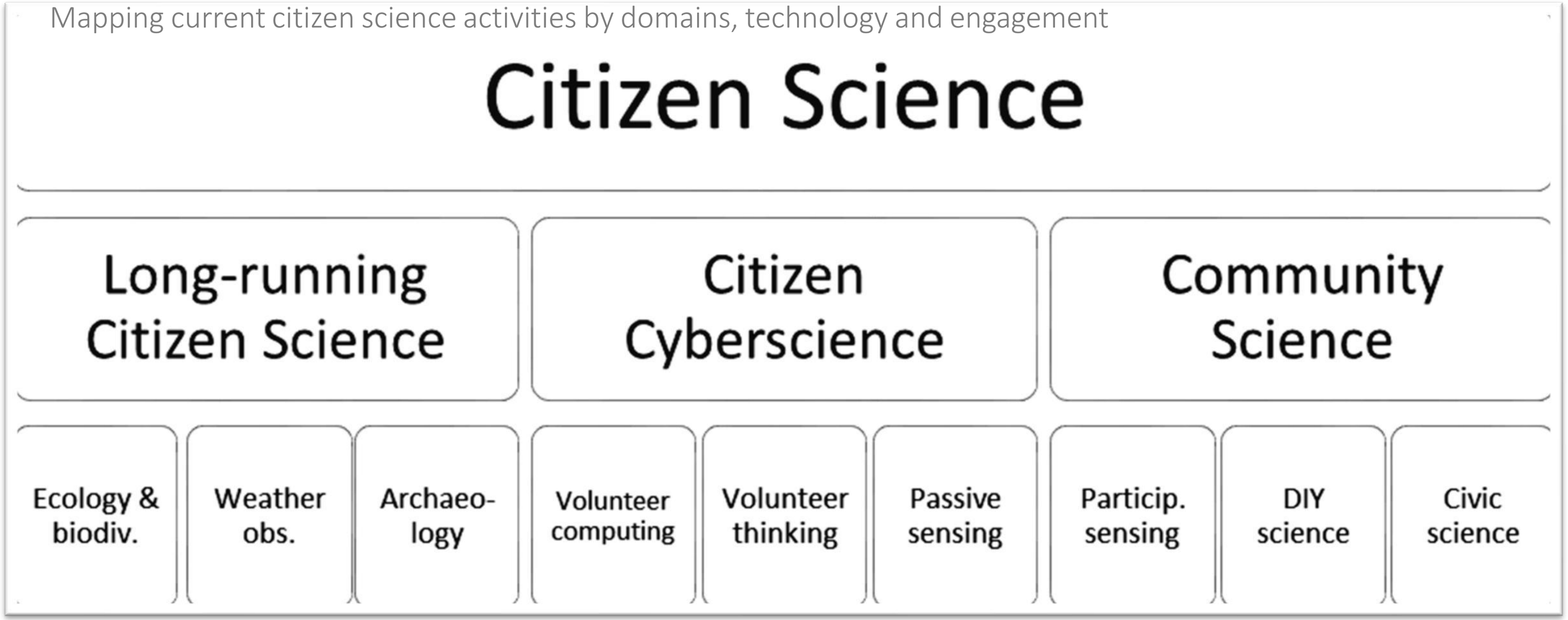
RAMSLØG I BLOMST

Ramsløg kaldes vild hvidløg og er en af forårets helt store delikatesser. Gå efter din næse og følg den karakteristiske duft af løg i skoven.

Funded by the European Union

CS landscape

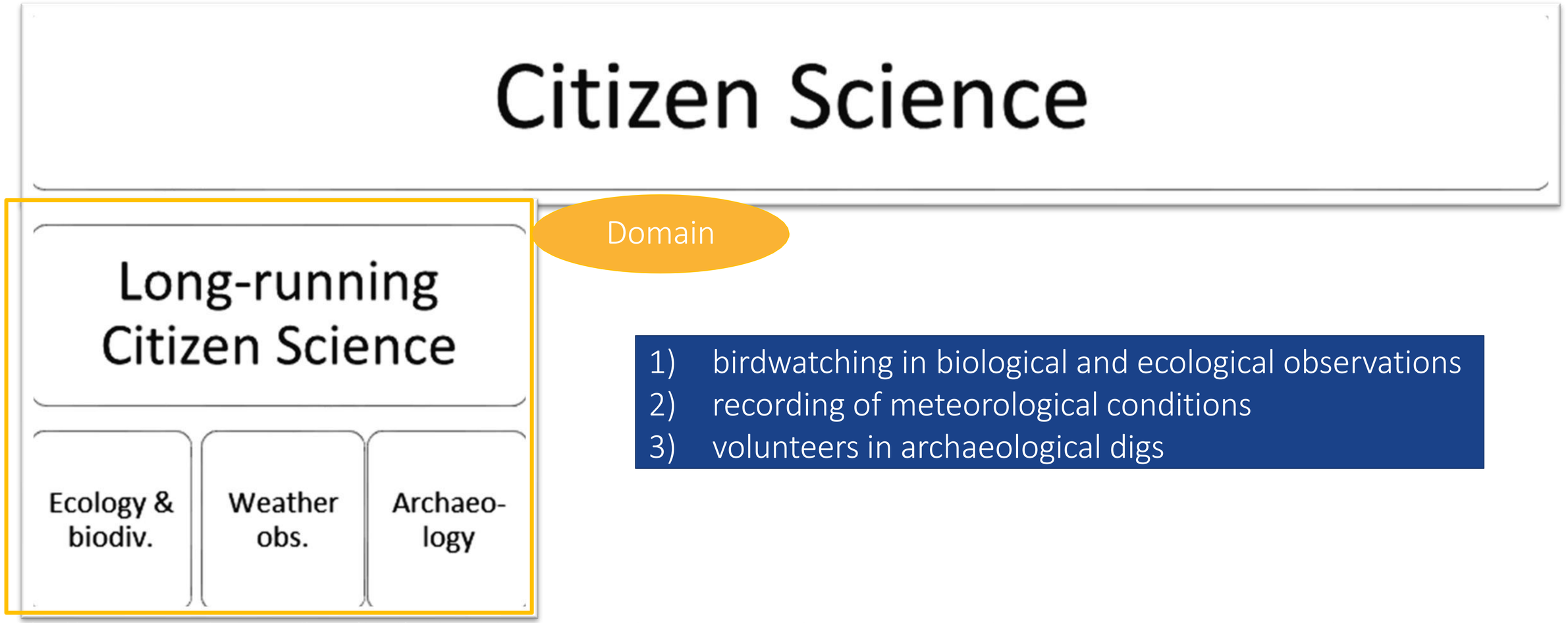
Mapping current citizen science activities by domains, technology and engagement



(Muki) Haklay M., Mazumdar S., Wardlaw J. (2018) Citizen Science for Observing and Understanding the Earth. In: Mathieu PP., Aubrecht C. (eds) Earth Observation Open Science and Innovation. ISSI Scientific Report Series, vol 15. Springer, Cham. https://doi.org/10.1007/978-3-319-65633-5_4

CS landscape

Mapping current citizen science activities by domains, technology and engagement



1) birdwatching in biological and ecological observations
2) recording of meteorological conditions
3) volunteers in archaeological digs

(Muki) Haklay M., Mazumdar S., Wardlaw J. (2018) Citizen Science for Observing and Understanding the Earth. In: Mathieu PP., Aubrecht C. (eds) Earth Observation Open Science and Innovation. ISSI Scientific Report Series, vol 15. Springer, Cham. https://doi.org/10.1007/978-3-319-65633-5_4

Big Garden Birdwatch

Home > Get Involved > Activities > Big Garden Birdwatch

Be wowed by your local wildlife. Simply count the birds you see in your garden, from your balcony or in your local park for one hour between 28 and 30 January 2022.

Big Garden Birdwatch is for everyone. Whether you're a complete beginner or a birding expert, you'll get all the help you need, from bird ID to caring for garden birds. Plus, if you're a teacher, why not inspire your pupils with Big Schools' Birdwatch?

https://www.rspb.org.uk/get-involved/activities/birdwatch/

APRE

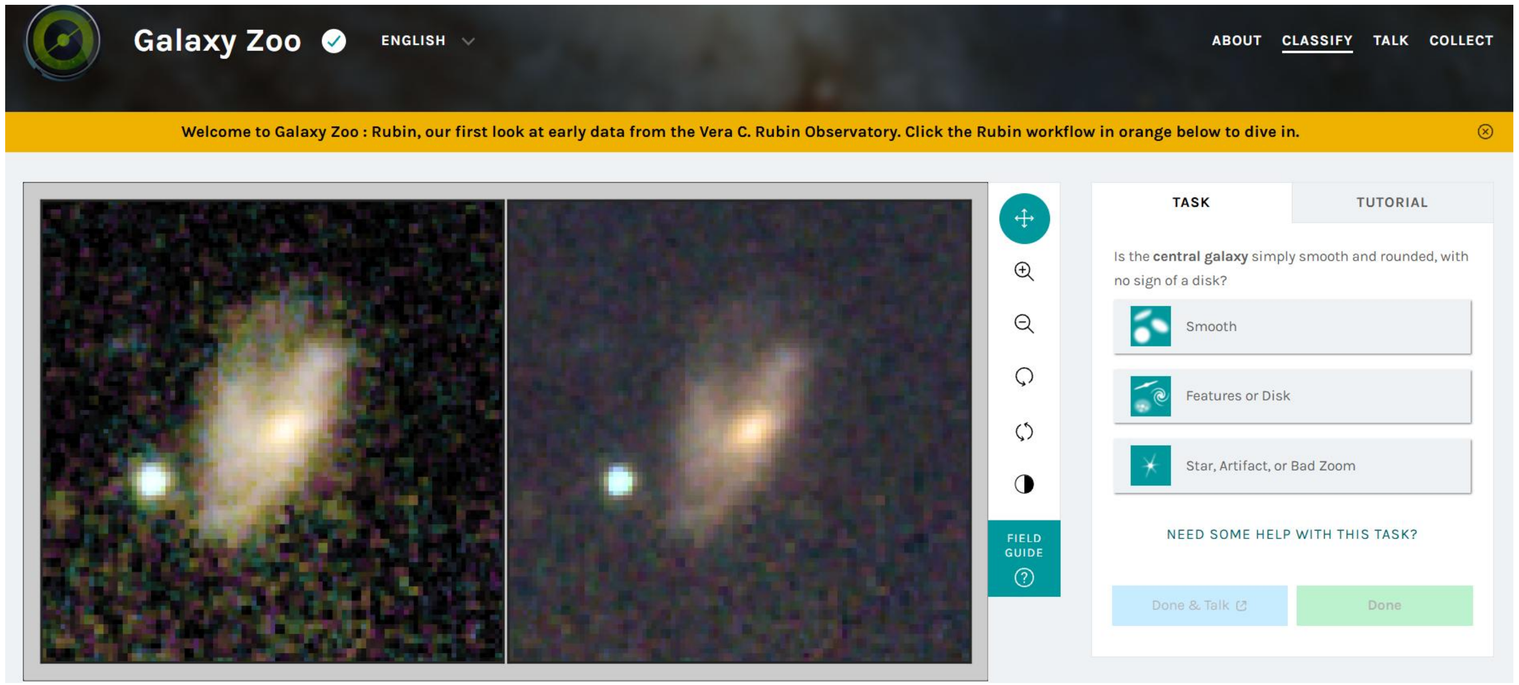
CS landscape

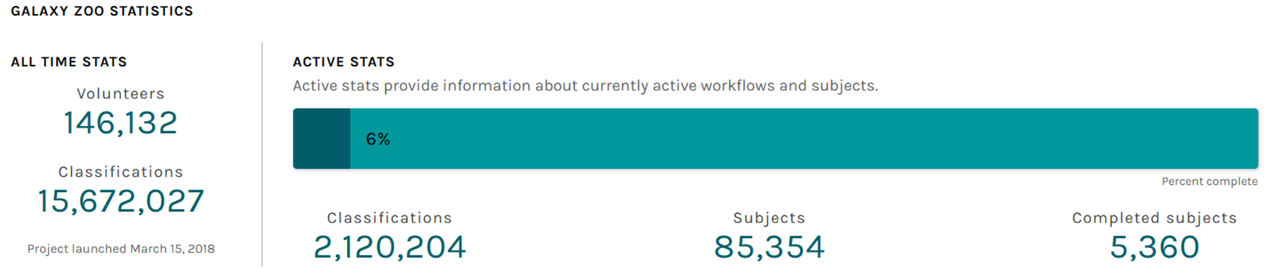
Mapping current citizen science activities by domains, technology and engagement

1) exploits the unused processing capacity in personal computers and uses the Internet
2) engages volunteers at a more active and cognitive level. Participants are asked to classify some information on a website
3) participants either connect sensors to their computers or smartphones

(Muki) Haklay M., Mazumdar S., Wardlaw J. (2018) Citizen Science for Observing and Understanding the Earth. In: Mathieu PP., Aubrecht C. (eds) Earth Observation Open Science and Innovation. ISSI Scientific Report Series, vol 15. Springer, Cham. https://doi.org/10.1007/978-3-319-65633-5_4

Volunteer Thinking project: Galaxy Zoo

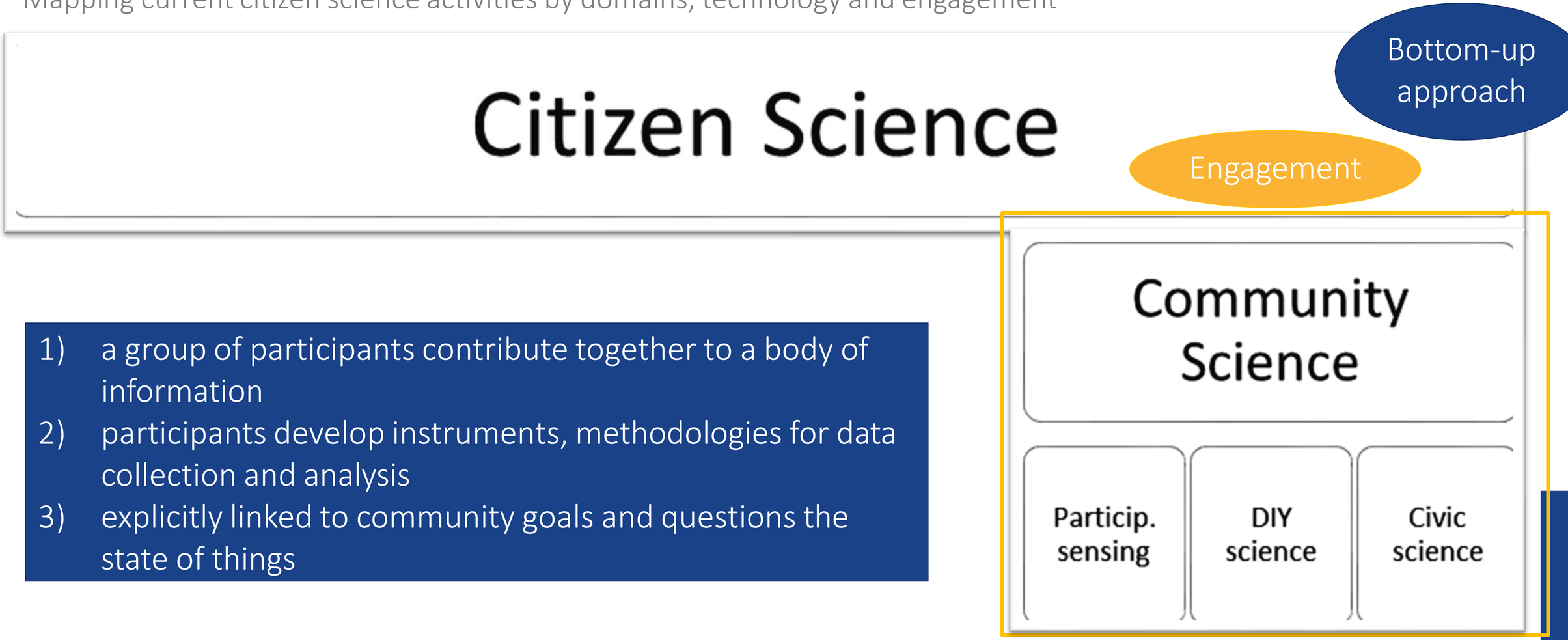




https://www.zooniverse.org/projects/zookeeper/galaxy-zoo/

CS landscape

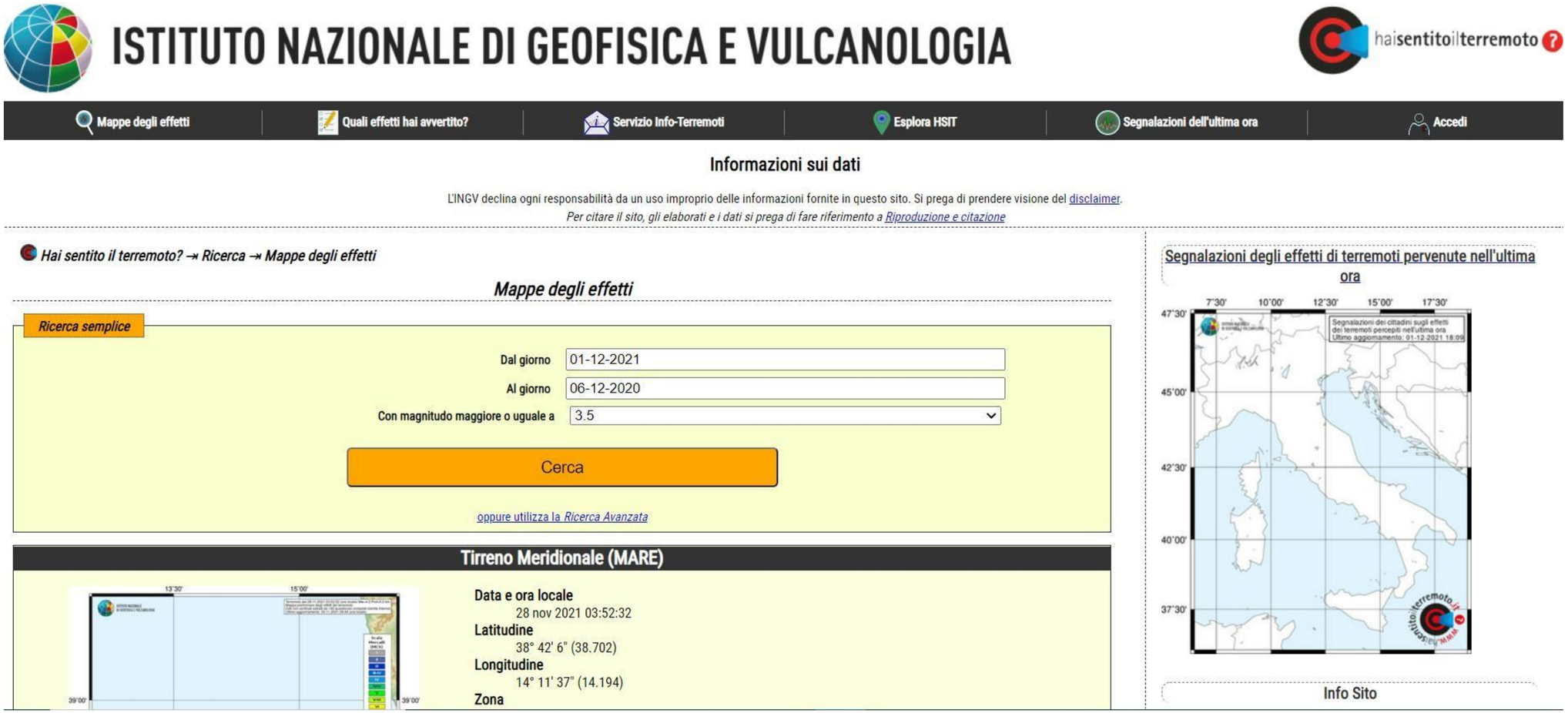
Mapping current citizen science activities by domains, technology and engagement



1) a group of participants contribute together to a body of information
2) participants develop instruments, methodologies for data collection and analysis
3) explicitly linked to community goals and questions the state of things

(Muki) Haklay M., Mazumdar S., Wardlaw J. (2018) Citizen Science for Observing and Understanding the Earth. In: Mathieu PP., Aubrecht C. (eds) Earth Observation Open Science and Innovation. ISSI Scientific Report Series, vol 15. Springer, Cham. https://doi.org/10.1007/978-3-319-65633-5_4

Participatory sensing: Hai sentito il terremoto?



https://www.hsit.it/

APRE

Citizen science methodologies by levels of participation

Level of involvement in the project for citizens vs. scientists

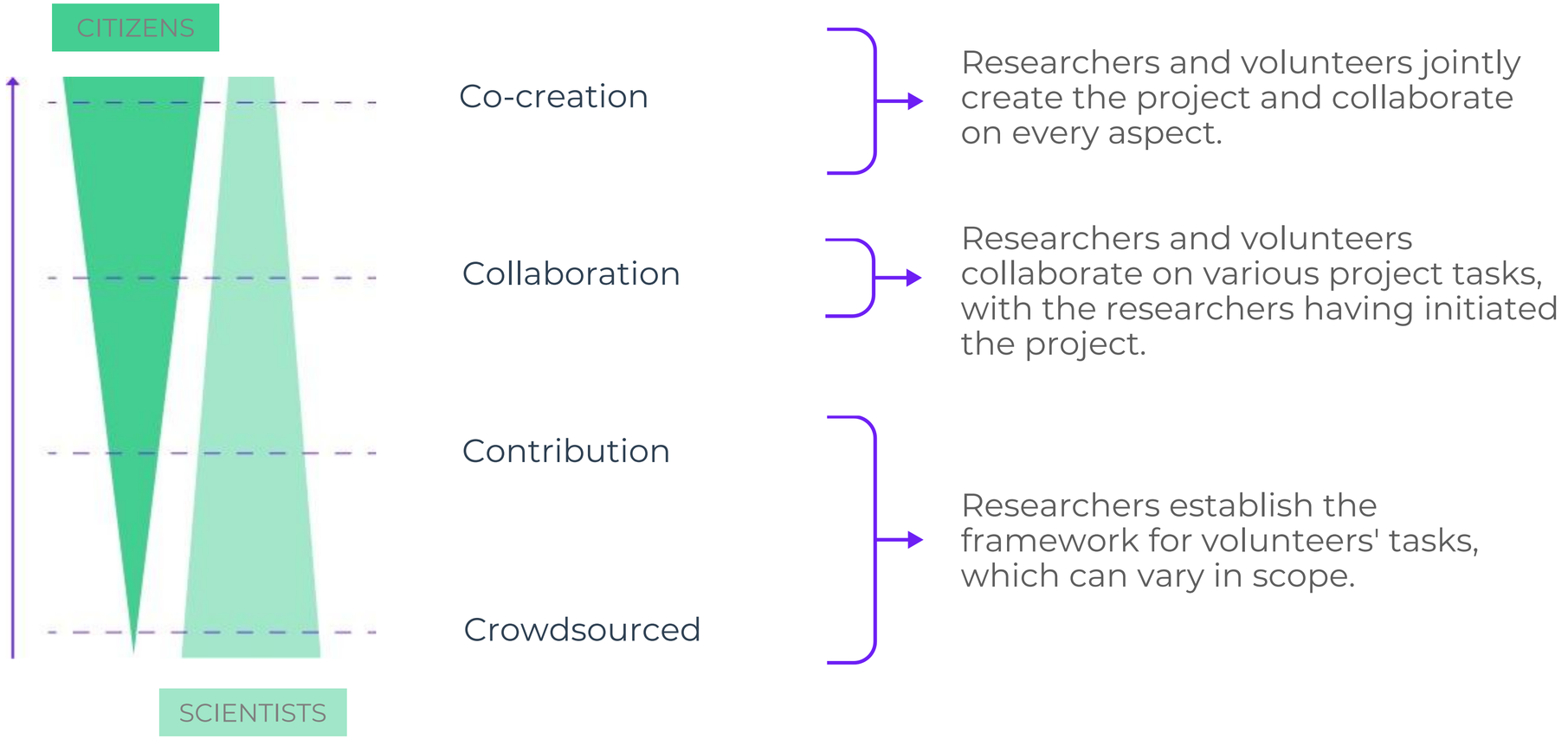


Figure 1: Diagram showing how typology determines the level of engagement for both citizens and scientists.

Adapted from Collins *et al.* 2022 *JCOM* 21(07)A01, p.3 https://doi.org/10.22323/2.21070201

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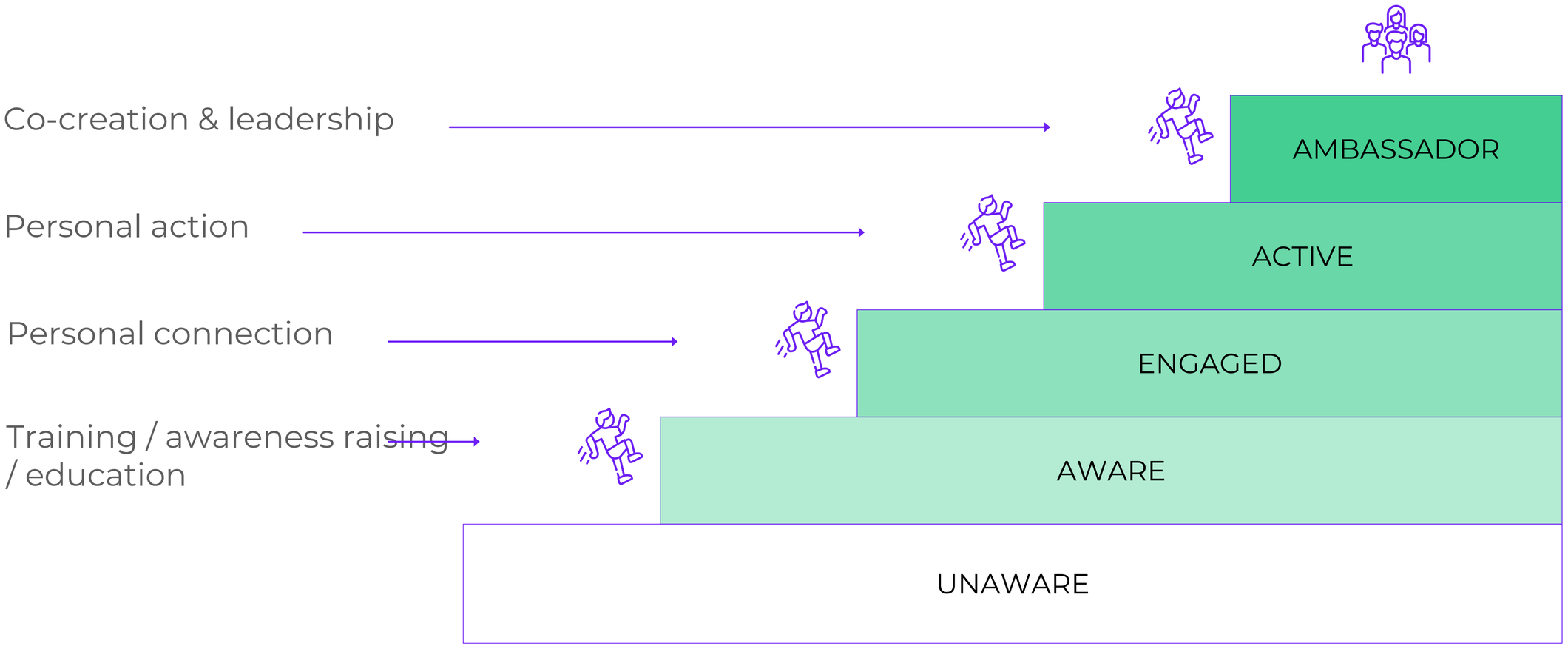
Ladder of participation

(for both participants and researchers)



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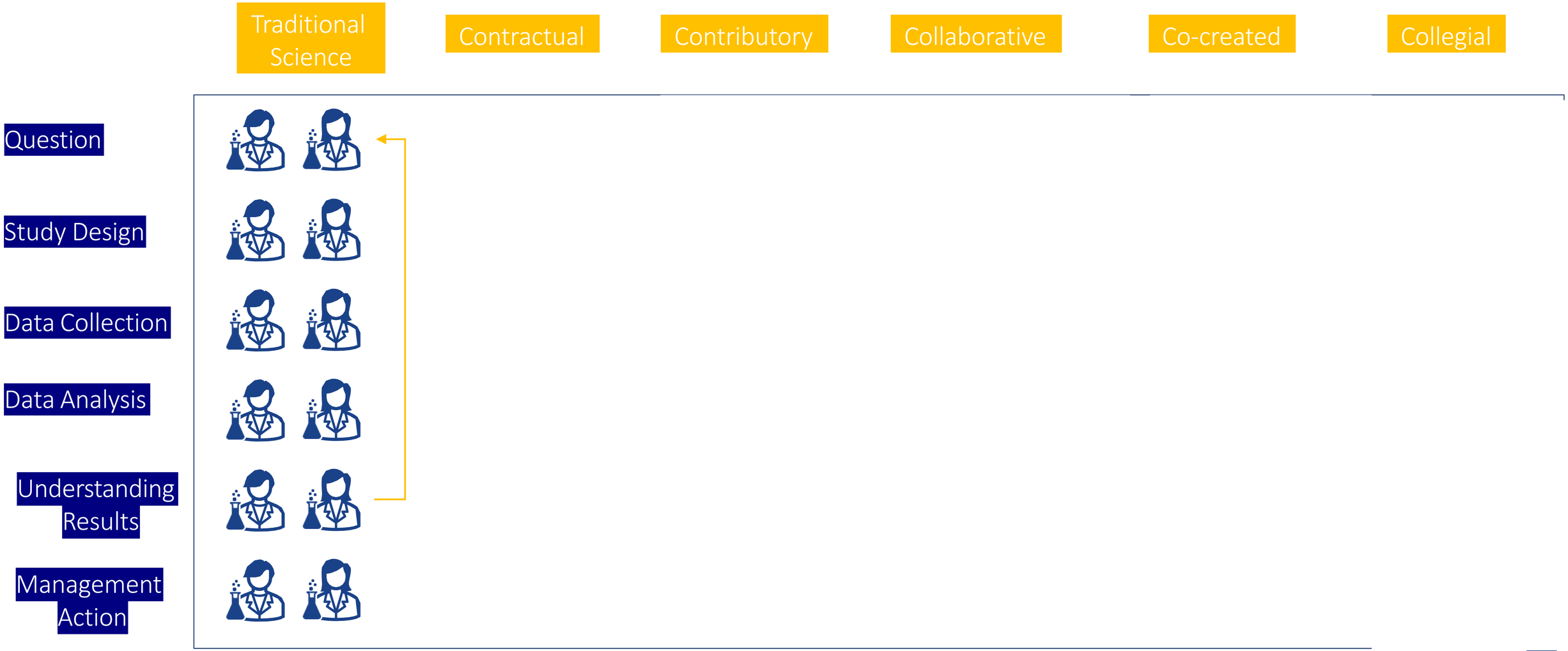
Citizen Science typologies: The 5Cs Types



Adapted from Cooper, C. B., J. Dickinson, T. Phillips, and R. Bonney. 2007. Citizen science as a tool for conservation in residential ecosystems. Ecology and Society 12(2): 11. [online] URL: http://www.ecologyandsociety.org/vol12/iss2/art11/

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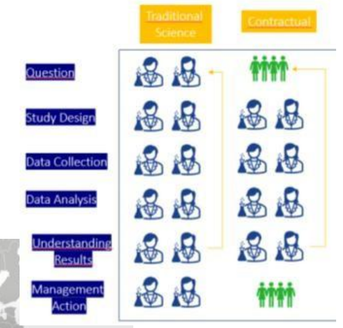
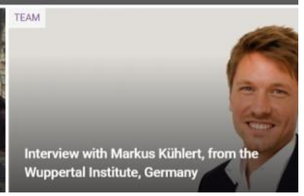
Example of Contractual CS projects

European Science Shops the public participates by raising a question of concern, often a question that researchers would otherwise not consider.



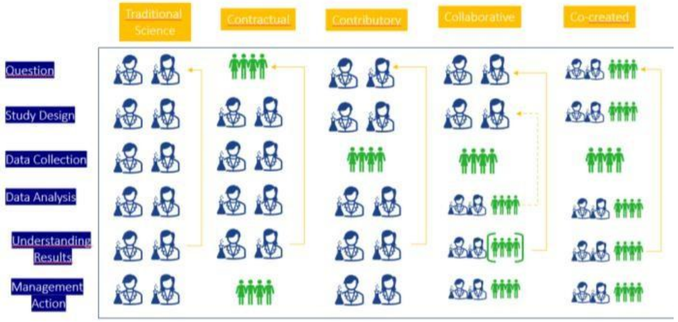


*This model **allows an expansion of traditional science research** from being driven solely by the interests of researchers (or the needs of the field) to consider community-relevant questions and interests. As opportunities for public participation are limited throughout the remainder of the research process in this model, however, it can arguably reinforce the traditionally distinct roles of scientists as producers of knowledge and the public as consumers, albeit in this case consumers with enhanced control over the research agenda and the resulting knowledge produced.*

Ecology and Society 17(2): 29 http://www.ecologyandsociety.org/vol17/iss2/art29

APRE

Examples of Co-created CS projects



- "Making Sense" a citizen sensing project looking to address issues of noise and air pollution in Amsterdam (Holland), Barcelona (Spain) and Prishtina (Kosovo)

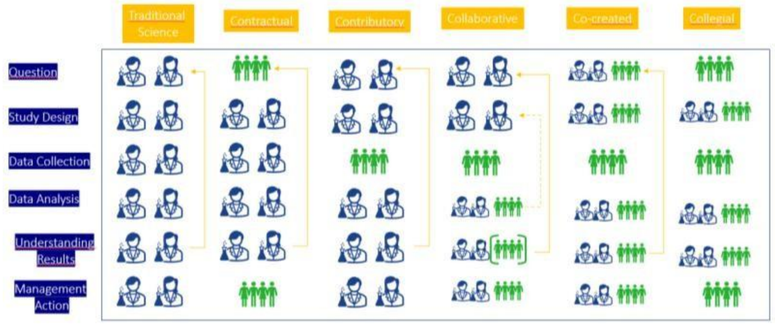
"We aim to explore how open-source software, open-source hardware, digital maker practices and open design can be effectively used by local communities to fabricate their own sensing tools, make sense of their environments and address pressing environmental problems in air, water, soil and sound pollution"

- "Caring for Waterhole Creek" a water quality assessment carried out in Victoria, Australia, in partnership with local residents [EPA Victoria, 2018].

The fact that co-created projects often emerge from community needs means that they have an increased interest in delivering direct benefits for citizen communities, such as resource management, actionable knowledge and community empowerment.
Co-created approaches can contribute to interventions and change, on a local, policy and community level.
https://jcom.sissa.it/article/pubid/JCOM_2005_2021_Y01/

APRE

Examples of Co-created CS projects



NOISE MAPS

Noise Maps allowed citizens to generate and analyse urban sound data, empowering communities to take action to reduce unwanted noise and protect the local sonic heritage.

The pilot built on existing cultural practices of collective documentation of the sound heritage of neighbourhoods (Mapa Sonor).

LOCATION
Barcelona (Spain)

TYPE/S OF POLLUTION
Noise pollution

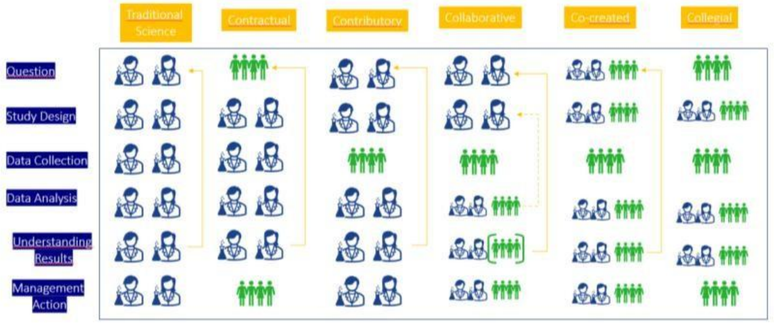
SUSTAINABLE DEVELOPMENT GOALS ADDRESSED?

NUMBER OF CITIZENS SCIENTISTS INVOLVED
12

The pilot was concluded in October 2020.

APRE

Example of Extreme CS project



The ECSAnVis project builds on existing knowledge of how non-literate people and those with little or no understanding of technology can successfully take part in producing research questions and collecting the required data.

Extreme CS: a more bottom-up and inclusive approach, sensitive to local context.

The team set up 20 case studies around the world.
=> In the hugely biodiverse Brazilian Pantanal wetlands, a conflict regarding inland fisheries in the Pantanal wetland: policymakers despite having no research-based evidence, accuse local people of overfishing and driving the drastic reduction in tourist numbers coming to the region for recreational fishing.
=> Local communities used Sapelli to collect data about their fishing practices and local environment. This demonstrated that their traditional practices were sustainable and so should be protected by local conservation policies.

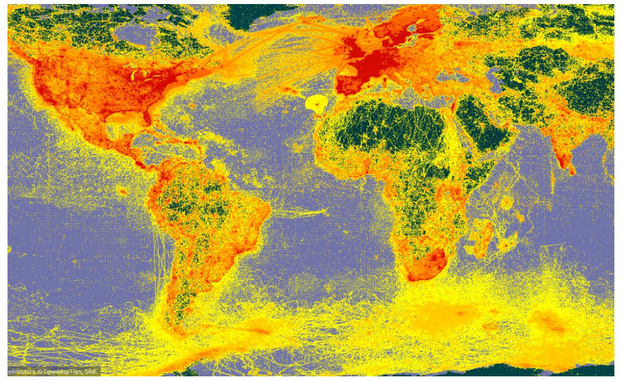
https://cordis.europa.eu/article/id/442682-extreme-citizen-science-engages-remote-communities
https://discovery.ucl.ac.uk/id/eprint/10120404/1/Geographic-Citizen-Science-Design.pdf

APRE

Finding Participants' Motivations

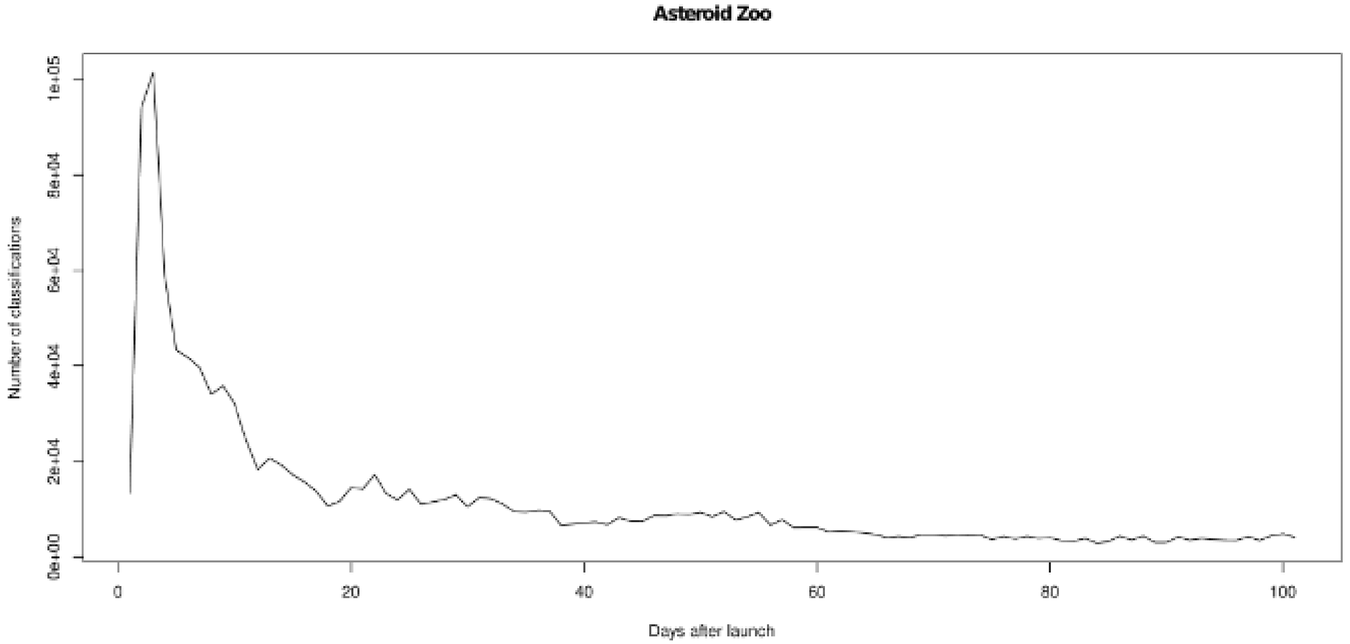
(environmental citizen scientists, but overall motivations are valid for all project types)

Motivational function	Specific motivation	Sources
Values	Interest in wildlife Concern for the environment, wildlife or conservation	Weston et al. 2006, Davies et al. 2011, Hobbs and White 2012, Johnson et al. 2014, Wright et al. 2015, Geoghegan et al. 2016, Martin et al. 2016
	Contribution to science and data collection	Davies et al. 2011, Hobbs and White 2012, Wright et al. 2015, Geoghegan et al. 2016, Martin et al. 2016
Understanding	Desire to learn and exchange knowledge	Bell et al. 2008, Thiel et al. 2014, Martin et al. 2016
Recreation / Enhancement	Opportunity to spend time in nature or outdoors	Bell et al. 2008, Johnson et al. 2014, Wright et al. 2015
	Gaining public recognition for their efforts	Thiel et al. 2014
Social	Social interactions	Bell et al. 2008
	Collectivism	Rotman et al. 2012



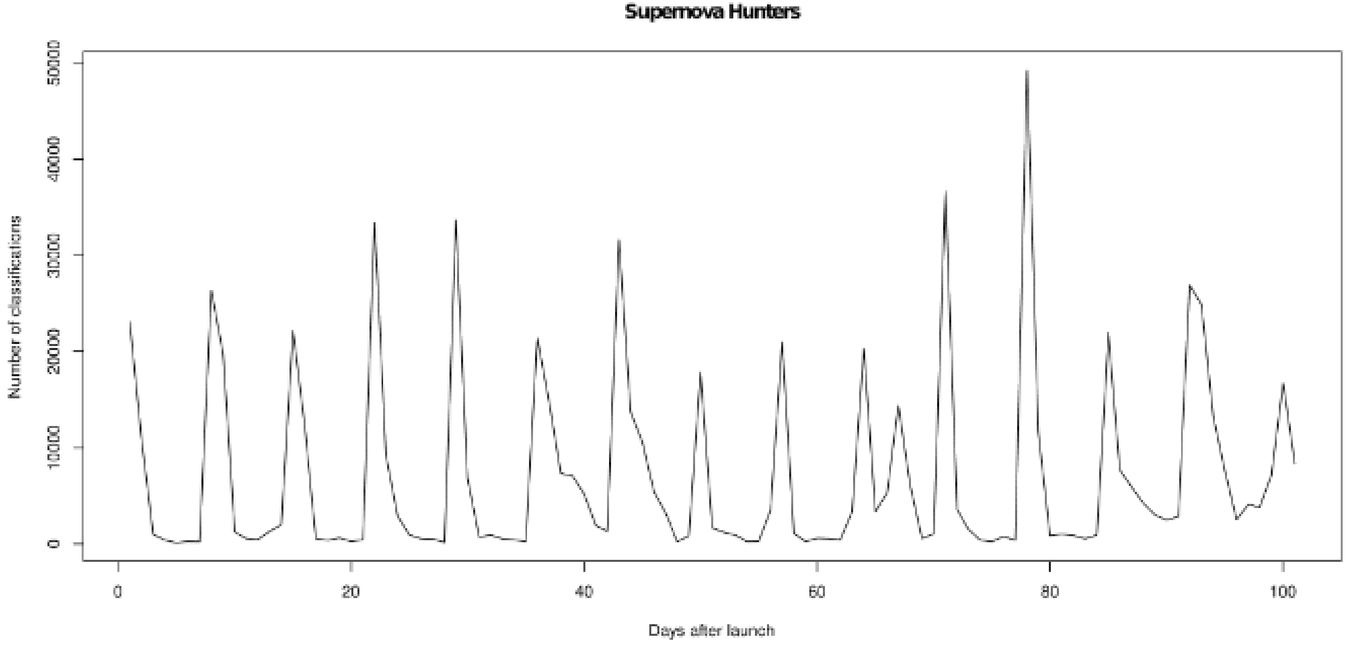
www.gbif.org

a) Number of classifications a day on Asteroid Zoo.



https://www.zooniverse.org

b) Number of classifications a day on Supernova Hunters.



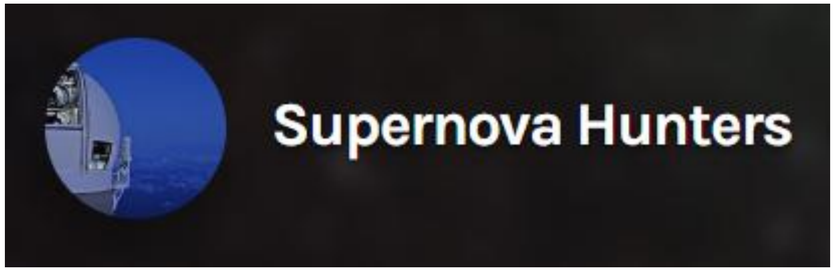
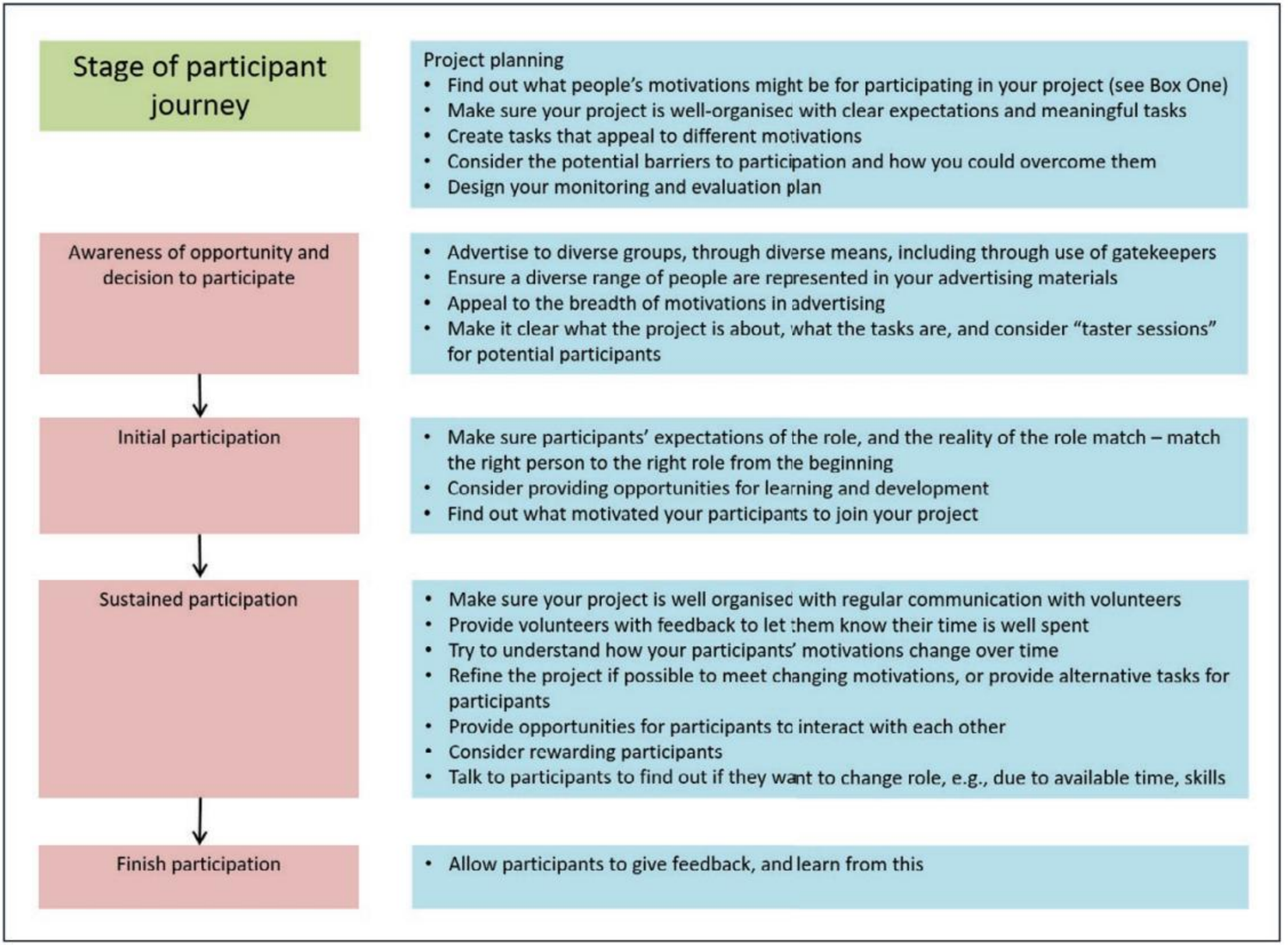


Figure 4 : *Supernova Hunters has a distinctive classification curve.* A typical Zooniverse project has a classification curve displaying a peak of activity after launch that rapidly declines a), however there are exceptions to this observation, the most striking of which is the classification curve of the *Supernova Hunters*

Spiers, H., Swanson, A., Fortson, L., Simmons, B., Trouille, L., Blickhan, S. and Lintott, C. (2019). Everyone counts? Design considerations in online citizen science *JCOM* 18(01), A04. https://doi.org/10.22323/2.18010204

The Participants *The Citizen Science Project (you?)*



Stage of participant journey	
	Project planning • Find out what people's motivations might be for participating in your project (see Box One) • Make sure your project is well-organised with clear expectations and meaningful tasks • Create tasks that appeal to different motivations • Consider the potential barriers to participation and how you could overcome them • Design your monitoring and evaluation plan
Awareness of opportunity and decision to participate	• Advertise to diverse groups, through diverse means, including through use of gatekeepers • Ensure a diverse range of people are represented in your advertising materials • Appeal to the breadth of motivations in advertising • Make it clear what the project is about, what the tasks are, and consider "taster sessions" for potential participants
Initial participation	• Make sure participants' expectations of the role, and the reality of the role match – match the right person to the right role from the beginning • Consider providing opportunities for learning and development • Find out what motivated your participants to join your project
Sustained participation	• Make sure your project is well organised with regular communication with volunteers • Provide volunteers with feedback to let them know their time is well spent • Try to understand how your participants' motivations change over time • Refine the project if possible to meet changing motivations, or provide alternative tasks for participants • Provide opportunities for participants to interact with each other • Consider rewarding participants • Talk to participants to find out if they want to change role, e.g., due to available time, skills
Finish participation	• Allow participants to give feedback, and learn from this

Figure 1: The journey that a participant takes when participating in a project (left side), with a checklist for project organisers corresponding to each of these stages (right side) to maximise the changes of people having a positiv experience of participating.

Plan
Motivation
Meaningful tasks
Potential barriers

"Advertise"
Match motivations
Clear tasks

Recruit
Match tasks & participants
Opportunities (e.g. learning)

Retain
Changing motivations?
Clear communication

End of participation
Feedback & learning – 2-way!

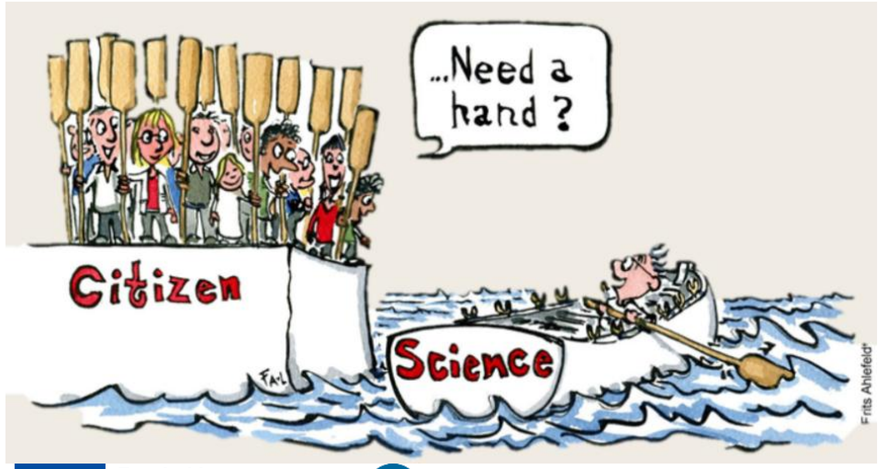
CITIZEN SCIENCE: THEORY AND PRACTICE

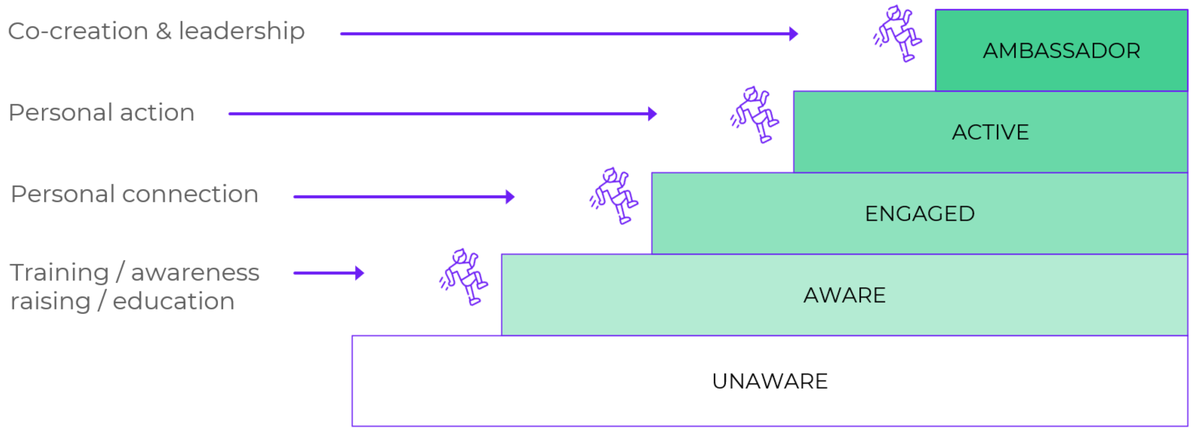
West, S and Pateman, R 2016 Recruiting and Retaining Participants in Citizen Science: What Can Be Learned from the Volunteering Literature? *Citizen Science: Theory and Practice*, 1(2): 15, pp.1–10, DOI: https://doi.org/10.5334/cstp.8

Barriers / Mitigating measures

- Unaware of project
- Lack of time
- Perceived lack of skills
- Importance of project?
- No personal ask
- Physical or mental health barrier

- Communicate, maybe gatekeepers
- Be clear about time needed
- Be clear about skills needed, and opportunities for training
- Show participants they are important for project outcomes. Clear project goals
- Reach out, communicate. Get participants to ask their networks – ‘snowball’ effect
- Consider if, how, and when to include participants with physical or mental health issues





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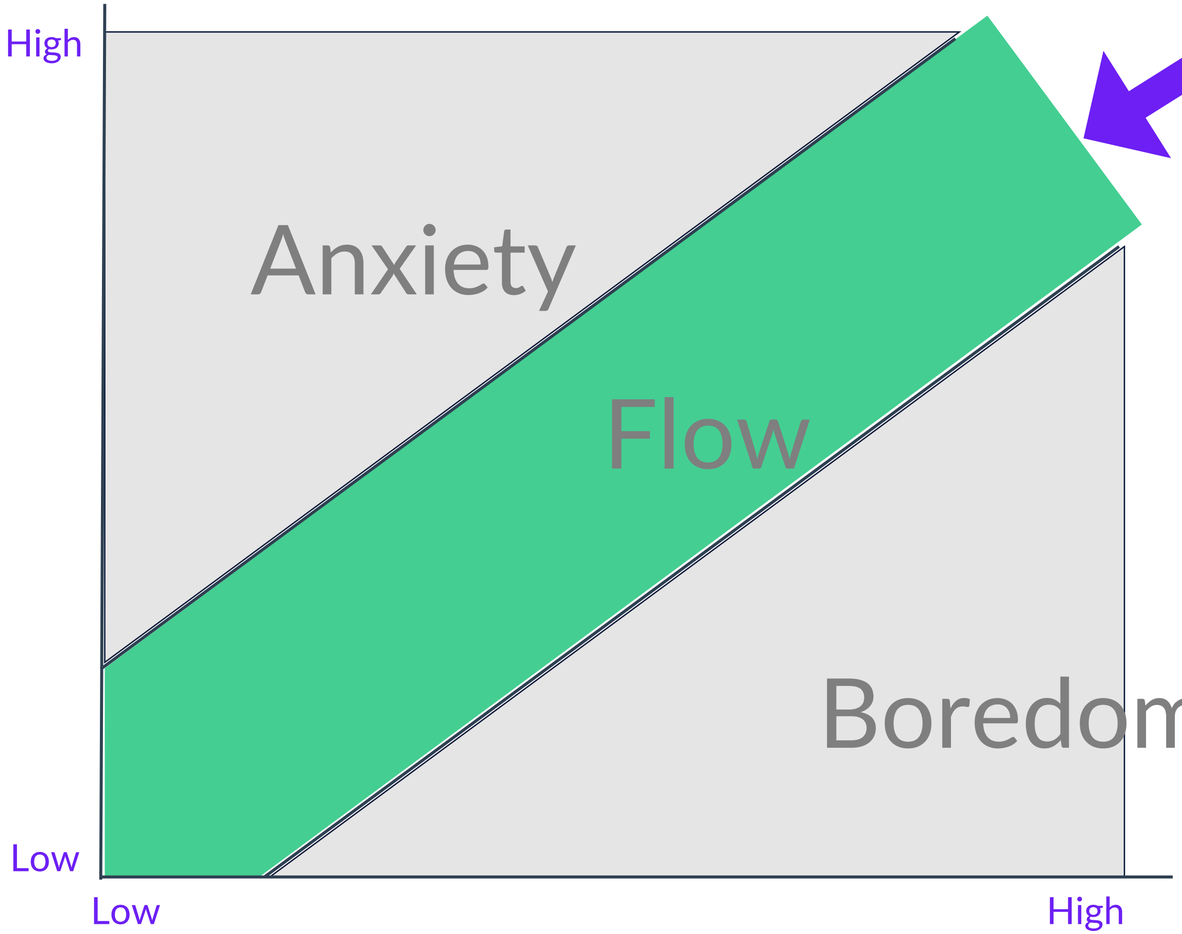
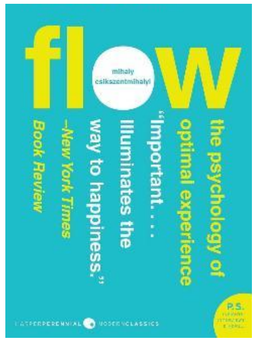
Task – participant-skills match: The ‘Flow’ Model

Challenge / Task difficulty



The sweet spot / channel = flow

Skill level



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Csikszentmihalyi, 2008: Flow

Tools and Resources

- Trainings and resources: EU-citizen.science https://eu-citizen.science/
- Platform: Citizen Science Project Builder (PB) web-based tool that allows researchers, students, and all members of the public to create and run data-analysis Citizen Science projects. The PB provides an interface that requires limited technical knowledge, and ideally little or no coding skills. has been developed by the Citizen Science Center in Zurich in collaboration with the Citizen Cyberlab at University of Geneva. https://lab.citizenscience.ch/en/about
- Platform: ECSA

Table 21.1 Classification of types of citizen science guidelines

Type	Subtype	Topic	Examples
General – covering aspects common to all citizen science projects	All aspects		*Citizen Science for All. A Guide for Citizen Science Practitioners* (GEWISS Consortium 2016)
			Ciencia ciudadana: Principios, herramientas, proyectos de Medio Ambiente (Acevedo 2018)
	Focused on certain aspects	Ethics	*Managing Intellectual Property Rights in Citizen Science. A Guide for Researchers and Citizen Scientists* (Scassa and Chung 2015)
		Communication	*A Guide to Communications in Citizen Science* (Veeckman et al. 2019)
		Data	*Guiding Principles for Public Engagement* (UCL n.d.).
		Methodology	*Data Management Principles* (UKEOF n.d.)
			Citizen's Guide to Open Data (Geothink 2016)
			'Statistical Solutions for Error and Bias in Global Citizen Science Datasets' (Bird et al. 2014)
Specific – related to one project	All aspects		*Artportalen Basic Principles* (Artportalen n.d.)
			Manual de Usuario/a de Biodiversidad Virtual (Biodiversidad Virtual Manual) (Biodiversidad Virtual 2014)
	Focused on certain aspects	Ethics	*Debian Code of Conduct* (Debian n.d.)
			Código ético de la fotografía en la naturaleza (Ethical Code) (Biodiversidad Virtual n.d.)
		Methodology	Tutorial on the protocol for capturing an insect properly (Mosquito Alert n.d.).
			Celebrate Urban Birds (Cornell Lab n.d.)
			Unidad didáctica OdourCollect (Ibercivis 2019)
		Science	Tutorial on Galaxy Zoo (Galaxy Zoo n.d.)

Citizen Science: Key Takeav

- Good Science – Contributes valuable insights but requires validation.
- Impactful Science – Helps address real-world challenges and informs decisions.
- Science Better Linked to Society – Engages communities, fosters participation, and bridges the gap between research and everyday life.
- Takes Time & Effort – Needs careful planning, training, and data quality control.
- Influences Policy & Innovation – Can drive change when data is credible.

https://theoryandpractice.citizenscienceassociation.org/articles/10.5334/cstp.572

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EXTRA

Gamification

Gamification and Games by Design

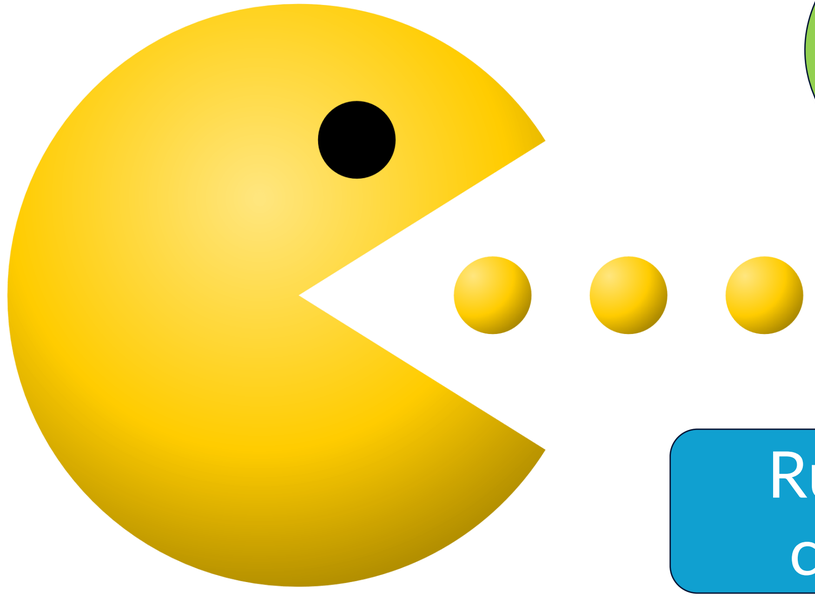
A good co-creation is similar to playing

«A voluntary, bounded activity separate from real life, governed by rules, and characterized by make-believe or uncertainty»

Roger Callois (1913 – 1978) - I giochi e gli uomini: La maschera e la vertigine

Suspension of disbelief

Willingness



Challenge and Fun

Rules that create a social contract for interaction

Feedback

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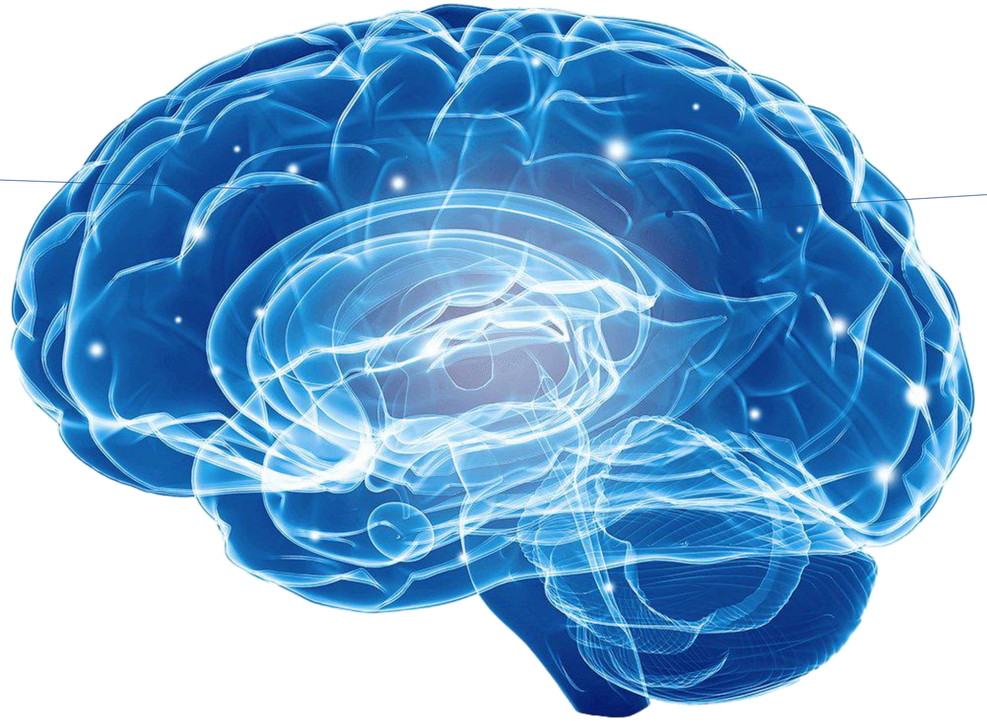
STRESS



LUDIC STRESS (EUSTRESS)

AN EFFECTIVE «GAME» MUST BE FUN AND REINFORCE OUR WILLING PARTICIPATION

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Gamification? A real methodology…

Mixing fun with a serious and rational context

Gamification is the process to borrow experiential and entertainment mechanics from gaming and ***applying them in non-gaming contexts***

Game mechanics must bring "vertigo" to the engagement process, *providing stimuli to the end users, allowing them to develop increasing competence and perceive the importance of his time investment while having fun.*

An effectively gamified process is configured as ***a good adventure story****: engaging and leading the "protagonist"* ***to feel capable of achieving objectives*** *through freedom of action, within certain rules and in a defined space.*

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Course Evaluation:

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And thank you!

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CONTATTI

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