

Overview impact assessment variables and associated respondents and timing of questionnaires

Scientific impact			
Variable	Repondent	Ex-ante	Ex-post
<i>Knowledge in academia</i>			
Quantity of new data created (No of datapoints)	manager	no	yes
Quality of data in datasets	manager	no	yes
Research outputs' compliance with FAIR principles of open data.	manager	no	yes
Research outputs visibility on social media and research platforms (Academia, Research.edu, etc)	manager	no	yes
Citizen scientists' participation and recognition in the scientific output.	manager	no	yes
N. of publications (scientific and non-scientific)	manager	no	yes
<i>New research fields and interdisciplinarity</i>			
Self-reported interdisciplinarity	manager	no	yes
N. of new research groups created	manager	no	yes
Sub-disciplines emerging	manager	no	yes
<i>New knowledge resources</i>			
	manager	no	yes
Ease access to knowledge that is otherwise hard to access	citizens	no	yes
	manager	no	yes
Facilitate knowledge creation among societal actors and groups	citizens	no	yes
Development of new data-gathering tools	manager	no	yes
<i>Innovation in (academic) education</i>			
Innovation in academic or school curricula	manager	no	yes
Innovation in (other) educational/training methods	manager	no	yes
Social Impact			
Variable	Repondent	Ex-ante	Ex-post
<i>Community building and empowerment</i>			
N. of citizens scientists engaged in project activities	manager	no	yes
Role of the citizen scientists in the participatory research process	manager	no	yes
N. of awereness level/dissemination events organised	manager	no	yes
N. of participants to organised events	manager	no	yes
N. of persons/organisation reached trough social media	manager	no	yes
Level of interaction among citizen scientist	manager	no	yes
Changes in bonding social capital among citizen scientists	citizens	no	yes
Changes in bridging social capital among citizen scientists	citizens	no	yes
Changes in linking social capital	manager	no	yes
N. of new social relations established	citizens	no	yes
Increase in the perceived quality of social relations	citizens	no	yes

Self-assessment on project capability to influence trust among participants	manager	no	yes
Project self-assessment of its capacity to foster the creations and the enlargement of local communities/groups	manager	no	yes
Improvement in the self-perceived efficacy of citizen scientists	citizens	no	yes
<i>Social Inclusion</i>			
Percentage of participants belonging to under represented social groups	manager	no	yes
Ration among age groups of participants	citizens	yes	yes
Male/female share among participants	citizens	yes	yes
Diversity of participants in terms of education level	citizens	yes	yes
Diversity of participants in terms of income	citizens	yes	yes
Diversity of participants in terms of cultural differences	citizens	yes	yes
Diversity of participants in terms of value orientation (materialistic/postmaterialistic)	citizens	yes	yes
Presence and description of a dedicated strategy for social inclusion and diversity management	manager	no	yes
<i>Researchers and research community growth and empowerment</i>			
N. of new collaborations established with other researchers/research organisations	manager	no	yes
N. of new collaborations established with other organisations (excluding research organisations)	manager	no	yes
Changes in researchers' carrier path	manager	no	yes
Changes in researchers's level of trust for citizens, other CS managers and decision-makers	manager	no	yes
<i>Knowledge, skills and competences</i>			
N. of CS projects in which participants have been enrolled/are enrolled	citizens	yes	yes
Probability to engage in CS projects in the future	citizens	no	yes
Participation in cause-oriented initiatives (see political impact)	citizens	yes	yes
N. of participants considering a scientific or environmental-related carrier as a result of the project (for student only)	citizens	no	yes
N. of participants considering enrolling in life-learning educational programm related to science or environmental studies (only for adults)	citizens	no	yes
Changes in the interest for the specific topic covered by the project	citizens	yes	yes
Changes in the interest for science related topics and activities	citizens	yes	yes
Changes in the understanding of the scientific method	citizens	yes	yes
Changes in the understanding of the scientific process	citizens	yes	yes
Acquisition of new skills in the research design-related activity	manager	no	yes
Acquisition of new skills in the data gathering- related activities	manager	no	yes
Acquisition of new skills in the data curation- related activities	manager	no	yes
Acquisition of new skills in the data analysis- related activities	manager	no	yes
Acquisition of new skills in the data interpretation- related activities	manager	no	yes
Acquisition of new skills in shaping and commenting results	manager	no	yes
Acquisition of new skills on impact assessment	manager	no	yes

Acquisition of new skills in communicating results	manager	no	yes
Acquisition of new skills in the valorization of project results for policy making	manager	no	yes
Acquisition of new skills on project sustainability	manager	no	yes
Increment in technological literacy	manager	no	yes
Acquisiation of new skills related to critical thinking	manager	no	yes
<i>Changes in way of thinking, attitude and values</i>			
Changes in way of tinkering related to the specifi topic of the project. Index to be selected/elaborated on a project-by-project base	citizens	yes	yes
Changes in way of thinking on enviromental issues/concerns (NEPS scale)	citizens	yes	yes
Changes in the way of thinking on science (MATOSS index)	citizens		
Changes at value level (post-materialistic index)	citizens	yes	yes
<i>Behavioural change</i>			
Impact on green consuption behaviours	citizens	yes	yes
Impact on project-specific related behaviours	citizens	yes	yes
Economic impact			
Variable	Repondent	Ex-ante	Ex-post
<i>Impact on employment</i>			
n. of new job places created within the leading organisation	manager	no	yes
n. of participants that change or get a new job as a results of the CS project	citizens	no	yes
<i>Cost saving</i>			
Average n. of hours dedicated to the project by volunteers	manager	no	yes
n. of hours dedicated to citizens' engagment and support	manager	no	yes
<i>Income and revenue generation</i>			
n. of new or improved product created	manager	no	yes
n. of new service created or improved	manager	no	yes
Revenue generated by each of the new or improved products	manager	no	yes
<i>Economic impact on the local commuity</i>			
To be elaborated on a project-by-project base			
Political impact			
Variable	Repondent	Ex-ante	Ex-post
<i>Impact on policy processes</i>			
N. of new/changed policies (e.g. regulatory, management or conservation actions)	manager	yes	yes
Agenda setting: n. of new policy discourses and problem definitions	manager	no	yes
Self-reported contribution to policy implementation and enforcement	manager	no	yes
Self-reported contribution to monitoring and evaluation of policy implementation	manager	no	yes

N. of meetings/conferences organised/attended for influencing policymakers	manager	no	yes
<i>Political participation</i>			
Political literacy: self-reported changes in the time spent by individuals in getting informed about political issues	manager	yes	yes
	citizens	yes	yes
Self-reported changes in engagement in political groups or activities (e.g. party membership, work for candidates, protesting, lobbying)	manager	yes	yes
	citizens	yes	yes
Self-reported changes in civic engagement (e.g. membership in voluntary associations, charities or environmental groups)	manager	yes	yes
	citizens	yes	yes
<i>Self-governance</i>			
Active involvement in or creation of self-managed spaces for DIY-science community projects	manager	yes	yes
	citizens	yes	yes
Active involvement in or creation of new civic society organisations and/or informal groups created at the local level	manager	yes	yes
	citizens	yes	yes
N. of political events (e.g. rallies) organised/attended for involving wider actors	manager	yes	yes
	citizens	yes	yes
<i>Political support for citizen science</i>			
Change in policy support and funding for citizen science	manager	yes	yes
N. of new partnerships between government decision-makers/policymakers and citizen science initiatives and organisations	manager	yes	yes
Environmental impact			
Variable	Repondent	Ex-ante	Ex-post
<i>Impact on ecosystem</i>			
Direct reduction emissions	manager	no	yes
Indirect reduction emissions	citizens	yes	yes
<i>Impact on biodiversity</i>			
Direct improvement biodiversity	manager	no	yes
Indirect improvement biodiversity	citizens	yes	yes
<i>Impact on soil quality</i>			
Direct improvement soil	manager	no	yes
Indirect improvement soil	citizens	yes	yes
<i>Impact on water quality</i>			
Direct improvement water	manager	no	yes
Indirect improvement water	citizens	yes	yes
<i>Impact on air quality</i>			
Direct improvement air quality	manager	no	yes
Indirect improvement air quality	citizens	yes	yes
<i>Impact on health</i>			
Direct influence health	manager	no	yes
Indirect influence health	citizens	yes	yes

Transformative impact			
	Repondent	Ex-ante	Ex-post
	manager	yes	yes