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Assessing the impact of CS projects

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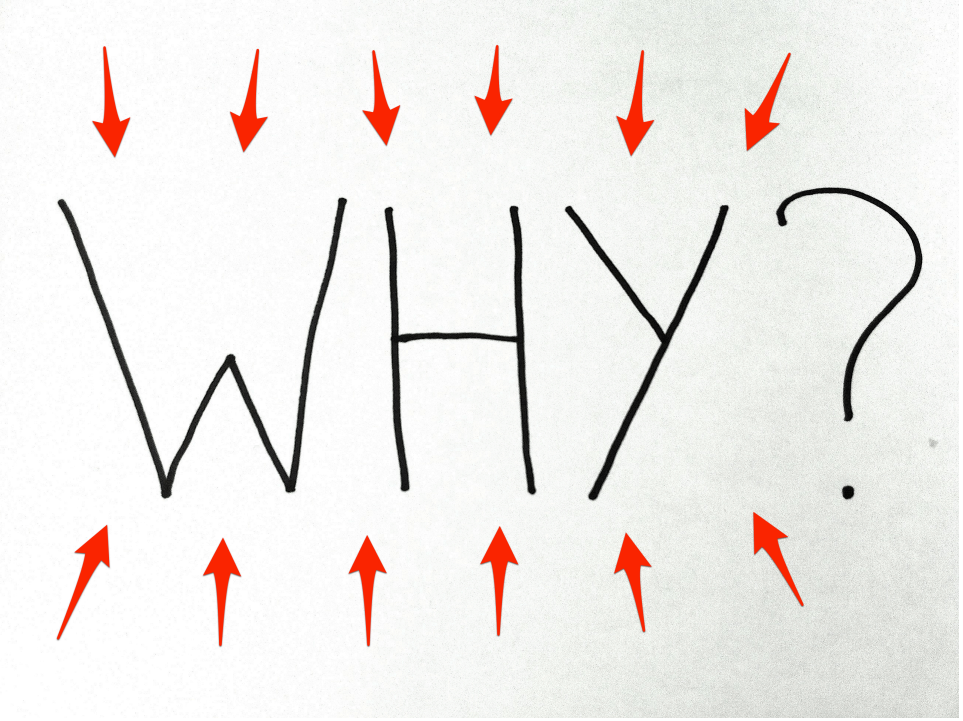
What is impact assessment?

Dealing with impact assessment, means answering questions such as:

- ✓ What is the difference a project makes?
- ✓For whom?
- ✓How can it be measured or described?

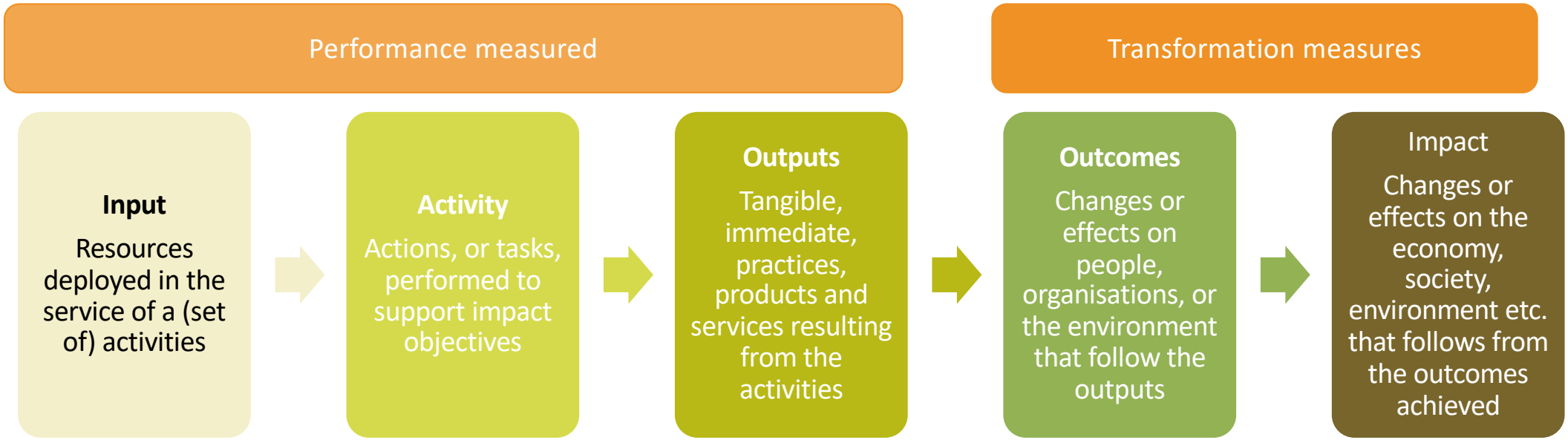
Why impact assessment?

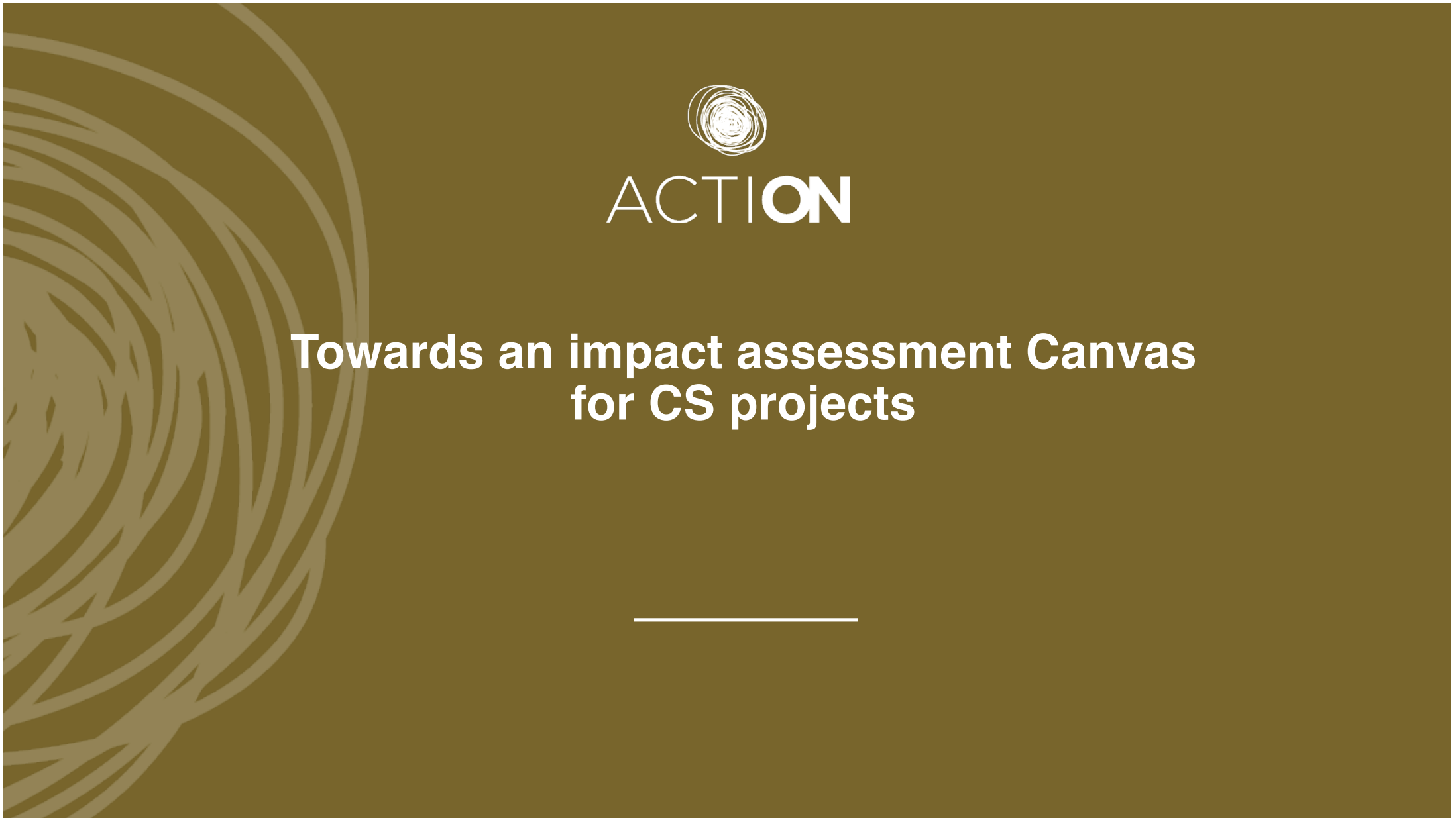


The overall goal of impact assessment is to bring about a more ecologically, socio-culturally and economically sustainable and equitable environment.

- For evaluating and improving your activities
- For maximising positive impacts and minimize negative impacts
- For influencing policies and programmes
- For better inform your stakeholders on your project's achievements

How does it work?





Towards an impact assessment Canvas for CS projects

How is the impact assessment canvas structured?

The impact assessment canvas is a four pages document.

- In the first two pages you will find some questions to be answered with some text. They are meant to support you in thinking about your project in terms of expected/desired transformations for you and your stakeholders
- The third and forth pages presents the areas of impact we, as the ACTION impact assessment team, think could be of relevance for CS projects. We kindly ask you to rate their relevance for your project.

In the next slides you will find definitions of the topics presented in the canvas so to be able to better fill it in.

In case you need any support or clarification please do not hesitate to get in touch with us. Email addressed are available in the last slide of this presentation.

Key problem you want to address

What social, economic, environmental problem are you trying to (contribute) to solve?

Example: Air pollution, especially that generate by private mobility, in Turin (Italy)

Key research question

What is the main research question addressed by your CS project?

Example: how does the private mobility traffic impact on air quality in specific areas of the city and in specific moment of the day?

Project stakeholders

Key stakeholders

Who will be touched by your project? Who will be engaged? Who can be interested in the results of your project?

Researchers
Representing which disciplines? Junior or senior?

Citizen scientists
Do you foreseen engaging any specific social group? Is your project working towards inclusiveness? What is the gender distribution in your group of citizens: female/male/not disclosed/other?

Other organisations
Will you collaborate with other organisation? What kind of organisation can benefit from project's activities/results?

Business actors
Will you collaborate with business actors? Would they be interested in exploiting your project's outputs?

General public
Do you foreseen to reach local, national or international public?

Policy/decision makers
Are you targeting local/national or international policy/decision makers?

Input	Activities	Outputs	Short terms and long terms impacts
• Where are you starting from? • What was there before the beginning of the project? • What are the economic/technical and human resource you will use? How much do they cost? *Example: this project is the continuation of a previous one, we have already 200 CS engaged and 5 lead researchers*	• What will you do? • What do you do to engage your stakeholders? • Can you define your project accordingly to the following categorisation?* *Example: Air quality monitoring with low cost DIY sensors. 5 events. 3 training workshops.*	• What are the tangible results you expect to deliver? • How many persons you aim to engage? • How many to reach though communication? • How many policy makers? *Example: a new version of our air quality measurement sensor; a curated dataset; 3 publications. 500 CS engaged. 1k reached*	• What positive change do you expect for your stakeholders? • Which areas of impact are more relevant? (see ACTION impact assessment framework) • Which dimensions? *Example: citizens will be more aware of air quality, better informed on how to reduce exposure, 10% will change their moving behaviours. Policy makers will change mobility policies. Papers deeply up taken by researchers in the field.*

ACTION impact assessment framework

Scientific impact

This dimension considers how the project can influence scientists and research organisations

Dimensions

- Scientific knowledge
- New research fields and interdisciplinarity
- New knowledge resources
- Innovation in education

Social impact

This dimension considers how CS can support community creation, empowerment and inclusiveness, the acquisition of new knowledge and skills by participants and how this can influence way of thinking and behaviours

Dimensions

- Community building and empowerment
- Social inclusion
- Researchers and research community growth and empowerment
- Knowledge, skills and competences
- Changes in way of thinking, attitude and values
- Behavioural change

Economic impact

This dimension explores if and to what extent CS can have a positive impact on CS leaders' organisations and participants in terms of employment, cost saving and financial empowerment of local communities.

Dimensions

- Impact on employment
- Cost saving
- Income and revenue generation for leading organisations
- Economic impact on the local communities

Political impact

This dimension investigates if the participation in CS projects increases citizen's civic and political participation beyond the project boundaries and if the project is able to influence the policy agenda and stimulate new and/or better policies

Dimensions

- Impact on policy process
- Political participation
- Self-governance
- Political support for citizen science

Environmental impact

This dimension considers how the project can contribute to the conservation of natural assets and support pollution reduction

Dimensions

- Impact on ecosystem
- Impact on biodiversity
- Impact on soil quality
- Impact on water quality
- Impact on air quality
- Impact on health

Scientific impact

- *This dimension considers to what extent the citizen science project produces new knowledge and can influence scientists and research organisations. Partly, this is an evaluation by traditional academic standards, such as the generation of scientific knowledge, captured in publications and possibly leading to new projects. Also, this dimension assesses the project impact on institutional or organizational structures, for example by creating new research fields, stimulating interdisciplinarity, or facilitating innovation in education. Furthermore, it assesses new forms of integrating traditional and local knowledge, thereby facilitating true knowledge exchange between science and society.*

Dimensions

- *Scientific knowledge*

To what degree do you expect to contribute to developing scientific knowledge? This can be in the form of datasets or other resources that can be used by the scientific community, publications in academic journals, publications on research platforms, etc. Other factors that are important to consider are the visibility, quality and openness of the scientific knowledge produced, as well as the recognition of volunteers' efforts.

- *New research fields and interdisciplinarity*

To what extent do you expect to contribute to forming new research fields and structures? For example, your project could bring different disciplines together by being highly interdisciplinary, create new research groups, or create a sub-discipline.

- *New knowledge resources*

To what degree does the project create or disclose new knowledge resources? For example, does it ease access to traditional and local knowledge resources, facilitate knowledge creation among societal actors and groups (such as researchers), or develop new data gathering tools?

- *Innovation in education*

To what extent do you expect to contribute to innovation in academic education? This could be in the form of innovation in student curricula or creating novel educational or training methods.

Social impact

This dimension looks at how the project influence citizens' opinions, attitudes and behaviours, what they learn from the project and how the participation enhance citizens' researchers' and community' empowerment and inclusiveness.

Dimensions

- *Citizens and communities empowerment*

To what extend citizens participating in the project will be supported in increasing their social links within the local community, to bridge toward other social groups and to improve the quality of their social relationships? will they increase the perception of their self-efficacy, which is the sense of being able to make a difference thought our actions?

- *Social inclusion*

To what extent the project will contribute to reduce social exclusion at local level by engaging people belonging to category marginalised or at risk of social exclusion such as people belonging to minorities, low income families, elders, people with disabilities, etc? Is the project working towards diversity engaging people of different age, social and cultural background, educational level, etc?

- *Researchers and research community growth and empowerment*

To what extend the project helps researchers in enlarging their collaboration network? In developing their research path and in acquire new competences?

- *Changes in way of thinking, attitude and values*

To what degree the project will support citizens in challenge and change their opinion on specific topics (i.e. air pollution), on environmental–related topics (such as climate change, for example) or toward science? To what extent will increase participants' awareness towards defined issues?

- *Behavioural change*

Will the project promote change in everyday life habits? To what extent it will be possible to see difference in the way people act, for example by adoption more pro-environmental practices or more sustainable behaviours?

- *Knowledge, skills and competences*

To what extent participants will be access new knowledge or acquire new competences in relation to the topic covered by the CS project? Will they acquire other skills to (for example soft skills)?

Economic impact

This dimension explores if and to what extent CS can have a positive impact on CS leaders' organisations and participants in terms of employment, cost saving and financial empowerment of local communities.

Dimensions

- *Job creation*

To what expect is it possible to expect the project to positively impact the project team/organisation by increasing the number of employees/collaborators?

- *Cost saving for project stakeholders*

To what extent does the project produce cost or time saving for local stakeholders, for example the municipality or the research community, by carrying out activities that would be otherwise more expensive or impossible to perform?

- *Income and revenue generation*

Will the project generate an income for the organisations involved or for the volunteers? It is developing a product or service that will be delivered to the market in the future? Is the project able to attract additional funding?

- *Economic impact on the local community*

To what extent will the project will have a positive economic (monetary or not) impact on the local community? For example, will the project improve the attractiveness of the place in which it takes place? Will it promote new economic activities for residents?

Political impact 1

This dimension investigates if the project is able to influence political processes. This includes an evaluation about whether the contents of the project are incorporated into political decisions, including motivations and rationales for political action, priority setting, policy design, implementation and assessment. This dimension also considers if the project empowers citizens to participate in policy-relevant debates and decision-making processes, and if citizens take up local self-governance to address real world problems. It is also about political support for citizen science itself.

Dimensions

- *Impact on policy processes*

To what degree do you expect to contribute to policy processes? This can be in the form of new or changed policies (e.g. regulatory, management or conservation actions) and new policy discourses and agendas. It can also be that you provide inputs for the monitoring and evaluation of policy implementation and to ensure enforcement and compliance.

- *Political participation*

To what extent do you expect to empower and activate members of the public to get involved in political processes? This can in the first instance relate to increasing political interest and trust, but also knowledge about how to become actively involved. It can also mean to promote engagement in political groups (e.g. party membership, work for candidates) and cause-oriented activities (e.g. membership in voluntary associations, taking part in demonstrations and protests, raising issues in the news media).

Political impact 2

Dimensions (continuing from the previous slide)

- *Self-governance*

To what extent do you expect your project to contribute to self-governance: local groups are self-managing environmental resources or design technologies to deal with real world problems? This can include the development of innovative ways to solve real world problems and that can be implemented by local people or communities without requiring policy involvement. Examples are for example the establishment of a code of conduct, novel decision-making procedures, or finding ways in which the external authorities do not need to be involved. This dimension is also about the active involvement of members of the public or interest groups for wider application of the examples.

- *Political support for citizen science*

To what extent do you expect your project to enhance political support for citizen science? This can include the creation of trust in, financial funding for, and knowledge about citizen science. It can also be the promotion of partnerships and platforms between government decision-makers and citizen science associations and organisations.

Environmental impact

This dimension considers how the project can contribute to the conservation of natural assets and support pollution reduction. This can be by directly reducing pollutants or emissions or by saving species. Alternatively, the project can have an indirect effect, by raising awareness, changing behaviours, supporting the development of new policies, or strengthening community participation in environmental issues.

Dimensions

- *Impact on ecosystem*

To what extent does your project (directly or indirectly) expect to reduce emissions such as methane, nitrous oxide, ammonia, CFC, CO2, sulfur hexafluoride and nitrogen trifluoride? Ways of doing this would be the promotion of everyday practices with a lower ecological footprint, or active carbon storage.

- *Impact on biodiversity*

Does your project expect to reduce the degradation of natural habitats, halt the loss of biodiversity or prevent the extinction of threatened species, either directly or indirectly?

- *Impact on soil quality*

To what extent do you expect to increase soil quality (directly or indirectly), by reducing pollution and contamination, and/or by increasing its buffer function, filter function, habitat function, or production function?

- *Impact on water quality*

To what extent does your project expect to increase water quality (directly or indirectly), by reducing pollution and contamination or by saving water usage?

Environmental impact

Dimensions (continuing from the previous slide)

- *Impact on air quality*

To what extent do you expect to increase air quality (directly or indirectly), by reducing pollution and contamination from for example fine dust, carbon monoxide, ozone, sulfur dioxide, nitrogen, dioxide?

- *Impact on health*

To what extent do you expect to increase people's health or prevent illness in ways that have not been captured in the previous sub-dimensions, for example by reducing noise pollution?

Transformative potential

This part of the assessment is not included in the canvas and will be discussed during dedicated online meetings. It is here as a reference for further exchanges.

To what extent does the project question, change or challenge (elements of) the dominant regime?

Regime: current structures and practices characterised by dominant rules, institutions and technologies that are self-reinforcing (Geels 2018)

Examples:

- Mobility system: cars
- Energy system: gas and oil
- Agriculture system: intensive farming
- Science system: universities

Niche: locus for radical innovations that challenge the dominant regime.

Examples:

- Bike sharing, public transport
- Renewables: wind, solar, etc
- Extensive farming, circular farming
- Citizen science

Transformative potential

How can I assess the transformative potential of my project? Is my project:

Radical?

- Does it “make the impossible possible”
- Does it “disrupt the norm”

Iconic?

- Does it have a “wow-effect”
- Does it have communicative, symbolic value?

Catalising?

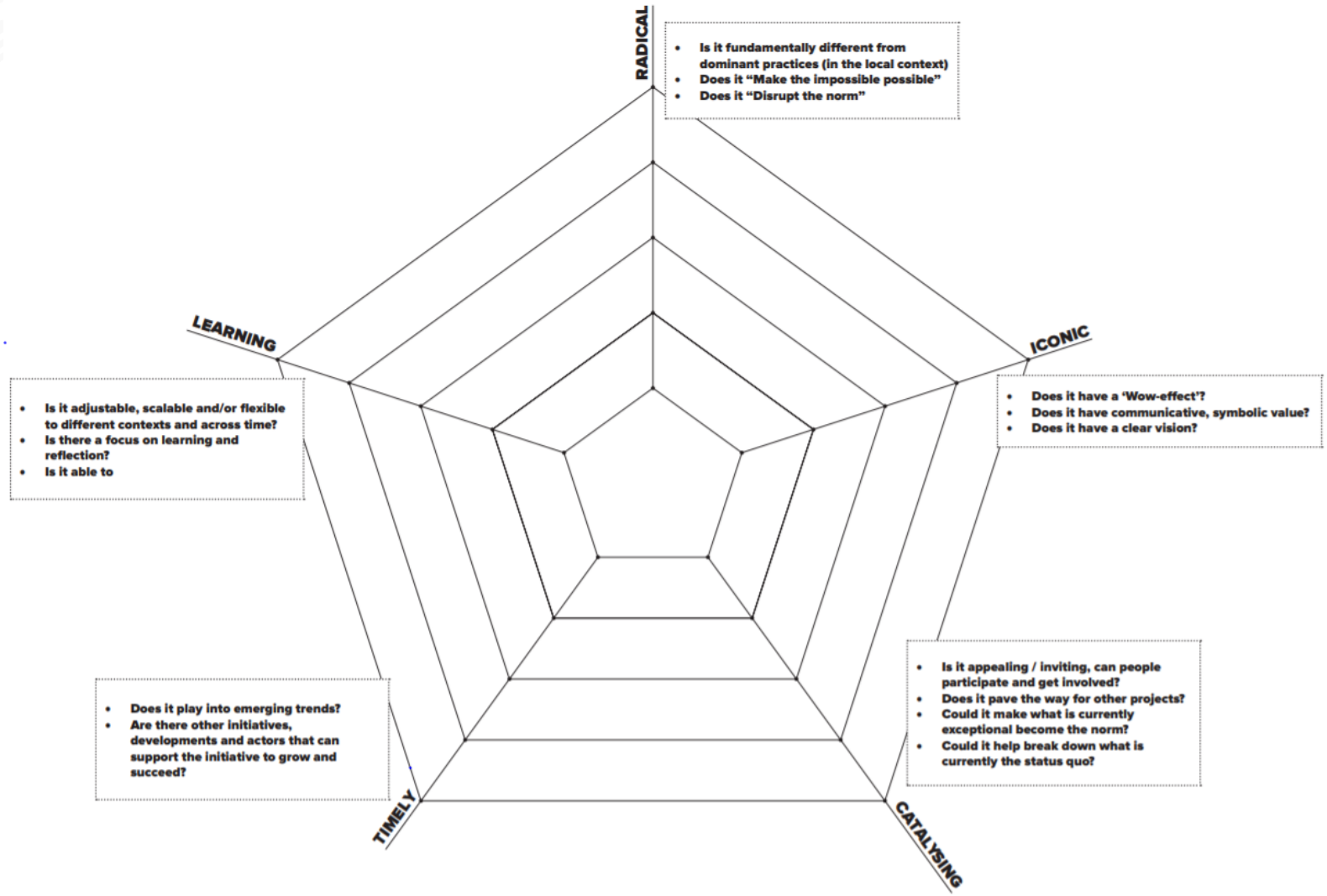
- Is it appealing/inviting, can people participate and get involved
- Does it pave the way for other projects

Timely?

- Does it play into emerging trends
- Other initiatives, developments and actors that can support the initiative to grow and change

Learning?

- Is it adjustable, scalable, and/or flexible to different contexts and across time
- Is there a focus on learning and reflection


RADICAL
Is it fundamentally different from dominant practices (in the local context)
Does it "Make the impossible possible"
Does it "Disrupt the norm"
ICONIC
Does it have a 'Wow-effect'?
Does it have communicative, symbolic value?
Does it have a clear vision?
CATALYSING
Is it appealing / inviting, can people participate and get involved?
Does it pave the way for other projects?
Could it make what is currently exceptional become the norm?
Could it help break down what is currently the status quo?
TIMELY
Does it play into emerging trends?
Are there other initiatives, developments and actors that can support the initiative to grow and succeed?
LEARNING
Is it adjustable, scalable and/or flexible to different contexts and across time?
Is there a focus on learning and reflection?
Is it able to

Research questions underline the impact assessment

- Which values (materialistic VS post-materialistic) characterise the citizen scientists?
- What is their attitude towards environment before entering one of our project? And how can CS influence them?
- What is their attitude towards science before entering one of our project? And how can CS influence them?
- Do they show pro-environmental behaviours before entering one of our project? Can CS influence them?
- What is their level of self-perceived efficacy in terms of pro-environmental behaviours?

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